

Reducing Smoking Initiation Literature Review

A background discussion document
to support the national
Framework for Reducing Smoking Initiation
in Aotearoa-New Zealand

Prepared for the Ministry of Health
by the HSC (Health Sponsorship Council)

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FOREWORD

This literature review has been undertaken by the Health Sponsorship Council (HSC) with support from the Cancer Society of New Zealand, Smokefree Coalition and Apārangi Tautoko Auahi Kore (ATAK). It provides a background discussion document to support the development of a national Framework for Reducing Smoking Initiation in Aotearoa New Zealand. The document provides a review of effective interventions to reduce smoking initiation, with an emphasis on modifiable risk factors. The document should be read in the context of informing the national implementation plan to reduce the incidence of smoking initiation.

The HSC would like to thank Allen & Clarke Policy and Regulatory Specialists Ltd for writing most sections of this document. We thank the Cancer Society of New Zealand, Smokefree Coalition and ATAK for their support and contribution to the project. We also very much appreciate the guidance and input provided by the Reducing Smoking Initiation Review Committee.

Numerous researchers and providers have assisted us to identify and locate literature for this review, and we thank them for this.

PART ONE: OVERVIEW

In early 2004 the HSC undertook some preliminary work on a literature review of youth-focused anti-tobacco interventions. This preliminary work identified a need for a more co-ordinated and consistent approach to future youth tobacco control in Aotearoa New Zealand. In particular, the preliminary work identified the need to develop a national youth tobacco control plan.

The HSC, with support from the Cancer Society of New Zealand, Smokefree Coalition and ATAK was contracted by the Ministry of Health to undertake a literature review that would be used to inform the development of a national plan to reduce smoking initiation in New Zealand.

1. Reducing Smoking Initiation Review Committee

A Reducing Smoking Initiation Review Committee was convened to establish the parameters of the national plan to reduce smoking initiation, to provide guidance and feedback on the literature review, and to provide expert opinion/advice on how the literature review and other relevant issues should be translated into the national plan. The review committee is made up of a number of individuals with expertise in tobacco control (see Appendix B for full list of members).

2. Purpose of the literature review

The purpose of the literature review is to identify effective interventions to reduce smoking initiation, with an emphasis on modifiable risk factors. The literature review focuses on people aged five to 25 years of age. This information will then be used to inform the development of the national plan to reduce smoking initiation. The tobacco control community will be engaged on the draft plan to inform its future development.

3. Overview of the findings of this literature review and summary of key findings

This literature review has considered youth smoking prevalence rates in a number of countries, as well as risks, protective factors, and key interventions. The key findings from the risk and protective factors section have been applied to the key findings in the strategy section. This latter section discusses potential strategies that are likely to be effective given risk and prevalence factors in the New Zealand context. Where possible, it focuses on population groups.

4. Recommendations

Recommendations from this report have been set out in Part Seven.

5. Methodology

This section of the report describes the process of searching for and locating the literature that has been reviewed and analysed. This was developed in consultation with the Reducing Smoking Initiation Review Committee.

5.1 Categories of literature reviewed

The literature surveyed for this review can be categorised in the following ways.

Data about rates of smoking and smoking initiation among young people in comparable countries overseas. Countries included: Australia, Canada, the United Kingdom and the United States. The reviewers had up-to-date information about smoking rates in New Zealand, so there was no need to search for New Zealand data in this category.

Research about risk and protective factors for smoking initiation among young people. Risk and protective factors are the environmental, personal and social factors that can increase or lower the risk of a young person starting to smoke. In this search category there was a focus on robust research from peer-reviewed journals. New Zealand research was also sought.

Research and reports about interventions designed to reduce or delay smoking initiation among young people. As well as peer-reviewed literature, ideas that had not been subjected to academic research and evaluation were gathered. This included a scan of tobacco control magazines, education sector material and other non-academic literature.

5.2 Conduct of the literature search

The search undertaken to inform this review located literature via searches of national and international databases and references in significant documents. The search also involved personal contacts and a request broadcast through the Smokefree Coalition's fortnightly electronic newsletter on tobacco control issues. Some literature was also supplied by the HSC and by individuals.

Search terms

Search terms varied depending on the particular databases and the category of literature being searched. The terms can be broadly summarised into the following categories:

- tobacco/smoking/cigarettes
- drugs
- initiation
- prevention/delay
- adolescents/youth/teenagers/young adults

- risk factor/protective factor.

Databases searched

A search of several international and national electronic databases of literature was conducted.

The search covered:

- literature dealing with the prevention of uptake of smoking in young people
- international literature published since 1999, and published and unpublished New Zealand literature from 1995 onwards
- literature dealing with smoking initiation only – literature dealing with smoking cessation was excluded
- literature in English
- literature relating to high-risk groups in New Zealand. Māori, Pacific peoples, and Asian New Zealanders were a particular focus
- literature relating to New Zealand, Australia, the Pacific Islands, Canada, the United Kingdom, the United States and Asia.

The databases searched were MEDLINE, ERIC, EMBASE, PsycINFO, Cochrane Library, Cochrane Controlled Trials Register, Cochrane Database of Systematic Reviews, DARE, Social Science Citations Index, Science Citation Index, Current Contents, Dissertation Abstracts, INNZ, and Te Puna. This list is set out in Appendix A with a description of the scope of each database. The searches were carried out by staff at the Wellington School of Medicine and Wellington City Libraries.

The following searches were also conducted.

- A search of publications held by/published by ALAC and SHORE, using their websites and the ALAC information staff.
- A search of the Internet using advanced searching techniques. This search covered key agencies involved in tobacco control including the Smokefree Coalition, NZ Drug Foundation, ASH (NZ), ASH (UK) and New Zealand, Australian, Canadian and other government agencies (Ministries of Health and Education and agencies set up specifically to tackle smoking among young people).
- A search of recent issues of the following periodicals: *Tobacco Control*, *Health Promotion Journal of Australia*, *Drug and Alcohol Review*, *Health Promotion International*, *Addiction*, *International Journal of Drug Policy*, *Journal of Primary Prevention*, *Health Education Quarterly*, *Drug and Alcohol Findings*, *Substance Use and Misuse*, *Tobacco and Health*, *Journal of Alcohol and Drug Education*.
- A review of the bibliographies of recent key publications.

The initial search uncovered more than 2,500 articles, which were reduced to 500 and then to 150.

Priority was given to articles that met one or more of the following criterion:

- most recent articles
- studies that used larger samples
- longitudinal studies
- key New Zealand studies
- significant overseas reviews
- evidence of reliable evaluation methodology
- meta-analysis and literature reviews.

Subsequently, review committee members recommended inclusion of a further approximately 80 articles and studies that they were aware of and considered pivotal. These were included where possible within the extended timeframe for completion of the review.

PART TWO: PATTERNS OF YOUTH SMOKING

1. Background

Tobacco use has been identified as a major preventable cause of premature death and illness (Conrad K, et al, 1992; Peto R & Lopez A, 2001). Each year it is estimated that between 4,300 and 4,700 people die in New Zealand from tobacco-related illness (Ministry of Health, 2002) and around 350 further deaths are attributable to second-hand smoke¹ (SHS) exposure (Woodward A & Laugesen M, 2001). Higher smoking prevalence is positively associated with increased social and economic deprivation as well as Māori and Pacific peoples ethnic identification (Ministry of Health, 2001). Nearly half of the adult Māori population report smoking compared to under a quarter of those who identify as European/Pakeha (Ministry of Health, 1999).

Higher smoking prevalence is seen as contributing to higher rates of morbidity and mortality among Māori. Māori females, in particular, share a disproportionate burden of smoking-related morbidity and mortality and they suffer lung cancer rates that are among the highest in the world (Durie M, 1994).

Disproportionate health impacts from smoking are common among indigenous people in developed countries. The prevalence of conventional cardiovascular risk factors such as smoking can explain, in part, the difference between life spans of indigenous and non-indigenous peoples. Among Australian Aboriginal and Torres Strait Islander populations cardiovascular disease is the single most common cause of premature death and disability and smoking is the principal health behaviour that leads to their life span being nearly 20 years less than other Australians (Lindorff K, 2002). This compares to a five- to six-year difference in New Zealand between Māori and Non-Māori, a seven-year gap in Canada between indigenous and non-indigenous peoples and 3.5 years in the United States between indigenous North Americans and others (Lindorff K, 2002).

In New Zealand, both government and non-government organisations have employed multiple approaches to reduce smoking prevalence. These include mandatory packet warnings, price increases, a ban on tobacco advertising, smokefree environment legislation, health education, the provision of quit programmes, and litigation against the tobacco industry (Crane J, et al, 2004). This combined approach to tobacco control has been attributed to a decline in smoking prevalence over the past 30 years. However, in the last decade this decrease has slowed (Ministry of Health, 2002) despite an increase in resources being committed to tobacco control and, in particular, to smoking cessation programmes since 1996 (Price L & Allen M, 2003). Similar patterns have occurred in other developed countries. A possible explanation is given by Warren and colleagues

¹ Second hand smoke (SHS) is also referred to as environmental tobacco smoke and is the combination of side stream smoke, or smoke that is emitted between the puffs of burning tobacco (cigarettes, pipes, or cigars), and mainstream smoke, smoke that is exhaled by the smoker (National Cancer Institute, 2003). In New Zealand it is commonly referred to as second-hand smoke and is abbreviated to SHS. This abbreviation will be used for the remainder of the report.

(Ministry of Health, 2002) who have suggested that a reason why adult smoking prevalence has not markedly declined in OECD countries in recent years is due to adults who quit smoking being replaced by younger people taking up the habit.

Smoking uptake usually occurs during adolescence, while the vast majority of smoking-related deaths occur in middle-aged and elderly people. The longer the onset of smoking is delayed, the less likely a person is to become addicted (Surgeon General, 1994). Young people who smoke may acquire the habit and become addicted before reaching adulthood, making them less able to quit smoking and more likely to have a tobacco-related health problem.

Smoking experimentation remains a consistent characteristic of adolescence and as a young person moves through this period the likelihood of smoking increases (McCool J, Cameron L, Petrie K, et al, 2003). Tobacco use among adolescents is a critical indicator not only of the initiation of tobacco use, but of future trends in tobacco addiction and tobacco-related disease in adults. Smoking initiation usually occurs during pre-adolescence and those who become daily smokers usually do so before the end of adolescence (NFO CM Research, 2001a; NFO CM Research 2001b; Stanton W, et al, 1989; Surgeon General, 1994). To further reduce smoking prevalence, tobacco control efforts need to address smoking initiation.

The transition from being a non-smoker to becoming an addicted smoker is viewed as a process rather than a singular event. This process is generally seen as occurring over five stages; preparatory, trying, experimental, regular, and finally addicted/dependent smoker phases. For those who become addicted smokers, progression through these stages is seen to occur over a two-to-three-year period, regardless of age (Ling P & Glantz S, 2002).

The first, preparatory, stage is where prospective smokers form attitudes and beliefs about the utility of smoking and advertising. The second, trying, stage is characterised by the person smoking a few cigarettes. The third stage is experimental where the person smokes repeatedly but irregularly. During the fourth, regular, stage the person moves into regular use of cigarettes, where they are smoking at least weekly, across a variety of situations and personal interactions. The final, addicted/dependent, stage is the move to become a dependent or addicted smoker; at this point the person has developed the physiological need for nicotine (Ling P & Glantz S, 2002).

It has been suggested that the tobacco industry has capitalised on developmental issues and stages of uptake to increase use of their products. For example, tobacco marketing has been designed to 'cultivate' smokers throughout the process of smoking initiation (Ling P & Glantz S, 2002). Young adults are seen as particularly important to the industry for several reasons. Firstly, the progression from 'experimenter' to 'mature smoker' is accompanied by an increase in consumption (Johnston M, et al, 1981). Secondly, as part of the developmental process, young adults face multiple life transitions that provide opportunities for adoption and solidification of smoking as a regular part of

new activities (Harden J, 1984). Thirdly, the stresses of these life transitions invite the use of cigarettes for the drug effects of nicotine (Harden J, 1984).

As well as focusing on New Zealand literature, this review refers to smoking prevalence in America, Australia, Canada, Europe, the Western Pacific, and the United Kingdom. These countries and geographical regions were chosen as they were seen to have tobacco control legislation and public health measures that were comparable to those taking place in, or are in the geographical vicinity of, New Zealand. A number of these countries also have indigenous peoples who have had similar experiences of colonisation to Māori. This allows for a level of comparison between Māori and other indigenous peoples.

In general, information in the following sub-sections has been prioritised and reported according to overall prevalence and trends, smoking by sex, smoking by ethnic group and smoking by age group. Unless otherwise stated ‘daily smoking’ refers to people who smoke at least one cigarette a day, ‘current smoking’ to those people who smoke at least once a month, ‘ever smoked’ to people who have ever tried a cigarette, even a few puffs, and ‘never smoked’ to those people who have never tried smoking. In general people who were the first or native inhabitants of a country or region are referred to as ‘indigenous’ except where an actual tribal name or accepted proper noun for that group is given (eg, Māori).

2. Country summary overview

Tobacco use is one of the chief preventable causes of death globally (Peto R & Lopez A, 2001). The World Health Organization (WHO) attributes 4.9 million deaths a year to tobacco use, a figure expected to rise to more than 10 million deaths a year by 2030 (Peto R & Lopez A, 2001).

Smoking initiation among young people is a common issue for most countries worldwide. However, there is great variation both between and within nations. The highest reported youth smoking rates can be found in Central and Eastern Europe, sections of India, and some of the Western Pacific Islands (Mackay J & Eriksen M, 2002).

At the beginning of the 21st century nearly 20 percent of 13 to 15 year olds worldwide used some type of tobacco product² (Peto R & Lopez A, 2001). Although cigarettes continue to be the primary form of tobacco used by young people, other tobacco products such as spit tobacco (chewing tobacco or snuff), bidis and water pipes are also used (see Appendix C for definitions).

The WHO reports that daily smoking rates throughout the world increase substantially across age groups (WHO, 2000). For example, in 2000 no country exceeded a daily smoking rate of two percent for 11 year olds, while most countries had around 10 percent daily smokers at age 13 and nearly 30 percent daily smokers at age 15.

² Smoked or used tobacco products on at least one day of the previous 30 days.

Since the late 1990s the WHO, in association with the US Centers for Disease Control and Prevention (CDC), has promoted the adoption of the Global Youth Tobacco Survey (GYTS). An aim of this survey is to produce country level youth smoking data that is consistent and comparable internationally. At the time of writing this report, 76 countries had implemented the GYTS. Under the WHO, countries are divided into six regions - African Region, Americas Region, Southeast Asia Region, European Region, Eastern Mediterranean Region, and the Western Pacific Region. The following table lists the prevalence of tobacco use (smoked or used tobacco products on at least one of the 30 days preceding the survey) by sex, based on available GYTS data in these regions.

The table is generally organised by WHO health regions, with the addition of New Zealand as a specific country.

Table 1. Percentage of students aged 13-15 who used tobacco at least once a month - Global Youth Survey, 1999-2002 (Global Youth Tobacco Survey Collaborating Group, 2003)

Region	Boys currently ³ smoke cigarettes	Boys currently use other tobacco products	Girls currently smoke cigarettes	Girls currently use other tobacco products
Africa	15.0	10.9	6.6	7.4
America	16.6	10.2	12.2	6.4
Eastern Mediterranean	22.8	13.7	5.3	7.1
Europe	33.9	10.4	29.0	5.3
Southeast Asia	13.5	10.8	3.2	8.4
Western Pacific	11.0	10.5	6.4	6.2
New Zealand	18.9	-	26.9	-

2.1 The United States of America

Youth aged between 14 and 18⁴ years make up 90 percent of all new smokers in the United States. Every day in the United States more than 3000 youth aged between 14 and 18 years become new daily smokers. It has been estimated that roughly one third of these people will die prematurely from smoking-related illness (Asian Pacific partners for empowerment and leadership, 2004).

The American National Youth Risk Behaviour Survey (YRBS) reported that students aged 14 to 18 years showed an increase in current smoking prevalence from 1991 (27.5 percent) to 1997 (36.4 percent). A decrease in current smoking prevalence among students aged 14 to 18 years has been observed since 1997, with 34.8 percent in 1999, 28.5 percent in 2001, and 21.9 percent in 2003 (CDC, 2003c). In the 2003 YRBS, 16

³ Smoked cigarettes or used other tobacco products on one or more of the 30 days preceding the survey

⁴ Grade 9-12 students.

percent of students aged 14 to 18 years reported smoking cigarettes at least once a day (CDC, 2003c).

Smoking by sex

Data from the 2003 YRBS found that proportions of males and females that had ever smoked were similar with 58 percent of females and 58⁵ percent of males reporting ever using tobacco. Similar to ‘ever use’, proportions of reported current use were similar between the sexes with 22 percent of females and 22 percent of males reporting current use (CDC, 2003a).

Smoking among ethnic groups

Data from the 2003 YRBS indicates that the prevalence of smoking among ‘other’⁶ students was higher than African American and Hispanic students (CDC, 2003c). Twenty-seven percent of ‘other’ females aged 14 to 18 years reported current smoking and 21 percent reported daily smoking. These rates were higher than those found for Hispanic females of the same age of whom 18 percent reported current smoking and 11 percent reported daily smoking. The smoking prevalence among African American females aged 14 to 18 years was lower with 11 percent reporting current smoking and five percent reporting daily smoking (CDC, 2003b). In 2003 similar trends were seen for males with ‘other’ males smoking more than African American and Hispanic males, aged 14 to 18 years. Twenty-one percent of ‘other’ males reported current smoking and 17 percent reported daily smoking, 19 percent of African American males reported current smoking and 11 percent reported daily smoking, while 19 percent of Hispanic males reported current smoking and 12 percent reported daily smoking (CDC, 2003c). There were no ethnic differences seen in middle schools, with six percent of students reporting daily smoking (American Legacy Foundation, 2004).

Reviews of tobacco industry documents suggest that Asian-American and Pacific communities have been specifically targeted by the tobacco industry since the early 1980s. This targeting has been associated with a seven-fold increase in the smoking rates of Asian-American students aged 12 to 18 years. Recently it was reported that more than 25 percent of female Hawaiian/Pacific youth smoked during middle school, which was almost twice the smoking rate for Hawaiian/Pacific males (16 percent) (Asian Pacific partners for empowerment and leadership, 2004).

The National Youth Tobacco Survey (NYTS) reported that ethnicity played a distinct role in the determination of certain tobacco product use (American Legacy Foundation, 2004). Although cigarettes continue to be the primary form of tobacco used by young people in the United States other tobacco products used include bidis, snuff, and water bombs (see Appendix C for definitions). Therefore, measures of smoking prevalence may not be a

⁵ Differences between male and female ‘ever smoking’ have been obscured due to figures being rounded to whole numbers.

⁶ In this context ‘other’ refers to those students who did not identify as African American, Hispanic, Asian, Pacific Island or Indigenous.

true reflection of total tobacco products consumed among some ethnic groups and indigenous people.

Smoking among indigenous youth

Among seniors in high school, indigenous North Americans had higher rates of tobacco use than non-indigenous youth (Wallace J, et al, 2002). From 1996 through 2000, current smoking among indigenous North Americans aged 17 to 18 years was estimated to be 46 percent (Wallace J, et al, 2002). In a report produced by the CDC (CDC, 2004) and based on survey data between 1999 and 2001 it was found that 30 percent of male and 26 percent of female indigenous North American and indigenous Alaskans aged 12 to 17 years reported being current smokers.

Smoking by age

Consistent with international trends, high school students aged 14 to 18 years in the United States were more likely to report current smoking than middle school students, aged 11 to 13 years; and males were more likely to smoke than females in both middle and high schools (American Legacy Foundation, 2004). The prevalence of daily smoking⁷ was higher among high school students (11 percent) than middle school students (three percent). Daily smokers smoked an average of 10 cigarettes a day in middle school and nine cigarettes per day in high school. Asian-American and African-American daily smokers reported smoking more cigarettes in middle school than in high school (American Legacy Foundation, 2004).

2.2 Canada

According to the 2002 Canadian Youth Smoking Survey (YSS), 25 percent of youth aged 10 to 14 years reported ever trying any tobacco product, compared to 42 percent in 1994 (Health Canada, 2002). Smoking cigarettes was the most common form of trying tobacco.

Canadian Youth Smoking Survey (Health Canada, 2002) results indicate a significant and large increase (6.5 percent) in current smoking prevalence for 15 to 19 year olds between 1991 and 1994. However, since 1994 there has been no significant change in youth current smoking prevalence in Canada (Gilmore J, 2000).

Recent surveys indicate that prevalence may be decreasing. Smoking rates measured by the 2002 Canadian Tobacco Use Monitoring Survey (CTUMS) suggest that 22 percent of Canadian youth aged between 15 and 19 years were currently smoking. The following survey indicated that 18 percent of this group were currently smoking (Health Canada, 2003). Eleven percent of youth in the 2003 survey reported daily smoking and seven percent reported occasional smoking.

⁷ Current smokers in the NYTS who reported smoking on more than 20 days in the past 30 days in this report have been defined as daily smokers.

Smoking by sex

In 2000/01 Statistics Canada reported that just over two percent of males aged 12 to 14 years reported daily smoking compared to 3.8 percent of females of the same age group. These figures rose to 17.7 percent by 15 to 19 years of age for males and 18.9 percent for females (Statistics Canada, 2002b).

Smoking among indigenous youth

A report published in 1990 (Millar W, 1990) on smoking prevalence in the Canadian Arctic found that by age 19, 71 percent of Inuit (indigenous) youth were current smokers compared to 63 percent of Dene/Metis (indigenous) youth and 43 percent of non-indigenous youth. Within each ethnic group, the general pattern of higher smoking rates among females in almost all age groups was apparent. Inuit females (15 to 19 years old) had the highest rates, with 77 percent reporting current smoking (Millar W, 1990).

Smoking by age

A report released by Statistics Canada (Statistics Canada, 2002a) found that of males aged 15 to 19 years who smoked or were former smokers, 13 percent reported starting between five and 11 years of age, 47 percent started between the ages of 12 and 14 and 37 percent between 15 and 19. Of the females aged 15 to 19 who smoked or used to smoke, 11 percent reported starting smoking between five and 11 years of age, 56 percent between 12 and 14 years of age and 31 percent between 15 and 19 (Statistics Canada, 2002a).

2.3 Europe

In 2002 the WHO reported that around 30 percent of 15 to 18 year olds from 13 comparable European countries were current smokers (WHO, 2002). Smoking prevalence in recent years among young people in Europe appears to have increased (Enypat, 2004). This trend appears to have been mainly due to increases in smoking prevalence in Eastern European countries. Since the mid-1990s smoking among young people in Eastern Europe has risen, while rates among Western European teenagers have remained relatively stable over the same period (WHO, 2002).

Smoking by age and sex

Although in 2002 more males than females (15 to 16 years) reported current smoking in the European region⁸ (WHO, 2002) the most marked increases in youth smoking prevalence in Europe have been observed among females, particularly those from Eastern countries. In 1995, 18 percent of females aged 15 to 17 years old in Eastern Europe were daily smokers; by 1999 this figure had increased to 21 percent (Enypat, 2004). Smoking

⁸ Represented by 13 countries which have comparable data.

rates in the Western part of the region were similar among males and females aged 15 to 17 years (Enypat, 2004).

In the period from 1994 to 1998 the rate of current smoking among females aged 15 to 17 years in Europe, was observed to be less than or almost as much as for adult women. The European School Survey Project on Alcohol and other Drugs (ESPAD) survey, which contains comparable data from 13 European countries, reported that 26 percent of 15 to 16 year old females currently smoked in comparison to 22 percent of adult women. For 16 to 17 year old females the current smoking prevalence rate rose to 28 percent. For males, the pattern for the same period was more stable, with an average of 30 percent for males aged 15 to 17 years old and 36 percent for adult men (Enypat, 2004).

Smoking by countries

The WHO reports that between 1997 and 2001 the highest current national smoking prevalence rates in the European Union among 15 to 16 year-old females were found in the Russian Federation (42 percent), Finland (39 percent), Bulgaria and the Czech Republic (36 percent). The lowest current smoking prevalence rates were found in Portugal (17 percent), Israel (19 percent), and Malta (20 percent) (WHO, 2002). The highest current smoking prevalence rates among males of the same age were found in the Russian Federation (46 percent), Lithuania (46 percent), and Finland (41 percent), while the lowest were found in Portugal (18 percent), Malta (20 percent), and Italy (22 percent).

2.4 The United Kingdom

While there has been a constant decrease in overall prevalence of smoking in the United Kingdom, this has not been mirrored in the smoking rates among teenagers and children. In general, smoking rates among 11 to 15 year olds remained more or less stable between 1982 and 1994 with females often smoking more than males. An estimated 23 percent of 11 year olds in England have tried smoking, this figure rises to 63 percent of females and 59 percent of males by the age of 15 years (Sowden A, et al, 2004).

Smoking by sex

According to a 2003 survey of 11-15 year olds in England, seven percent of males and 11 percent of females smoked at least one cigarette per week (Department of Health, 2003). As ages increased so did the prevalence of weekly smoking, with 26 percent of females and 20 percent of males at 15 years of age reporting smoking (Department of Health, 2003). These results are similar to youth smoking rates in Scotland and Wales. A 1993/94 WHO study of 15 year olds found that 21 percent of males and 26 percent of females in Scotland smoked at least weekly, as did 18 percent of males and 26 percent of females in Wales (WHO, 2004).

Smoking among ethnic groups

Smoking levels vary considerably among ethnic communities living in the United Kingdom. Similar to other countries, measurement of cigarette smoking alone can under-report actual tobacco use among ethnic groups as these groups may use other tobacco products in addition to cigarettes.

Compared with the general youth population during 1999 in the United Kingdom, Irish females (29 percent) were more likely and South Asian and Chinese children (aged 8 to 15 years) much less likely to report ever having smoked tobacco. The proportion of Black Caribbean children who had ever smoked was similar to the general population (Erens B, et al, 2001).

Smoking by age

Experimentation with cigarette smoking in England has been reported to start early with an estimated 23 percent of 11 year olds in England having tried smoking. This figure rose to 63 percent of females and 59 percent of males by the age of 15 years (Sowden A, et al, 2004).

As is commonly observed elsewhere, smoking prevalence tends to increase with age among young people in the United Kingdom. However, differences in these trends have been observed in relation to ethnicity and gender. For example, among females in the general population the patterns of uptake by age appear to be more marked than males, with four percent of females aged 8 to 10 reporting having tried smoking and by ages 11 to 15 this figure increases to 33 percent. Among Black Caribbean and Irish females two percent of those aged eight to 10 reported trying smoking. By ages 11 to 15 this figure has been observed to rise to 46 percent (Nazroo J, et al, 1999).

Smoking by socio-economic status

A study found that young people from less advantaged socio-economic positions (SEP) in the United Kingdom were somewhat more likely to start smoking than young people from more affluent backgrounds, although this difference was not great. However, by their 30s half of the young people in the higher SEP group had stopped smoking while three-quarters of those in the lowest SEP group were shown to continue smoking (Jarvis M & Wardle J, 1999).

2.5 Pacific Islands

At the time of writing this report there appears to be a paucity of information about youth smoking prevalence across Pacific Island countries. Available data has been reported below.

In 1999 Fiji reported that 15.1 percent of youth aged 13 to 15 were current smokers and within this 10.8 percent reported smoking daily (David A, 2002). In 2000 the Philippines reported that 23.3 percent of 13 to 15 year olds were current smokers and 11.1 percent used other tobacco products at least once a month (David A, 2002). The only data available on smoking prevalence from Niue was collected in 1980. Although now outdated it was reported that 43 percent of males and 15 percent of females aged 20 to 24 were current smokers. In 1991, a survey conducted in Tonga reported that 60.4 percent of males and 9.8 percent of females aged 20 to 24 were current smokers (Woodward A, et al, 1994). Results from the GYTS conducted in 2000 reported that 59 percent of 13 to 15 year old youth in Palau were current users of tobacco (GYTS, 2002).

2.6 Australia

Results from the Australian 2001 National Drug Strategy Household Survey found that 15 percent of 14 to 19 year olds smoked daily. The Australian Capital Territory (Canberra) reported the highest rates of daily smoking prevalence (22 percent) among this group, followed by Queensland (18 percent) and South Australia (17 percent) (Australian Institute of Health and Welfare, 2002). A survey conducted in Victoria in 2002 found that of those students aged 12 to 17 who had smoked in the past month 80 percent had smoked in the past week (White V, et al, 2003).

Smoking by sex

Slightly more females (16 percent) have been observed to smoke daily compared to males (14 percent) (Australian Institute of Health and Welfare, 2002). In Victoria in 2002, 20 percent of males aged 12 to 17 reported current smoking compared to 22 percent of females in the same age group (White V, et al, 2003).

Smoking among ethnic groups

A study by Tang and colleagues (Tang K, et al, 1997) reported that students (class years 7 and 8) who spoke another language other than English at home were significantly less likely to report smoking than students who spoke English at home (three percent compared to seven percent, $p < 0.001$). The lower smoking prevalence among respondents speaking a language other than English at home was unexpected given the high rates of smoking reported by migrant communities in other countries, such as the United States.

Smoking among indigenous youth

In general smoking prevalence levels among the Australian Aboriginal and Torres Strait Islander populations are twice as high as those in the overall Australian population at approximately 54 percent. In some Aboriginal and Torres Strait Islander communities, the prevalence rates have been reported as high as approximately 80 percent (Lindorff K, 2002).

Smoking by age

In 2002 the proportion of current smokers among students increased with age to reach a peak frequency of 37 percent among 17 year old males and 32 percent among 17 year old females (White V, et al, 2003).

Students indicating that they had smoked in the 12 months prior to the survey increased from 18 percent of males and 15 percent of females at age 12 to reach a peak prevalence estimate of 52 percent of males at 17 years of age and 53 percent of females at 16 years of age (White V, et al, 2003).

Smoking by socio-economic status

In a study conducted in Australia, the prevalence of smoking and the average number of cigarettes smoked per week were shown to be inversely related to SEP. The average number of cigarettes smoked per week (ie, consumption) was also inversely related to SEP. The study reported that smokers in the most disadvantaged quintile smoked on average 122 cigarettes a week, compared to 87 cigarettes by those in the most advantaged quintile (Australian Institute of Health and Welfare, 2002).

2.7 New Zealand

In the following section data has been reported by school class year in addition to age. The rationale for this is that most school surveys in New Zealand have aimed to draw representative samples based on school year as opposed to age. Year 10⁹ has been the focus of school smoking surveys. However, year 10 has generally been seen to be representative of students aged 14 to 15 years (Reeder A, et al, 2000). A secondary rationale is that school-based interventions are likely to be based around a school year rather than actual ages of the students. A disadvantage of reporting by school year is that it makes it difficult to compare to international data. Therefore, where data is available age related figures are reported. However, these figures should be treated with caution, as in some circumstances sample sizes according to age may be relatively small.

Results from the ASH Year 10 Survey¹⁰ and reported by Laugesen and Scragg (Laugesen M & Scragg R, 1999) suggest that smoking behaviour of 14 and 15 year old students in New Zealand increased during the 1990s, affecting both sexes, all regions, ethnic, and socio-economic groups. More recent results from the ASH Survey reported by the Ministry of Health suggest that daily, weekly or monthly smoking rates have declined from 29 percent in 1999 to 21 percent in 2003 (Laugesen M & Scragg R, 1999). These trends are similar to other OECD countries such as those described above.

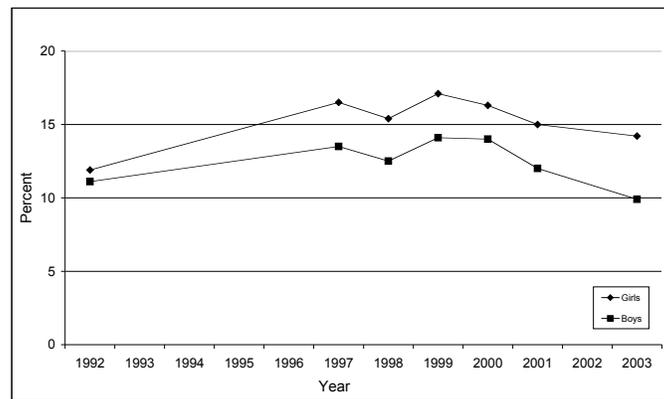
⁹ Equivalent to Form 4.

¹⁰ The ASH Year 10 Survey is an annual school mail out survey of students that aims to recruit all schools with year 10 classes.

Smoking by sex

Figure 1 presents daily smoking trends by sex between 1992 and 2003. Prevalence of daily smoking increased for both sexes until the end of the 1990s. Since 2000 daily smoking prevalence appears to have decreased for both sexes. However, this decline appears to have been greater for males. Daily smoking among females has been consistently higher than among males over the past decade.

Figure 1. Trends in daily smoking prevalence among year 10 students, 1992 to 2003



Source: MOH. *Tobacco facts*, in *Public Health Intelligence: Occasional report no. 20*. 2003, Ministry of Health: Wellington.

In 2002 the ASH Year 10 Survey found that 15 percent of females aged 14 to 15 reported being daily smokers while 10 percent of males reported daily smoking (Ministry of Health, 2003). Similar results were seen within the 2002 Youth Lifestyle Survey (YLS)¹¹ among year 10 and 12 (14-15 and 16-17 year olds) students with 17 percent of females and 13 percent of males reporting daily smoking (NFO, 2003). An Auckland study also reported similar daily smoking rates with 16 percent of year 12¹² females and 11 percent of males smoking daily (McCool J, Cameron L, Petrie K, et al, 2003). The 2002 ASH Year 10 Survey also found that 14 percent of male and 21 percent of female year 10 students reported smoking at least weekly (Ministry of Health, 2003). These rates were lower than many European countries and were favourably comparable to youth smoking rates in Australia (Ministry of Health, 2003). Comparisons between smoking rates in various countries should be treated with caution given possible questionnaire and methodological differences.

ASH Year 10 data suggests that the percentage of females (aged 14 to 15 years) who smoked daily or weekly increased from 38 percent in 1992 to 43 percent in 1997 and 44 percent in 1998. Among males of the same age, prevalence increased from 33 percent in

¹¹ The Youth Lifestyle Study is a biennial survey that uses multi-stage cluster sampling and aims to recruit 2,500 Year 10 and 1,000 Year 12 students. Questionnaires are administered in class by trained researchers.

¹² 16-17 years old.

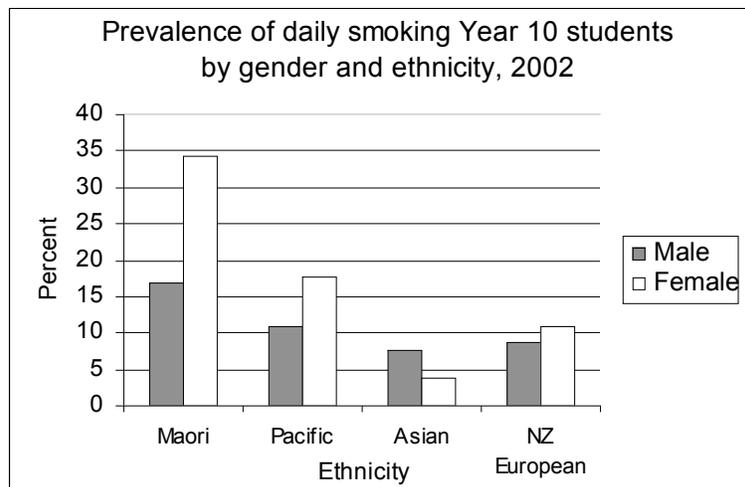
1992 to 35 percent in 1997, decreasing to 34 percent in 1998 (Laugesen M & Scragg R, 1999).

Smoking among Māori and other ethnic groups

In a study based on ASH survey results Year 10 Māori females were found to be 2.65 times more likely to smoke daily than New Zealand European Year 10 female students, while Pacific females were 1.47 times more likely to daily smoke. Asian females were about half as likely to smoke in the fourth form as New Zealand European students. Similar trends were seen for males, with Māori 1.91 times more likely to daily smoke, Pacific peoples 1.39 times more likely and Asian males 0.78 less likely to smoke than New Zealand European males (Scragg R, et al, 2002).

Results from the 2002 YLS indicated that 33 percent of Māori females in years 10 and 12 were smoking daily while 17 percent of Māori males were smoking daily (Ministry of Health, 2003). These figures were supported by 2002 ASH Year 10 survey figures (Figure 2) that found 34 percent of Māori females and 17 percent of Māori males aged 14 to 15 were daily smokers (Ministry of Health, 2003). Results from the ASH survey also suggested that Pacific females were found to have a daily smoking prevalence of 18 percent, while Pacific males had a daily smoking prevalence of 11 percent. European/other females were found to have an 11 percent daily smoking prevalence and males nine percent. The lowest smoking prevalence was observed among Asian students with four percent of females reporting daily smoking and eight percent of males (Ministry of Health, 2003).

Figure 2. Prevalence of daily smoking among Year 10 students by gender and ethnicity, 2002.



Source: MOH. *Tobacco facts*, in *Public Health Intelligence: Occasional report no. 20*. 2003, Ministry of Health: Wellington.

The 2002 Ash Year 10 Survey found that Māori females were the most likely to smoke at least once a week compared to other ethnic gender groups. Forty two percent of Māori

females reported they smoked weekly compared to 17 percent among New Zealand European females, 23 percent Pacific females, and six percent Asian females. Male rates tended to be lower with 21 percent of Māori, 14 percent of Pacific, 12 percent of New Zealand European and 10 percent of Asian males aged 14 and 15 smoking weekly (Ministry of Health, 2003).

Results from a 2002 mail-out survey to year 7 and 8 students (2002 year 7 and 8 YLS) indicated that Māori students were more likely to be current smokers than New Zealand European students (35 percent cf. 24 percent) (Darling H, et al, 2002).

Smoking by age and school year

Results from the 2002 YLS suggest that of those year 10 and 12 students who had ever tried smoking they were most likely to have done so at ages 12 or 13 (22.5 percent of all students) (Ministry of Health, 2003). Another report based on the 2002 YLS found that among year 10 students eight percent reported that they had tried cigarettes by age seven, nine percent between ages eight and nine and 15 percent between ages 10 and 11. Those students who came from lower decile schools or who identified as Māori were more likely to try smoking at earlier ages compared to higher decile schools and New Zealand Europeans (Scragg R, et al, 2002).

Students who were daily smokers by years 10 and 12 were more likely to have tried smoking at younger ages. This was particularly so for Māori daily smokers. For example, 30 percent of Māori male daily smokers reported trying their first cigarette before seven years of age or younger and 18 percent of Māori females reported trying their first cigarette before this age. This compares to 17 percent non-Māori males and eight percent non-Māori females (Scragg R, et al, 2002).

Results of the 2002 Year 7 and 8 YLS suggest that 34 percent had 'ever tried' a cigarette. Māori year 7 and 8 students were more likely to have tried a cigarette compared to Europeans. At year 10, 62 percent of students reported that they had 'ever tried' a cigarette and this figure rose to 68 percent among year 12 students (Scragg R, et al, 2002).

Similarly to 'ever trying' cigarettes, prevalence of daily smoking also increases with school year/age. The 2002 Year 7 and 8 YLS found that three percent reported smoking daily (Darling H, et al, 2002). Data from the 2002 YLS indicates that this figure increases among year 10 students to just under 13 percent and rises again slightly among year 12 students to 13 percent¹³ (Scragg R, et al, 2002).

Smoking by socio-economic status

The socio-economic status of a school has been reported to partially account for differences in daily smoking rates among students (Darling H, Reeder A, & Waa A,

¹³ These comparisons between school years should be treated with caution as the various surveys used different sampling methods and had varying sample sizes.

2004; Ministry of Health, 2003). Male and female students at schools with the lowest school deciles (lower SES) reported higher daily smoking rates than students at schools with higher deciles (higher SES). Students in low decile schools (1-3) reported 17 percent daily smoking in comparison to 12 percent in middle decile schools (4-6) and 11 percent in high decile schools (7-10) (Darling H, Reeder A, & Waa A, 2004).

3. Summary of key points

- Tobacco is the major preventable cause of death and illness in developed countries.
- The process of becoming an addicted smoker has been suggested to occur over five stages: preparatory, trying, experimental, regular and addicted smoker stages.
- At the start of the 21st century the highest recorded smoking rates in the world were observed in Western Europe.
- Female youth smoking rates in New Zealand have been consistently higher than males. This trend has been observed in a number of other developed countries.
- Recent data suggests that 21 percent of year 10 students in New Zealand are current smokers.
- New Zealand students who attend schools in lower decile areas were more likely to be smokers than those in higher decile areas. Similar relationships between socio-economic indicators and smoking behaviours have been observed internationally.
- Among New Zealand Year 10 students the most likely age for first trying a cigarette was between 10 and 11. However, those students who were Māori or were from lower decile schools were more likely to start smoking at lower ages.
- Increases were observed in smoking rates among New Zealand youth during the 1990's. However, recent data suggests that rates may now be decreasing. This trend is similar to other OECD countries.
- A possible reason why general population smoking rates have not declined markedly in New Zealand over recent years is that people who quit smoking are being replaced by new smokers.
- Māori youth have been observed to be around twice as likely to be a daily smoker compared to European youth.
- Pacific Island youth were just under one and a half times as likely to be a daily smoker compared to European youth.
- Smoking prevalence among Year 10 Māori females has been observed to be 34 percent, Māori males 17 percent, Pacific Island females 18 percent, Pacific males 11 percent, European/Other females 11 percent and European/Other males 9 percent.
- Indigenous peoples in the United States, Canada, Australia and New Zealand have consistently been observed to have markedly higher smoking rates than the non-indigenous peoples of those countries.
- High rates of tobacco use are implicated in health inequalities experienced by Māori.

PART THREE: RISK AND PROTECTIVE FACTORS ASSOCIATED WITH SMOKING INITIATION

Research over the years has shown that there is a link between smoking before and during adolescence and the likelihood of becoming a regular and persistent adult smoker. The evidence has also shown that the earlier a smoker begins, the greater the level of tobacco consumption in adult life and the lower the probability of cessation. The major physiological, psychological, and sociological challenges faced by adolescents puts them at greater risk of using tobacco as well as the use of other drugs. Once smoking has begun, and dependence is established, cessation is difficult. Research has confirmed, however, that smoking onset is less likely to occur in adulthood than during adolescence.

Research on the factors associated with youth smoking has proceeded for almost 40 years. The central question being considered is why some individuals and groups within society are more likely to smoke and others are not. In recent years, a growing segment of the literature has begun to focus on risk and protective factors – the former being the experiences and characteristics that increase the probability that one will smoke, the latter being the factors that reduce that probability. To develop prevention interventions, it is necessary to understand the functioning of protective and risk factors, their relative importance, and how they interact. The literature has evolved from basic identification of risk and protective factors among young people to identification of the complex and interactive processes that can develop over time (Tyas S & Pederson L, 1998).

In 1994, the US Surgeon General identified the association of a number of socio-demographic, environmental and personal variables with adolescent smoking. In the following review of risk and protective factors, the socio-demographic, environmental and personal variables are examined, beginning with a review of these variables conducted in 1996. The important studies that have been completed since 1996 are then summarised and discussed.

Like many health behaviours smoking is not necessarily determined by individual choice. As the following section will discuss, smoking behaviour can be influenced by factors external to the individual. That is, smoking behaviour can be seen as occurring within a social context. This context can be the individual's immediate environment, the families and communities in which they live or the wider society in which they live. Risk and protective factors can be observed that are specific to each of these levels and at a general level have been referred to as the determinants of health (Ministry of Health 1997). Identifying the levels that risk factors occur can help to identify who and where interventions should be targeted.

The following section has been structured according to four general levels at which risk and protective factors for smoking might occur. These levels are: population, community, family/peer and individual.

1. Behaviour theories

A number of behaviour theories have been used to explain youth smoking initiation, including the rational approach, social learning theory, social norms and attitudes, and developmentally orientated approach. All of these theories have gained some support in various studies but there is no single model that explains the initiation to and acquisition of smoking. Commentary suggests a need for the development of a unifying model that considers social, personal, economic, environmental, biological, and physiological influences that may influence social behaviour (Tyas S & Pederson L, 1998). Tyas and Peterson (1998) also suggested that standard definitions of outcome and predictor variables, and appropriate methodology models should be used.

2. Population factors

Population level risk factors are those that exist in society in general and have an influence on individual behaviour. They can include social mores, and prejudices, economic policy and health legislation. Population level factors can impact on youth in general or specific groups among youth. They are also often inter-linked in complex ways.

2.1 Tobacco industry advertising

Internationally, where universal advertising bans have not been implemented by governments, the role of tobacco industry advertising and marketing on adolescent smoking remains a major consideration. There has been a long debate on the impact of the advertising of tobacco products. Tobacco advertising, at around six percent of sales revenues, is about 50 percent higher than the average industry. Studies that have sought to measure the relationship between advertising and sales have tended to conclude either that advertising has no positive effect on consumption or that it shows only a very modest positive effect. However, it has been noted that these studies generally rely on highly aggregated data for relatively long time periods for all advertisers, in all media, and often over large populations. This is more likely to give a misleading impression as any major changes that could arise from an advertising campaign in any given area for any population groups are minimised in the overall results. Studies using less aggregated data are expensive and time-consuming and have, therefore, been done less often. Where they have been done, however, researchers have found more evidence of a positive effect of advertising on consumption. In addition, research among young population groups have concluded that advertising and promotion do indeed affect demand for cigarettes and attract new recruits (World Bank, 1999). For young people, this effect on demand may often occur in a subtle way, making it hard to isolate and quantify effect.

In New Zealand, most forms of tobacco industry advertising and sponsorship have been banned under the Smoke-free Environments Act 1990. This ban has been progressive, being implemented in stages between 1990 and 2003. For New Zealand adolescents,

however, industry advertising can still be accessed through a most important media – international magazines¹⁴. International studies have considered the nature and impact of tobacco advertising in the print media – especially magazines.

A United States study has investigated the relationship between adolescents' exposure to cigarette advertising in magazines and youth smoking behaviour. Researchers examined brand-specific magazine advertising exposure among youth. The longitudinal survey was conducted in 1993 and 1997 among a sample of 1,069 Massachusetts youth aged between 12 and 15 years when the study began. For those surveyed, five brands accounted for 81.8 percent of the recalled recollections of magazine advertising. These same brands accounted for 88.4 percent of the brand market share among 12 to 15 year old smokers nationally in 1993 (Pucci L & Siegel M, 1999).

Aside from advertising in magazines, another potential area of promotion for the tobacco industry is the use of product placement as a marketing tool in films. In the next section, the increased depiction of tobacco use in films and the impact on youth smoking initiation is described. It is noted that tobacco use imagery in the cinema is on the increase. A study published in 2001, examined the appearance of cigarette brands in 250 top United States box-office films for the decade 1988 to 1997. The researchers found that more than 85 percent of the films contained tobacco use and that tobacco brands appeared in 70 (28 percent) films. It was also found that brand appearances were as common in films suitable for adolescent audiences as they were in films for adult audiences, featuring in approximately a third of films for both age groupings. In addition, brand appearances were also present in 20 percent of those films rated for children. Prevalence of brand appearance did not change overall in relation to the brand. Four United States cigarette brands accounted for 80 percent of brand appearances (Sargent J, et al, 2001).

The connection between the tobacco and entertainment industries has been examined. A recently published United States study described the development of the relationship between the tobacco industry and the entertainment industry and recorded the past role of product placement. This study showed that during the 1980s four United States tobacco companies developed clear campaigns to place their products in movies and on television. While tobacco companies at the time denied any attempt at product placement, secret company documentation released into the public domain since that time has shown that a clear policy existed. Although, since 1998 in the United States there has been an agreement to end product placement, with the rise of tobacco use being depicted in movies as discussed below, doubt has been raised as to whether this agreement is being fully honoured. As a result, product placement remains an important public health problem (Mekemson C & Glantz S, 2002).

¹⁴ Note, however, that international magazines with the principal purpose of promoting smoking, or that are primarily targeted at a New Zealand audience are subject to the comprehensive tobacco advertising ban in the Smoke-free Environments Act 1990.

2.2 Tobacco imagery in film and television

Aside from advertising and marketing that can be directly attributed to the tobacco industry, there are a number of other media that present positive images to youth of tobacco use. Research has considered how this imagery impacts on children and adolescents and how important a risk factor it is for smoking initiation.

The importance of such imagery is the potential association with normative beliefs about smoking, self-identification processes and learned expectations. Exposure to smoking behaviour in movies and television provides the social context to shape these processes. Research consistently shows that such imagery of tobacco use is highly pervasive and typically glamorised. There are concerns that these images may motivate adolescents to smoke.

Film

Despite the agreement in the United States to end product placement, tobacco use is appearing in American movies at record levels. A recent study of 776 United States movies released between 1999 and 2003 indicated that 80 percent included smoking. Within age-restricted categories the result was 90 percent of R-rated films, 80 percent of PG-13 movies and 50 percent of G/PG movies (Polansky J & Glantz S, 2004).

Research documents a strong relationship between viewing tobacco use in movies and more positive attitudes toward smoking among never-smokers. A cross-sectional survey of 3,766 10 to 13 year old students was undertaken to examine the association between viewing tobacco use in movies and attitudes toward smoking among children who had never smoked a cigarette. Researchers identified an association between watching movies depicting tobacco use and susceptibility to smoking, noting that the susceptibility increased with higher levels of exposure to these types of movies. In addition, higher exposure to tobacco use in movies significantly increased the number of positive expectations endorsed by the adolescent and the perception that most adults smoke (Sargent J, et al, 2002).

A further test of whether the portrayal of smoking in movies encourages adolescents to start smoking was conducted by assessing whether adolescents who had initiated smoking preferred movie stars that smoked as part of their screen characters. As part of the 1996 California Tobacco Survey, 6,252 adolescents were questioned about their favourite stars. It was found that there were significant differences between the favourite movie stars of those adolescents who had ever smoked and those who had never smoked, with a majority of favourite stars of smokers having been depicted as using tobacco both on and off screen. In multivariate analyses and after adjusting for other known predictors of adolescent smoking, the association made with favourite movie stars who smoked was found to be only slightly weaker than the impact of peers and family who smoked (Distefan J, et al, 1999).

A similar study has assessed the relationship between adolescents' favourite movie stars, the portrayal of tobacco use by those stars in contemporary motion pictures and adolescent smoking. A smaller sample of 632 students aged between 10 and 19 years of age was surveyed. It was found that adolescents who choose movie stars who use tobacco on-screen are significantly more likely to have an advanced smoking status and more favourable attitudes toward smoking than adolescents who choose non-smoking stars (Tickle J, et al, 2001).

To test the hypothesis that greater exposure to smoking in films is associated with smoking among adolescents, a cross-sectional survey was made of 4,919 United States school children aged between nine and 15 years who were shown films that depicted tobacco use. The results of the research showed that increased levels of exposure to smoking in movies was associated with increased rates of smoking experimentation even after controlling for the effects of other social influences, parenting and personality characteristics of the child. The magnitude of the association was such that it suggested that the influence of film was as strong as other kinds of social influences such as smoking by a parent or sibling (Sargent J, et al, 2001). As a result of limitations arising from the cross-sectional design of the study, the research could not demonstrate that exposure to movie tobacco use precedes smoking initiation. Further United States research, published in 2003, undertook a prospective study to ascertain whether exposure to smoking in movies predicts smoking initiation, with a cohort of 3,547 adolescents aged 10 to 14 years who self-reported that they had never tried smoking. Within this cohort different groups were shown different numbers of films depicting tobacco. A follow-up survey was done of smoking behaviour. After controlling for baseline characteristics, adolescents in the highest quartile of exposure to movie smoking were 2.71 times more likely to initiate smoking compared with those in the lowest quartile. In this cohort, 52.2 percent of smoking initiation can be attributed to exposure to smoking in movies. It was also found that the effect of exposure to movie smoking was stronger in adolescents with non-smoking parents than in those whose parent smoked. Researchers postulated that this was linked to children with smoking parents having a more realistic view of tobacco use or that they already have a high risk and other influences had less effect (Dalton M, et al, 2003).

Television

The association between television viewing and initiation of smoking among young people has been tested in a United States study. It was found that those who watched television for five or more hours per day were 5.99 times more likely to initiate smoking than those who watched less than two hours per day (Gidwani P, et al, 2002). A recent Belgian study inquired whether television viewing is associated with adolescents increasing their cigarette consumption. Among a sample of 421 secondary school smokers, it was found that television viewing was a significant predictor of smoking volume. Those who watched five or more hours a day smoked between 60 and 147 cigarettes more per week than those who watched one hour or less (Gutschoven K & Van den Bulck J, 2004).

New Zealand studies

In New Zealand, recent research has attributed an undermining of tobacco control campaigns to, in part, an increased number of screen portrayals of smoking in films coupled with increased adolescent cinema attendance (Scragg R & Laugesen M, 2001). In New Zealand, a qualitative study was undertaken to explore how adolescents interpret smoking imagery in movies. Focus groups were held with 76 students aged 12 and 13 years old. When asked about their recollections of smoking in recently viewed films and their responses to these portrayals, students perceived that smoking in films is both highly prevalent and recognisable. However, on-screen-smoking imagery was also seen as an accurate reflection of reality (McCool J, et al, 2001). When this research was repeated with an older group of students (88 teenagers who were 16 and 17 years old), some consistency was found with the results from the younger adolescents in that the older group also perceived that smoking in film was highly prevalent. Responses to this prevalence, however, varied as the older teens tended to draw upon their own experience with tobacco use when interpreting smoking images in film. They were receptive to smoking imagery when it was used in a credible and realistic manner. However, even stereotypical images were recalled especially when tobacco use in film was associated with stress and anxiety, drug use, and seduction (McCool J, Cameron L, & Petrie K, 2003).

A recent analysis has been made of Māori Year 10 and 12 data from a survey of youth conducted in 1998. Results indicated that Māori teens were heavy consumers of media with 42 percent claiming to watch three or more hours of television a day. Radio and internet use were also high (Clarke L, 1998).

2.3 The internet

Recently, the potential of the internet as a medium for encouraging youth smoking has been noted. The internet has the potential to influence youth tobacco use not only because it provides possible access to tobacco products (see section 1.4.1), but also because it creates a venue that may stimulate demand through advertising and promotional messages. On the other hand, the internet could also be used as a health promotion tool.

In a 1998 analysis of 66 websites that promoted tobacco use, none were dedicated to national cigarette brands and only a few were corporate sites. The corporate sites did not advertise their brands or employ marketing techniques that might appeal to children. Instead, the study concluded that the sites with the greatest youth appeal were not corporate sites, but those devoted to smoking culture and lifestyle (Ribisl K, 2003). These sites featured pictures of celebrities smoking, smoking tips, and chat rooms or discussion boards for building a pro-smoking community. Although some sites warned users that they must be at least 18 to view the contents, there were no mechanisms in place to require age proof or stop access. Several of the smoking culture and lifestyle

sites provided links to pornographic websites and some featured sexually orientated photographs.

Another study examining the content of smoking culture and lifestyle websites analysed whether the sites were easily accessible to youth, featured age or health warnings, and mentioned specific tobacco brands. A content analysis of photographs on these sites assessed the demographics of individuals depicted and the amount of smoking and nudity in the photographs. The sample included 30 websites. All of the websites were accessible to youth, and none required age verification services to enter them. Cigarette brand names were mentioned in writing on 35 percent of sites, and brand images were present on 24 percent of sites. Only four of the 30 sites contained cartoons, and these depicted Joe Camel or The Simpsons. Five of the 30 sites mentioned 'smoking fetishes' and generally featured pictures of clothed and unclothed women smoking and/or sold videos of women smoking. Stories about smoking were featured on over a third of sites. In other sites that contained photographs of people smoking, the images were stylised and glamorised.

These websites may encourage youth tobacco use even without the advertising of specific brands, although no studies have been conducted on the proportion of youth that visit these sites. A number of teen smoking pages have been launched that claim to have been created by teens. Stories supposedly written by other teens are solicited for sites. Stories were often personal accounts of smoking or short stories that described topics ranging from initiation of smoking, standing up for smokers' rights, and how smoking helped attract potential boyfriends.

Aside from smoking in movies, there are internet sites that provide information on smoking in movies. Some sites have a comprehensive list of famous celebrity smokers. The amount and quality of smoking in movies featuring actresses is reviewed in detail. There are also photos depicting various actresses smoking in real life. There are even sites that have a 'Teen Celeb Index' (Ribisl K, 2003).

A large number of teen smoking clubs exist. It has been noted that the problem with these websites and chat rooms is that they are far more interactive than the traditional venues for promoting cigarettes such as print advertising. As a result, website viewers might receive a greater 'dose' of pro-smoking content. The extent these types of sites are accessed has not yet been well researched. A study of 15 to 16 year olds in England is one of the only published studies that have examined youth exposure to internet sites for cigarettes or smoking. Exposure to smoking-related internet sites was reported by four percent of non-smokers and current smokers, as well as by eight percent of those who had ever tried smoking (Ribisl K, 2003).

2.4 Youth tobacco sources

An important variable to be discussed in this section is the accessibility of tobacco as a risk factor. A 1996 literature review of factors that contribute to adolescent smoking

noted that despite the general existence of legislation prohibiting sales to minors, adolescents were able to acquire tobacco products through direct purchase themselves (where enforcement was weak and merchant compliance was low), through older friends and family members or by stealing from parents and other adults who smoked (Tyas S & Pederson L, 1998). Much is known about how youth obtain tobacco in the absence of strong prohibition laws or enforcement programmes. In addition, there are numerous studies demonstrating that aggressive efforts to enforce age-of-sale laws and strong campaigns of merchant education can succeed in reducing the sales of tobacco products directly to minors. (These are further discussed in Part Five). Rather than consider these questions, however, and keeping the New Zealand situation in mind, this current literature review of youth tobacco use has focused on considering studies that examine youth access to tobacco products in areas where sources of direct sales have been brought under control.

International studies

Recently, studies have been published that identify where youth obtain tobacco products if they are not directly purchasing them. A United States study published last year sought to determine the magnitude, nature, and correlates of the social exchange of cigarettes among smoking youth. A survey of 4,124 students aged 13 to 16 years provided information on how cigarettes were obtained. The study found that in the month prior to the survey, almost 90 percent of the smoking youth interviewed had obtained a cigarette from another teen and about 75 percent of respondents had provided cigarettes to other teens. There was a correlation between the frequency of smoking, and the frequency of supplying cigarettes to other teens (Forster J, et al, 2003).

Issues regarding youth access to substances were also examined by a study using a large student survey in Minnesota. This study was based on 133,794 surveys from Minnesota public school students in grades 6, 9 and 12 (age range of 11 to 18 years). These results also indicated that exclusive reliance on commercial sources for obtaining either cigarettes or alcohol was relatively rare, ranging from less than one to nine percent of users depending on substance and grade in school. Another implication from the findings was that, as commercial sources for cigarettes and alcohol do not enter the picture for most students until regular use is established, restricting access through retail outlets may not prevent use initiation or experimental use. On the other hand, perceptions associated with there being an ease of access could still influence initiation. Differences between the sexes were noted with females being twice as likely as males to use social sources exclusively to obtain cigarettes, alcohol and other drugs, suggesting to the researchers that males may be more willing to take the risks entailed in illegal procurement (Harrison P, et al, 2000).

The issue of social sources for obtaining tobacco was also examined in a United Kingdom study of students from seven schools in Birmingham. Data were obtained through a cross-sectional survey, one-to-one interviews and focus groups. The authors found that two-thirds of occasional smokers and one quarter of regular smokers obtained cigarettes socially, mostly for free. Results indicated that the passing and selling of

cigarettes in school was a common activity and, consequently, efforts to control illegal sales of cigarettes were not as effective as hoped. There was some evidence that a few people were prepared to use the peer market for tobacco for monetary gain. The study also showed that the social exchange of cigarettes was, for occasional smokers, a convenient form of access. For regular smokers it was an occasional way to get a cigarette when one was really needed. This study also examined the characteristics of social sources and found that those who described their group as 'quiet, friendly, nice, doing well at school' were more likely to obtain cigarettes from social sources. However, those who described their group as 'trouble makers, rebels' or 'sometimes in trouble, don't like school' were slightly more likely to use commercial sourcing rather than those described as 'popular, cool, loud, and fun' or 'sporty, popular, trendy'. One implication from the results was a suggestion that there was a sense in which young people were 'banding together' to obtain cigarettes as a direct challenge to adult opposition. It was also suggested the social markets provided an important service for occasional and experimental smokers and that instead of immediately trying to extinguish these markets, methods needed to be established for preventing smoking and the purchasing of cigarettes being a symbol of groups' and individuals' identities (Croghan E, et al, 2003).

In Finland a quasi-experimental design using tobacco purchase from commercial sources as well as from friends as indicators was used to evaluate the effectiveness of legislation relating to the sale of tobacco to minors. Data was taken from the adolescent health and lifestyle survey, a self-administered 12-page questionnaire mailed to nationally representative samples of 12, 14, 16, and 18 year olds. They found that a 1995 sales ban introduced by Finnish tobacco control legislation had a pronounced and ongoing impact on tobacco purchase by under-age children. They also found a shift from commercial sources to social sources after the bans. Findings revealed that in the overall acquisition of tobacco products the social sources were much more important than they had expected. Only two to three percent of the under-age daily smokers were found to obtain all tobacco by buying it themselves from commercial sources. They noted that adolescents used channels such as giving money to someone else, and also obtained tobacco from their friends, parents or sisters. The effect of the 1995 legislation banning tobacco sales to minors on youth smoking rates was inconclusive. The study showed a sharp decrease in daily smoking between 2001 and 2003 but the timing of the change was somewhat late compared to the enforcement of the ban (Rimpela A & Rainio S, 2004).

A further recent United States study examined how youth obtain tobacco in communities with strong enforcement of tobacco sales laws. This was done by gathering qualitative data from 68 adolescent smokers in 10 Massachusetts communities that reported merchant compliance rates of 90 percent or above. A difference was observed in the source for those initiating smoking as compared with older adolescent smokers. For new smokers, parents were a major supply source for cigarettes. In some cases, cigarettes were stolen from smoking parents; in other cases parents bought cigarettes for their children. Friends were also a primary source of cigarettes for new smokers. Another important source was for young adolescents to ask strangers to buy them tobacco. For older adolescent smokers, however, fellow teenagers who worked in stores were a major source. These working teenagers either sold cigarettes to their friends or stole cigarettes

for them. The other major sources for older adolescents were friends over 18 years of age and parents (DiFranza J & Coleman M, 2001).

Aside from social sources, the internet is emerging as another possible source for obtaining tobacco products. In 2001, market estimates were made that within a decade, 20 percent of all cigarettes will be sold over the internet. This avenue of supply held the potential to undermine public health interventions such as increased taxes, bans on advertising and youth access laws (Connolly G, 2001).

Over the last few years, studies have been undertaken to learn more about accessing cigarettes over the internet. One study was conducted to assess the prevalence of adolescent current smokers attempting to purchase cigarettes via the internet. A representative sample of 17,181 California students was surveyed. Among the 1,689 smokers in the survey a total of 2.2 percent had attempted to purchase cigarettes on the internet. Those more likely to have made such attempts were younger respondents, males, frequent smokers, and respondents reporting lower perceived availability of tobacco products from retail and social sources (Unger J, et al, 2001).

By 2003, it had been noted that no published studies had been undertaken to determine the ease of minors acquiring tobacco products over the internet. Published in that year, however, was a United States study previously conducted in 2001 to determine what proportion of internet cigarette vendors would sell cigarettes to minors. This cross-sectional study involved under-aged adolescents aged 11 to 15 years attempting to purchase cigarettes via 55 internet cigarette vendors located in 12 states. A total of 83 purchase attempts were made, paying by credit card and by money order. The minors successfully received cigarettes for 93.6 percent of attempts through credit card purchases and 88.9 percent by money orders. Age was never verified and a total of 1,650 packs of cigarettes were acquired. A 2003 United States review of studies on adolescent internet access to tobacco products reported that 82 percent of websites selling cigarettes featured warnings that the buyer must be at least 18 years old to purchase cigarettes but that effective age verification procedures were practically non-existent. Where they did exist, the procedures were not effective in preventing under-age purchases (Ribisl K, 2003).

New Zealand studies

In 1996, New Zealand legislation was amended to make it illegal for persons under the age of 18 years to purchase tobacco products after July 1997 (previously the lower limit was 16 years).

A study based on research results from the Youth Lifestyle Survey, 2000¹⁵ examined the prevalence of under-age sales of cigarettes to New Zealand secondary school students and identified correlates of buying cigarettes. Participants were 2,896 year 10 and year 12 students from 53 secondary schools located in five geographical regions within New Zealand. Results indicated that 61.8 percent of the participants who smoked reported that they usually obtained cigarettes by purchasing from shops, from other students, or from

15 This is a biennial New Zealand study focusing on smoking behaviours among youth.

someone else buying them on their behalf. The other most likely reported source was from friends. It has been conservatively estimated that the data represented at least 3,446 purchases with 58.9 percent of these being from dairies and service stations and vending machines accounting for 8.7 percent of purchase sources. Only 23.5 percent of those smoking reported someone refusing to sell them cigarettes because of their age (McGee R, et al, 2002).

A recently published study aimed to describe the sources of cigarettes for under-age youth that had smoked in the past month, the frequency of their purchases and revenue generated. Data came from a school-based cross-sectional survey, the HSC's 2002 Youth Lifestyle Study. Participants were 3,434 secondary school students from 82 schools within six geographical regions, randomly selected using multi-stage cluster sampling. Higher socio-economic decile schools were slightly over-represented. Data was gathered through a self-report questionnaire. The study found that over one third of the students who smoked had purchased tobacco products from commercial sources in the month prior to the survey. Purchases were most frequently from dairies and service stations. Being younger than 18 years was not a barrier to purchasing tobacco products for 35.7 percent of those whom smoked. Thirty eight percent of the smokers had not been asked to show proof of age when purchasing cigarettes in the month preceding the survey. Older students were more likely to be able to buy cigarettes. Darling and her colleagues noted the study indicated the need for further investigation, using longitudinal data to examine relations between smoking stages and sources of cigarettes (Darling H, Reeder A, McGee R, et al, 2004).

Further research has assessed data from the ASH Year 10 survey conducted in 1992, 1997, 1998 and 1999. This study was carried out to provide information to determine trends in smoking prevalence among Year 10 students. The study found that the proportion of students who had experienced difficulty in buying or been refused cigarettes decreased significantly from 1997 to 1999, suggesting that students perceived purchasing to be somewhat easier in 1999 than in 1997 (although still more difficult than those surveyed in 1992). This study concluded that the government campaign 1996-99 had begun to neutralise, but had not reversed, the trends of the early 1990s. It was noted that the campaign lacked media prominence and was undermined in a number of ways, including: tobacco retailers continuing to sell to a third of adolescent smokers despite the risk of prosecution; and family members of 26 percent of adolescent smokers supplying the adolescents with cigarettes (Scragg R & Laugesen M, 2001).

3. Community factors

Community level risk factors for smoking tend to be shared factors, characteristic of members of a defined community or group. This can include community institutions such as councils and schools as well as ways in which the community in general is structured and functions.

3.1 The general social environment

An important risk factor for youth smoking initiation is the normative beliefs held by children and adolescents of adult smoking. Research has shown that normative values play an important role in youth smoking. A particular link has been shown between the adolescent estimates of the prevalence of smoking among their peers and a higher risk of smoking initiation. A literature review from 1996 of studies completed over the previous decade revealed evidence that adolescent smokers tended to overestimate the prevalence of smoking among peers. However, the evidence on the impact of views about the prevalence of adult smoking as perceived by adolescents is less clear. While some studies found that adolescent smokers overestimated smoking among adults other studies did not (Tyas S & Pederson L, 1998).

A recent United States study explored relationships between patterns of smoking uptake and social context and attitudinal variables. Data was gathered through a cross-sectional survey of 982 (11 to 15 year old) students from public schools in Tucson, Arizona and Albuquerque, New Mexico. They found that students who had ever smoked lived in social contexts where there was more smoking and where smoking was more normative. Thirty-six percent of the 'ever users' had been currently smoking (in the past 30 days). These current smokers also lived in social contexts with more smoking and had positive attitudes towards smoking. The findings indicated that greater cigarette consumption was associated with more favourable attitudes towards smoking (Buller D, et al, 2003).

Another area that has received some recent attention in research is the impact on adolescent tobacco use of observing smoking in public, a phenomenon that has increased with the rising number of indoor smoking bans. It is hypothesised that public tobacco use may lead to beliefs among adolescents of a higher prevalence of tobacco use in society than that which actually exists.

Another recent United States study tested the hypothesis that the high visibility of public smoking is associated with social norms that encourage youth to smoke. A total of 9,762 students and 1,586 parents were surveyed to ascertain whether there was an association between a high visibility of smoking, perceived acceptability of smoking, and the places where youth smoked. Results indicated that smoking youth tended to witness smoking more often than non-smoking youth and perceived the behaviour as more socially acceptable. Student smokers witnessed adults smoking 1.5 to two times more often than student non-smokers. Student smokers witnessed teen smoking two to 3.5 times more often than student non-smokers did. Students perceived adult and teen smoking as more acceptable in restaurants, recreation centres, and outdoor gathering places. More student smokers than non-smokers believed that smoking was acceptable for both adults and teens. When asked about the community's opinions, student smokers perceived greater approval of both adult and youth smoking than non-smokers did. The link between visibility and social acceptability revealed a clear view of smoking as normative behaviour. The researchers also found an unexpected result - the more youth and adult smoking was observed in one location, the more student tobacco-users reported smoking there as well (Alesci N, et al, 2003).

3.2 The school environment

Wide variation in smoking prevalence between schools, which appeared unrelated to specific classroom-based anti-smoking programmes, has led to consideration of the potential for the 'culture' of the school to have an effect on student smoking. It has been suggested that changing school cultures could be an effective smoking prevention strategy.

There have been few investigations into the effects of schools on smoking. A cross-sectional study of Flemish schools assessed the relationship between the structural and policy variables of the school and characteristics of the individual on the risk and health behaviour of the adolescent. When surveys from 3,225 students, 29 school administrators and 1,132 teachers were analysed it was found that although differences between schools in risk and health behaviour were found to originate mainly from differences in pupil characteristics, substantial variation between schools remained with regard to regular smoking, after controlling for individual effects. Additional analysis revealed that a large part of the variation between schools was explained by differences between schools in truancy and repeating classes, indicating that truancy and repeating classes are not only individual characteristics but also school characteristics. These indicators were seen as a reflection of alienation from the school environment and of poor academic achievement. The findings suggested that for certain groups of students, some schools seem not to be able to provide 'meaning' and a sense of belonging for the pupils. Results further indicated that in schools where rules were clearly formulated and communicated to the pupils there were less regular smokers and drinkers. Another school characteristic was that in schools where the teachers felt they were overloaded with work, regular smoking was more prevalent. It was suggested that factors such as teachers with a lower workload or a firm policy on rules, can create an atmosphere of security and fairness in schools where health in all its dimensions is promoted (Maes L & Lievens J, 2003a).

The possibility that schools may have characteristics that have an influence on the connectedness and thus on the smoking of students was supported by a further study of students in the West Midlands. It was noted that previous studies (Conrad K, et al, 1992) had used Bernstein's model of cultural transmission to show that pupils recognise the particular expectations and values of their school, and that these differed from school to school. Although students from middle class backgrounds are more likely to be committed, while those from working class backgrounds are more likely to be alienated, this study suggested that schools could influence the proportion of committed and alienated students. This was likely to influence smoking levels as committed students have a greater opportunity to use school to promote good human functioning and health than alienated students. Data were taken from the previously conducted West Midlands Young People's Lifestyle Survey 1995/1996. A cluster sampling process was designed to derive a representative sample of students in years 7, 9 and 11 (11-16 year olds). A sample of 25,781 male and female students from 166 schools was used. The majority of the students (over 80 percent) were 'white' with no other ethnicity constituting more than

10 percent. They found that a school's achievement, represented by examination and pass rates was unrelated to smoking prevalence. However, they found that a value-added measure was related to smoking prevalence. The measure according to their theory showed how well schools transmit the instructional and regulatory orders (Aveyard P, et al, 2004).

3.3 Work environments

The workplace is an important environmental variable that has received comparatively little consideration in studies of youth at risk of smoking. Studies that have been completed on part-time work and substance use suggest that those teenagers working longer hours during the school year use cigarettes more frequently than those working less or not at all (Wu L, et al, 2003). Two recently published studies provide further valuable information.

A cross-sectional survey of 4,297 Canadian junior high and high school students aged 13 to 19 years investigated whether age moderated the relationship between part-time work hours and smoking status. Among teenagers aged 13 to 16 years old, when compared to those not working at all, those with moderate to long work hours (more than 21 hours) were more strongly associated with the probability of being a smoker. For 17 to 19 year old adolescents, work intensity was only weakly associated with cigarette use in late adolescence. Therefore, early work involvement may be a risk factor for initiating smoking. The question can be raised, however, as to the appropriateness of comparing these two age bands as they have different levels of academic commitments (Breslin F & Adlaf E, 2002).

Using data from the 1995 and 1996 National Household Surveys on Drug Abuse, researchers examined the association between employment status and substance use among students aged 12 to 17 years. Among the total sample, an estimated 1.6 percent of students were current heavy cigarette smokers. Among the one sixth of the sample who worked, however, prevalence estimates increased to 9.7 percent for heavy cigarette smoking. When considering why this association between being employed and increased rates of heavy use existed, the researchers postulated that working adolescents were (a) likely to have higher exposure to others who use cigarettes; (b) might have greater stress from working to deal with; (c) would have increased disposable income; and (d) that those students willing to commit longer hours to employment while still enrolled in school were possibly those who had poorer school performance or were dealing with a potentially wide range of psychosocial difficulties (Wu L, et al, 2003).

4. Family and peer factors

Family and peer relationships, attitudes and behaviours are often seen as having a strong influence on individual behaviour. In addition to examining the effects of parental and family member smoking status, recent research has investigated a number of other factors

associated with the impact of parents and family on adolescent smoking. These have included the structure of the family itself, the attitudes of parents towards smoking, the impact of parents giving up smoking, parenting styles and the type of relationships that exist within the family environment.

4.1 The smoking behaviour of peers and family

Social learning theory emphasises the importance of interplay between individual traits and the environment. From observing others, children develop intentions and positive expectations about smoking prior to initiation. Therefore, much of the epidemiological research on adolescent tobacco use has focused on external behavioural influences. To predict and understand the smoking behaviour of adolescents, factors such as the smoking behaviour of friends and parents have been considered. Whereas it was initially believed that children modelled their smoking or non-smoking behaviour of that of their parents, over time it was found that the influence of peers increased during adolescence. However, there are many aspects about the relative influence of parents and peers that have remained unresolved by research due to different combinations of predictor variables; the range of methods and populations; and the variety of analytical approaches that have been used (Tyas S & Pederson L, 1998).

International studies

A review of literature of research completed to 1996 noted that studies examining associations between adolescent and parental smoking had obtained variable results. A large number of studies had been conducted on the impact of parental smoking in a wide range of contexts with the result that approximately twice as many studies reported a significantly increased risk of adolescent smoking as those that did not. The remainder had noted some association, but not at a significant level. When it came to assessing whether the smoking of one parent or the other or both was more associated with adolescent smoking, there was research supporting all three possibilities. To explain this inconsistency, some studies proposed that the differences were influenced by the sex of the youth smokers (although this was only ever shown for females) while others suggested that variations existed depending on whether it was intention to smoke or experimental smoking that was being researched. In addition, a number of studies completed by 1996 had recorded the influence of sibling tobacco use on adolescent smoking. Although several reports identified a non-significant result in multivariate analyses, in others the strength of association of sibling smoking was stronger than that of smoking by parents. In relation to the influence of peer smoking, by 1996 there had been debate over the direction of the association: whether peer influence led to smoking or whether individuals who smoke tend to seek out other smokers (Tyas S & Pederson L, 1998).

A United States study published in 2002 used data from a state-wide sample of 4,296 Californian adolescents aged 11-16 years to examine the correlates of smoking prevalence estimates with the result that observations of best friend's smoking accounted

for the largest proportion of the variance in prevalence estimates. While the cross-sectional nature of the study meant that causality could not be determined, the researchers concluded that adolescents with smokers in their social networks and schools may be especially susceptible to smoking, because their peers' smoking may give them the impression that smoking is more normative and prevalent than it actually is (Unger J & Rohrbach L, 2002).

A further study sought to develop and validate short measures of 'peer pressure', 'peer conformity' and 'popularity' to investigate the effects of these variables on predicting school performance, sexual attitudes and substance abuse. This study was, however, based on a small sample and, therefore, the wider applicability of results is limited. A sample of 148 adolescent males and females in grades 1 to 13 was used. They found that 'peer pressure' (feeling pressured or doing things because others urged or dared you to) and 'peer conformity' (adopting a certain course of action sanctioned by the peer group) were potentially greater risk factors to using tobacco than a need to be 'popular' (feeling urged or pressured to do things in order to be viewed as popular) (Santor D, et al, 2000).

The effects of popularity, best friends' smoking and cigarette smoking within the peer networks on current smoking have been studied using cross-sectional data from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative school-based sample. An in-school questionnaire and an in-home interview were completed for 2,525 adolescents in grades 7 to 12. When findings were adjusted for age, gender, race/ethnicity, parent education, school and the availability of cigarettes in the home, the results indicated that the risk of current smoking was significantly associated with peer networks in which at least half of the members smoked; one or two best friends smoked; and with increasing rates of school smoking prevalence. The study additionally found there was a significant interaction of popularity and school smoking prevalence such that risk of current smoking was somewhat greater among popular students in schools with high smoking prevalence than among popular students in schools with low smoking prevalence. Because findings were based on cross-sectional data further longitudinal research is necessary to determine causal directions. The study found that further research is also needed to investigate which characteristics of peer groups are most instrumental in the initiation of cigarette smoking; how peer groups operate in schools and the reciprocal effects between peer smoking and adolescent tobacco use over time (Alexander C, et al, 2001).

A United States study published in 1998 examined parental influences on adolescent smoking uptake during the transition from never having smoked to experimentation and from experimentation to established smoking. This study revealed that parental smoking was not a significant predictor of initiation. Instead the research confirmed previous studies, which had indicated that having friends who smoked significantly predicted initiation of smoking among adolescents. In moving from experimentation to regular smoking, the most important factor was having friends who smoked. Although parental smoking was less important than a number of other factors, the research did confirm previous studies that suggested that mother's smoking was a more significant predictor than father's smoking of progression from experimentation to established smoking. The

study confirmed previous findings that the influences of friend smoking increases over time whereas the influences of parent smoking remained fairly stable (Distefan J, et al, 1998).

A further study into trends in parent and friend influence during adolescence used data from the National Longitudinal Study of Adolescent Health Researchers which included a survey of 90,000 United States adolescents with follow up surveys for a core group of almost 10,000 individuals. This study suggested that both parental and friend smoking are implicated in adolescent smoking but the influence does not vary by age. A supplementary finding was that an adolescent's smoking is more influenced by friend smoking than by parent smoking (Bauman K, et al, 2001).

Further consideration has been given to the relative contribution of smoking by peers and parents in a United States study on smoking initiation published in 2004. The four-year longitudinal study of a sample of 812 pre-adolescents looked at three groups of smoking experimenters at different ages, as well as a non-smoking majority, and followed their smoking trajectory. Results revealed that parents' smoking predicted membership in the age 11-12 starters' trajectory group, both parent and friend smoking predicted membership in the age 12-13 starters' group and only friend smoking predicted membership in the age 13-14 starters' group (Vitaro F, et al, 2004).

When examining factors associated with the transition to regular smoking, recent studies have focused on twin research to further explore the influence of smoking by others. One cross-sectional study of 3,906 Dutch twins found that significant associations were demonstrated between smoking behaviour of the adolescent participants and smoking behaviour of co-twins, same-sex siblings, smoking mothers (for female smokers) and smoking friends (Vink J, et al, 2003).

Further to this result, a longitudinal study, published in 2003, assessed the relationship between smoking onset among adolescents and the smoking status of their parents and friends. Data was collected from 15,705 adolescents from six European countries. Regression analysis showed that adolescent smoking was most strongly associated with friend smoking and especially best friend's smoking, explaining 38 percent of the variance in the total sample. However, longitudinal regression analysis showed that the association of smoking status of the best friend and friends with adolescent smoking was comparable with the association of parental smoking (De Vries H, et al, 2003).

A recently published review of 87 studies assessing the association between adolescent smoking and parent and sibling smoking behaviours challenges past findings that family smoking status is an important influence. It has been noted of the 87 studies that methods were limited by a lack of standardised instruments, there was a failure to measure important confounding and mediating factors, there was a reliance on cross-sectional designs, and the studies featured the use of inconsistent definitions of tobacco-related behaviour and assessment procedures. Aside from this, it was noted that findings across the 87 studies showed weak and inconsistent associations between parent and adolescent

smoking. It was noted that sibling and peer smoking showed greater associations with adolescent smoking (Avenevoli S & Merikangas K, 2003).

New Zealand studies

New Zealand research exists that has considered the effect on adolescent smoking of the smoking behaviour of others. Analyses of data from the Dunedin Multidisciplinary Health and Development Study, a longitudinal study of children born in April 1972 and March 1973 aimed to assess the relative influence of parents and peers on initiation of smoking as well as ascertaining whether or not parents who quit smoking influenced children and adolescents not to smoke. The researchers concluded that it was friends who smoked, rather than parents who smoked, that had an influence on children's initiation of smoking. Furthermore, it was found that parents who had given up smoking did not influence decisions to initiate smoking. Overall, therefore, there was little evidence to support the general view that existed at the time that children modelled or were motivated directly by parental behaviour (Stanton W & Silva P, 1992).

The issue of peer influence was further examined in a study of Wellington fourth formers that investigated the level of active social influence among adolescents. This study used data from two surveys (1991 and 1993) involving a total of 2,928 male and female fourth form (age 14 years) students from 15 schools, 68 percent were European-Pakeha, 16 percent Māori, seven percent other Polynesian and nine percent of other ethnic identity. The results of this study identified three groups of school-age adolescents who either promoted anti-smoking messages and activities, promoted pro-smoking messages and activities, or were inactive in relation to the issue of smoking; 26 percent of students were found to be active in promoting non-smoking. This usually took the form of a general comment regarding giving up smoking to friends and at times parents and relatives. Females (29.9 percent) were more likely than males (19.3 percent) to promote anti-smoking messages with equal gender proportions being actively pro-smoking. Many smokers (approximately 17 percent of those who had smoked in the last month) were found to be involved in promoting anti-smoking messages. Three percent of the total sample of students was found to be promoting smoking and the study noted that this nearly always took the form of actively encouraging or forcing friends, siblings or acquaintances to smoke. Findings indicated a need for further research to understand the characteristics of those who promote non-smoking or smoking and it was further suggested that delinquency as a characteristic of those who promote cigarette smoking needs to be investigated (Stanton W & McGee R, 1996).

Researchers investigated whether parental smoking and other parental behaviours are risk factors for smoking in 14 and 15 year olds. Data from a national cross-sectional survey of 14,930 female and 14,341 males fourth form students was used. Findings indicated that parental behaviours, including smoking, the amount of pocket money provided to children and whether people smoke in the home explain a significant proportion of daily smoking by adolescents and are primary determinants of the elevated smoking prevalence in Māori and Pacific students. The authors further noted that dose-response associations between these factors and daily adolescent smoking suggested a causal relationship. A

further finding was that the effect of both parents smoking on the risk of daily smoking varied between ethnic groups with the strength of the effect, which was highest in Asian students and lowest in Māori, being inversely related to the prevalence of student smoking in the subgroup (Scragg R, et al, 2003).

Despite the above results, recent analysis has been made of Māori data from a survey of youth conducted in 1998. Smoking in Māori teens was found to be compounded by the fact that large numbers of family and friends were smoking. Forty-seven percent reported their mother smoked compared to 29 percent of all teens; and 38 percent reported their father smoked compared to 31 percent of all teens. The Māori teens also had higher proportions of siblings who smoked and 51 percent reported that their best friend smoked compared to 37 percent of all teens. Very few of the environments in which the Māori teens found themselves were reported to be smokefree (Clarke L, 1998).

4.2 Family structure

Family structure has been identified as among the most consistent environmental factors associated with a predisposition towards or against adolescent smoking. Variables related to family structure have been examined in many studies dating back to the mid-1980s. In a recent review of this literature it has been noted that this body of evidence overwhelmingly identifies that intact, two-parent families are protective against smoking. This association has persisted in research conducted over the past decade and across several countries (Tyas S & Pederson L, 1998). This research has primarily focused on the nuclear family rather than on the dynamics of the extended family.

While there has been a consistency of evidence when comparing two-parent families to other structures of the nuclear family, when further examination of differences between the non-two-parent families has occurred the evidence of factors associated with increased smoking among adolescents becomes less clear. Often this difficulty has arisen due to the comparably small samples of non-traditional nuclear family structures. Furthermore, and also for the reason of insufficient sample size, a comparatively limited range of nuclear family structures have been considered.

A study has recently been published that explicitly focused on examining patterns of cigarette smoking by a wide variety of nuclear family structures in a large sample of 33,978 students in 11 European countries. With a data set of this size, the researchers were able to examine the impact of non-traditional nuclear (cf. wider, extended) families for which smaller studies would not produce a sufficient sample (eg, adolescents living with single father, biological father and stepmother or neither biological parents). As with previous studies, the European research found that adolescents living with both biological parents smoked the least when compared with other family compositions. With the inclusion of a wide range of family structures, however, it was also found that adolescents living with single mothers or with fathers and stepmothers smoked less than those living in other non-traditional family structures did. The study found that overall

these results were comparable between countries once the prevalence of different non-traditional family combinations was allowed for (Bjarnason T, et al, 2003).

4.3 Parental smoking cessation

The impact of parent smoking cessation on their children's smoking has remained a debatable issue. There are now published studies on this topic that have reached conflicting findings (Tyas S & Pederson L, 1998).

To further develop discussion, a United States study (2003) claimed to be the first prospective study to explore the extent that parent smoking cessation, occurring before the beginning of the child smoking acquisition period (aged eight to nine years), would lower the odds of the children becoming daily smokers by ages 17 to 18 years. A cohort of 3,012 children and their parents were surveyed. The researchers found that parental smoking cessation was associated with a reduced risk of their children's daily smoking. Where both parents never smoked, the odds of their child becoming a smoker by 18 years of age were reduced by 71 percent. If both parents quit smoking the odds were reduced by 39 percent. If one parent ceased smoking, the odds were reduced by 25 percent only. While this study showed the importance of parents quitting before their children entered the main period of smoking acquisition, that is before age eight, it also showed that parents who quit still placed children at substantially higher risk compared to parents who never smoked (Bricker J, et al, 2002).

4.4 Parental attitudes towards smoking

A number of studies have shown that parental attitudes toward smoking in general and their own children's smoking in particular, are related to adolescent smoking; parental indifference increases the likelihood of smoking (Tyas S & Pederson L, 1998).

A United States study (1998) examined parental influences on adolescent smoking uptake during the transition from never having smoked to experimentation and from experimentation to established smoking. While the factor of friends' smoking was found to be important for smoking initiation, parents' attitudes to smoking were key factors associated with the progression to established smoking from experimentation. It was also found that communicating with parents first about serious problems was protective against progression from experimentation to established smoking (Distefan J, et al, 1998).

A United States study published in 2001 evaluated whether adolescents were less likely to smoke if their parents voiced strong disapproval of smoking. Three cohorts of students were interviewed on parental attitudes towards smoking. At baseline, most (65.9 percent) adolescents perceived both parents as disapproving of smoking with only 17.5 percent perceiving neither parent as disapproving. It was also found, however, that parental disapproval of smoking was inversely associated with adolescent smoking. After controlling for confounding influences, adolescents who smoked and perceived strong

parental disapproval of their smoking were less than half as likely to have higher smoking levels compared with those who did not perceive strong parental disapproval. In the longitudinal assessment of those who began as 'never smokers' it was found that those who perceived strong disapproval in both parents were less than half as likely to become established smokers. On the other hand, those who perceived their parents becoming more lenient over time were significantly more likely to progress to become established smokers. Researchers noted that in all of the analyses that were conducted, the effect of parental disapproval of smoking was stronger than the effect of parent smoking (Sargent J & Dalton M, 2001).

A recent study (2003) examined the influence of parental attitudes and smoking by adolescents. A sample of 1,343 sets of parents and children were used to examine the importance of parental smoking norms and attitudes and smoking role models in the home. Using cross-sectional surveys of adolescents and their parents, the researchers found a number of variables independently related to higher smoking rates among adolescents included parents' permissiveness of adult smoking (OR = 1.80); parents having higher normative estimates of how many people smoke (OR = 1.70); parents decreased likelihood of punishing their teenager for smoking (OR = 1.65); smoking by an adult living in the home (OR = 1.99); and sibling smoking (OR = 8.95) (Komro K, et al, 2003).

4.5 Parenting and the family environment

Aspects of the family environment, including parental supervision, parental attachment and parenting style, have all been the subject of past research. In some studies it had been found that the amount of time adolescents spent in self-care, lack of knowledge by parents about their children's friends and inadequate monitoring by parents were risk factors associated with increased smoking. Other studies, however, did not observe a significant relationship between parental supervision and adolescent smoking. Several studies had recorded that where attachment to parents increased and parents also smoked, adolescents could model their smoking behaviour status more closely to that of their parents. An authoritative, positive parenting style has been associated with lower levels of adolescent smoking. Parental and other adult support was protective against adolescent smoking but mainly where there were low levels of parental smoking. Low parental concern increased the risk of males taking up regular smoking whereas poor communication with parents and restrictions on going out raised the prevalence of smoking in females (Tyas S & Pederson L, 1998).

Recent studies have also sought to investigate whether parenting style is an independent risk factor of smoking initiation and experimentation among adolescents. Positive parenting styles were connected with high levels of intimacy, autonomy and other characteristics of healthy parent-child relationships. In one small study of United States grade 8 students, surveys on parenting styles revealed that higher levels of authoritative parenting (based on an index made up of measures of warmth, structure, and

psychological autonomy granting) were associated with lower levels of tobacco use among target adolescents (Adamczyk-Robinette S, et al, 2002).

In another United States study of 812 surveyed adolescents, results showed that a positive parenting style was not a significant protective factor against the preparatory and trying stages of the transition from being a non-smoker to becoming an addicted smoker (see page 12). However, parenting styles were strongly protective against the experimental and regular stages and towards a willingness to attempt to quit. Another study published in 2003 used a longitudinal study design to assess the impact of family processes by surveying 810 children who were in early elementary school on their initiation of cigarette smoking. Researchers found that higher measures of child attachment to parent and parent involvement with the child's school were significantly and negatively associated with smoking initiation. Compared with this, among the variables that were controlled for, parent smoking, child grade level, child antisocial behaviour and depression were the strongest predictors of smoking initiation (Fleming C, et al, 2002).

Strong bonds to family have been found to be a protective factor for youth. However, a United States study of smoking behaviour among minority youth examined whether parental smoking modifies the association between parent-child connectedness and parental disapproval of youth smoking. Data from pre-intervention surveys conducted in 1994 with 2,542 male and female grades 6, 7 and 8 students from Seattle, Washington and their parent/guardians were used. Minority youth were defined as having self-identified as any racial or ethnic category other than 'white' and 58 percent of the sample were identified as minority with the largest groups being Asian, African-American and those of more than one ethnicity (each of these groups made up 30 percent or more of the minority group.) Findings indicated that perceived parental disapproval of smoking was not associated with youth smoking behaviour. Youth whose parents did not smoke and who reported low level of parent-child connectedness were twice as likely to report ever having smoked than those who reported high level of connectedness. The findings also showed that high levels of connectedness were not protective for youth of parents who smoke. Therefore, unlike youth who were highly connected to a parent who did not smoke, youth who were highly connected to a parent who smoked were as likely to have experimented with smoking as youth who were not highly connected (Tilson E, et al, 2004).

A United States study used a longitudinal, multivariate design to study predictors of smoking development among 14,333 12 to 18 year olds who constituted a nationally representative sample of the United States high school population. Among the results it was noted that poor family relations predicted initiation of experimental smoking for females (Van Den Bree M, et al, 2004).

5. Personal factors

Aside from considering behaviour that is external to the adolescent, investigations have occurred that focus on personality characteristics, motivational factors such as stress, and

personal resources such as coping. Research on smoking knowledge and attitudes have also been used as proximal determinants of smoking.

5.1 Personal resources

Under the heading of personal resources, factors that have been associated with smoking are levels of self-esteem, adult and scholastic competence, locus of control, socialisation, susceptibility to peer influence, and risk-taking. The first four have the potential to be protective against smoking whereas the last two are risk factors (Tyas S & Pederson L, 1998).

Self-esteem, self-concept and weight concerns

In one Scottish study of two cohorts of 13 to 14 year-olds, conducted 10 years apart, examination for an association between self-esteem and smoking produced inconclusive results (Glendinning A & Inglis D, 1999).

An Australian study examined whether self-concept and other factors were significant in an adolescent's transition through stages of smoking to regular smoking. Participants were 368 randomly selected male and female, 12 to 17 year old Australian high school students. Findings revealed that almost all forms of self-concept appeared to decrease as the participants initiated smoking and all forms of self-concept appeared to increase upon quitting the habit. The study identified a need for further research based on qualitative interview to elicit information from smokers in these stages about what they are thinking at that time (Thornton W, et al, 1999).

A Canadian study sought to investigate the relationship between smoking behaviour and dietary restraint by surveying a cross-sectional group of 702 young women aged 14 to 15 years. Questions were asked on Body Mass Index (BMI), smoking consumption, dietary restraint, smoking to control weight, physical self-perception, and self-esteem. The researchers found that the smokers among those surveyed had a higher engagement in dietary restraint activities and lower perceptions of physical appearance and self-esteem. The study demonstrated a relationship existing between self-perceptions and smoking consumption and that those who practised dietary restraint were more likely to use smoking to control weight (however, because of the small size of the sample the results need to be interpreted cautiously).

A further study sought to specifically explore the relationship between weight control attitudes and associated behaviours and the initiation of smoking. A cross-sectional sample of 16,862 children aged nine to 14 years was surveyed. The focus was, therefore, on younger children who may have been in the stages of smoking contemplation and experimentation. The researchers found that contemplation of smoking initiation was associated with unhappiness with appearance. Smoking experimentation was more linked to actual weight control efforts: daily exercise for males and daily dieting for

females. The researchers recorded these associations among both females and males. The magnitude of association was weaker among males but it was still significant (Tomeo C, et al, 1999).

Among a large population-based sample of 79,326 adolescents from the State of Minnesota smoking for weight control was prevalent across ethnicity and sex. Among those who smoked, 48.8 percent of females reported smoking to lose or control weight, compared with 27.6 percent of males. In addition, the prevalence of smoking for weight control was the same across several ethnic groups. In addition, the study also showed that heavy smokers were more than three times as likely as lighter smokers to smoke for weight control (Fulkerson J & French S, 2003).

A prospective study to test the relation between dieting frequency and the risk of smoking initiation among 1,295 United States students tested the hypothesis that dieting frequency at baseline would be positively associated with smoking initiation two years later. For females a statistically significant result was obtained, which suggested that dieting among females may exacerbate the risk of initiating smoking and that this risk may increase with the frequency of dieting. The same association was not found for males. The authors hypothesised that there may in fact be a weaker relationship for males but one that was not statistically significant (Austin S & Gortmaker S, 2001).

There have been a number of studies completed examining the association between body-weight/shape concerns and smoking in females. One study, using information from studies of the general population, found that it was the moderately overweight who smoked among teenage females (aged 11 to 18 years) and that for women aged less than 40 years body-weight was normal among smokers. Other specific findings were that there was a powerful association between smoking and vomiting in both eating-disordered and other young females, and that smoking was related to temptation to binge in eating-disordered subjects by being used as an alternative to such feared behaviours. In regards to the importance of recognising the underlying causes of teenage female shape/weight concerns it was suggested that:

they derive at least in part from the enduring developmental and existential challenges for the female, which she often experiences in terms of her biologically based 'fatness' and which may not be primarily attributable to anything as superficial and commercially reactive as 'fashion' (Crisp A , et al, 1999).

As the above studies show, relations exist between adolescent and youth smoking and self-perceptions as well as the objective of achieving weight control. One group of United States researchers sought to examine whether smoking initiation actually had the dramatic impact on weight as believed by adolescent smokers. A cohort of 1,697 adolescents were studied for a four-year period using self-reported survey data to investigate the relationship between smoking presence and dosage and relative weight change. Overall, the results showed that contrary to the belief generally held by adolescents, smoking initiation did not impact on weight for at least a three-year period.

Over this time, body weights for smokers were the same as the never-smoking group. In fact, researchers detected that for two years after initiation, smoking was associated with an increase in BMI. Weight gain in the first year was most pronounced for white females. In other studies, it had been this group that had most identified weight control as the reason for smoking initiation and continuance. Possible reasons to explain this were posited by the researchers as including that smoking onset is associated with other negative lifestyle factors such as alcohol and high-fat food consumption or that adolescents convinced of the weight control powers of smoking practised less dietary constraint (Cooper T, et al, 2003).

Developmental assets and resiliency factors

Both male and female adolescents have a number of characteristics that can make them either more vulnerable or more resilient towards the influences that lead to smoking.

A United States study reported a connection between the levels of developmental assets held by adolescents and tobacco use. Using cross-sectional data from a survey of 1,350 teen-parent pairs, it was found that youth who possessed several developmental assets were significantly less likely to report tobacco use than youth with low levels of assets. Developmental assets found to be particularly significant were non-parental adult role models, peer role models, family communication, use of time in organised groups, participation in religion, good health practices in relation to exercise and nutrition, community involvement, having future aspirations and being able to make responsible choices (Atkins L, et al, 2002).

5.1.3 New Zealand studies

One report from a New Zealand longitudinal study (the Dunedin Multi-disciplinary Health and Development Study - DMHDS) examined the predictors of resilience to social influences among factors associated with adolescent smoking. Children were interviewed every two years from nine to 15 years with 734 to 967 interviewed each time. Findings revealed that predictor variables for vulnerability and resilience differed across age among those with no recent history of smoking. When adolescents did not have friends who smoked, males were vulnerable to initiating smoking between ages nine and 11 years if they came from a relatively lower SES background or had an older father. At later ages males were more likely to smoke if they scored relatively higher on the measure of inattentions; experienced low social support in the family; or had an older father. One explanation related to the effect for males regarding older fathers. The authors suggest that older fathers may have less to do with adolescents as they approach adult status, are less likely to be their natural father and, thus, may provide less social support. The only predictor found for females' smoking was self-reported delinquent behaviour, which may be associated with early maturation. The study found that adolescents who had a recent history of smoking appeared to have no predictors of continued smoking except whether or not a friend smoked. Findings indicated that a more extensive search for predictors of resilience was needed in order to define this characteristic and determine whether or not resilience is best considered as a general

characteristic that is applied across risk situations or is specific to particular behaviours (Stanton W, et al, 1995).

In another New Zealand study, year 10 students at two Auckland schools with a medium/high decile rating were surveyed. The sample consisted of 368 students, of which 67 (18 percent) were current smokers. Results showed several sex differences in regard to tobacco use. The authors noted that males scored higher on the *Harter* scale in terms of *Scholastic Competence*, *Athletic Competence*, *Physical Appearance*, *Job Competence* and *Global Self Worth*. Females scored higher than males only on *Close Friendships* leading the authors to hypothesise that the low female scores in some of these domains may be contributing to the high proportion of female smokers. Further gender comparison showed that among females in the sample the smokers scored themselves relatively high in the *Social Acceptance* domain. However, the male smokers scored themselves relatively high in the *Job Competence* and *Romantic Appeal* domains compared to male non-smokers. Further analysis showed that smokers showed relatively low scores for *Scholastic Competence*, *Behavioural Conduct* and *Global Self Worth* and slightly lower scores for *Physical Appearance* and *Athletic Competence*. Students who had never smoked were found to have higher scores on all domains except for *Romantic Appeal* and *Job Competence*. The authors noted that this data would indicate that smoking is related to low self-esteem issues. The authors noted the need for further research including data from low and high decile schools. They noted the findings indicated that smoking is correlated with low self-esteem and also highlighted the need to consider whether males and females should be targeted separately (Strategy, 1999).

5.2 Religiosity

A United States study investigated the effect of family religious affiliation, religious involvement, and religious values to the risk of alcohol and cigarette use in adolescent females. A sample of 1,687 pairs of twins and their parents were surveyed. The study also examined socio-demographic considerations and analysed differences in ethnicity within the sample. The researchers found that despite higher levels of exposure to family, school and neighbourhood environmental adversities, African-American adolescents among the sample were less likely to become teenage drinkers or smokers. The researchers attributed an association of this result with the greater frequency of attendance at religious services and stronger religious values, which were also measured (Heath A , et al, 1999).

Another United States study used a longitudinal design to study predictors of smoking development among 14,333 12 to 18 year olds who constituted a nationally representative sample of the high school population. High religious involvement predicted reduced risk of progression to regular smoking in males. It was suggested that religiosity may buffer against stress and possibly reduce the need for self-medication through cigarette use, which would apply more to regular than experimental smoking (Van Den Bree M, et al, 2004).

A study of Hungarian youth identified the existence of a relationship between religiosity and smoking among males. Participation in school clubs, sports clubs, or religious groups was also found to be more important for males compared with females (Piko B & Fitzpatrick K, 2004). A United States study also suggests that the discontinuation of experimental smoking was predicted by greater involvement with active pastimes for females (Van Den Bree M, et al, 2004).

5.3 Stress and Depression

Stress and associated depression are important factors in the initiation of smoking. Changes and stresses in life and unsuccessful adjustments to these factors have a negative impact on emotional wellbeing and lead to psychological distress. A literature review of psychosocial factors associated with adolescent smoking noted that stress was clearly associated with smoking initiation and maintenance. The link between smoking and stress may relate to the pharmacological effects of nicotine that moderate stress (Tyas S & Pederson L, 1998).

International studies

A Canadian study of 1,552 students aged between 11 and 12 years investigated whether there was an association between the need to cope with stress and smoking initiation. If such an association existed, both high levels of stress and low levels of coping resources would be thought to be associated with tobacco use. This study found that for both males and females, stress (and the way in which it was coped with) offered powerful predictors of smoking initiation. For males, rebelliousness was particularly significant. For females, although a factor, rebelliousness was less significant than other predictors (Koval J & Pederson L, 1999).

A cross-sectional study examined relationships between perceived stress, coping and smoking behaviour in 3,542 11 to 16 and a half year old male and female English students recruited from secondary schools in East Sussex. When findings were adjusted for age and sex, the analysis showed that adolescents who smoked perceived more stress in their lives, reported making less use of 'problem-focused' coping strategies and more use of 'emotional' coping strategies, and were more likely to view smoking as a coping resource. ('Problem-focused' coping strategies were defined as attempts to deal with the problem causing the stress ; 'emotional' coping strategies function to regulate emotional distress associated with a given stressful situation). The study also found that females were more likely to be regular smokers than were males and less likely to report that they had never smoked. However, although females reported more perceived stress than males, females were not more likely to smoke as a result. The findings indicated that domains other than perceived stress and coping strategies need to be investigated to account for the gender differences in adolescent smoking (Lucas K & Lloyd B, 1999).

It has been well documented that individuals who experience major depression tend to have higher rates of cigarette smoking and nicotine dependence when compared with

those without depression. Several studies have also found evidence of dose-response relationships between the extent of smoking and rates of depression (Tyas S & Pederson L, 1998).

One United States study compared the association of smoking with stress and depression in an older group of youth. A total of 203 university students aged 18 and 19 years old were surveyed to ascertain correlates of tobacco use among this population group. Most significant of factors was the correlation with depression as the study found that students who had been diagnosed with or treated for depression at some time in their lifetime were 7.5 times more likely to be tobacco users than those who have never been diagnosed or treated (Lenz B, 2004).

The association of smoking with depression and anxiety was also examined in a representative group of Australian teenage smokers. Data were collected from year 7, 9, and 11 students in a state-wide survey of adolescent health in Victoria, Australia. Ethnicity was not specified. A two-stage cluster sampling procedure was used to define the study population. The findings showed that participants reporting high levels of depression and anxiety were twice as likely to be smokers after adjusting for year level, sex, alcohol use and parental smoking. The authors also found that regular smokers were almost twice as likely as occasional smokers to report high levels of depression and anxiety. Further analysis found an association between regular smoking and psychiatric morbidity in females of all ages but for males only in the youngest group. The findings of the study supported the view that symptoms of anxiety and depression are strongly associated with teenage smoking (Patton G, et al, 1996).

In addition to stress and depression, smoking has been linked with a number of mental health conditions. A United States literature review examined the current state of knowledge of psychiatric co-morbidity in adolescent cigarette smokers. This analysis revealed an association between adolescent cigarette smokers and disruptive behaviour disorders (such as oppositional defiant disorder, conduct disorder, and attention-deficit/hyperactivity disorder), major depressive disorders, and drug and alcohol use disorders, although an association does not necessarily equate to a causal relationship. The exact mechanism of the co-morbidity between smoking and psychiatric disorders was not known. With the exception of ADHD and anxiety disorders, the onset of cigarette smoking generally precedes the onset of other psychiatric disorders (Upadhyaya H, et al, 2004).

New Zealand studies

A recent New Zealand study further examined the links between major depression and cigarette smoking among young adults in a birth cohort. Data were gathered over the course of the Christchurch Health and Development Study (CHDS).

The CHDS is a longitudinal study of a birth cohort of 1,265 New Zealand children studied to age 21. It was found that young people meeting criteria for major depression had elevated rates of daily smoking and nicotine dependence. This association remained

after controlling for confounding factors and suggests a possible causal linkage between smoking and depression. The direction of causality between smoking and depression remained unknown (Fergusson D, et al, 2003).

Another New Zealand study has considered the ways in which a pessimistic outlook can impact on adolescent smoking. It has been suggested that such pessimism would lower the expected future cost of hazardous consumption as well as the future expected benefit from not participating in such behaviour. Excessive pessimism would cause too much of the former and too little of the latter. This hypothesis was tested for the onset of late-adolescent smoking in a longitudinal study of youth in New Zealand with the result that pessimism predicted the subsequent onset of smoking (Clark J, et al, 2003).

5.4 Beliefs and attitudes

Initially, the primary focus of research on adolescent smoking focused on external behavioural and environmental influences. Latterly, however, as noted in a 1996 literature review of adolescent smoking, researchers also began to consider the value adolescents place on others' opinion about their use of tobacco and adolescents' own attitudes about tobacco use. Not surprisingly, more positive attitudes toward smoking and smokers tended to be related to an increased likelihood of smoking, although some studies have found that beliefs and opinions about smoking did not predict smoking uptake in the presence of other socio-demographic, environmental, and behavioural factors. Other studies have assessed attitudes by examining the expectations of adolescents about their future cigarette use and the extent to which beliefs about future use by adolescents are realistic. Finally, attitudes to smoking and awareness of the specific health risks of tobacco have been identified as important influences on smoking habits. Although some studies have found knowledge about the detrimental health effects of smoking to be protective most do not (Tyas S & Pederson L, 1998).

Research has continued to examine the associations between adolescent smoking behaviours and attitudes about smoking. A recently published United States study, using a nationally representative data set, examined adolescent attitudes. Positive adolescent attitudes toward tobacco use were found to be associated with each stage of smoking uptake. Susceptible 'never smokers' held stronger positive opinions about tobacco use than not-susceptible, 'never smokers'. Experimenters were more likely than 'never smokers' to believe that smoking helps people relax, reduce stress, and increase social comfort. Experimenters also felt that smoking did not make one less popular. Consistently, attitudes towards smoking were most favourable among current smokers, which may suggest that as one progresses towards being a current smoker, one's attitudes change to support one's negative health behaviour. The presence of a false consensus effect among current smokers may be indicative of the reshaping of normative perceptions as one becomes more established in his/her behaviour (Castrucci B, et al, 2002).

There has also been recent research in respect of adolescent expectations about their future cigarette use. A survey was conducted of 7,022 British pupils aged between 11 and 16 years that asked questions about current and envisaged use of cigarettes and other substances. A vast majority of smokers who were surveyed (73 percent) believed that they would not be smoking in a year's time. When this was compared with prevalence data from the same sample, it was seen that many current smokers had equally unrealistic beliefs about giving up smoking. For the non-smokers who were surveyed, only three percent believed they would begin to smoke in the year following the survey. This rate too, when compared with prevalence rates, revealed that non-smokers had unrealistic beliefs about their likelihood of taking up smoking. One result not anticipated by the researchers related to an expected variation between age groups within the survey. It was hypothesised that younger children would have less realistic beliefs about their future use than older children, but the evidence did not support this, with all age groups within the survey having similarly unrealistic beliefs (Sutherland I & Shepherd J, 2002).

5.5 Other risk behaviours

Smoking in adolescents has also been found to be associated with the use of other substances and also to increased risk of personal and social problems and delinquency. Tobacco has been labelled by some as a 'gateway' drug and considerable controversy surrounds this theory. Although causal pathways may not be clear, a variety of evidence exists regarding the concurrent use of tobacco and alcohol among adolescents and the early use of tobacco being a predictor for use of other substances later in adolescence.

A United States study used data from comparable large state-wide samples of grades 7 to 12 students in New York State from surveys conducted in 1983, 1990, and 1994 to determine trends in the concurrent use of alcohol and cigarettes. The results indicated a significant co-occurrence of adolescent drinking and smoking in these surveys. In each survey, about one-third of drinkers were current smokers, and very few non-drinkers were smokers. Although females had a higher prevalence of concurrent use than males in the first two surveys, this gender gap narrowed to zero in the 1994 survey. Adolescent concurrent use of alcohol and cigarettes increased with age. Findings indicated that most racial/ethnic minorities had lower probabilities of using alcohol and cigarettes concurrently than did 'whites' suggesting a need for further research into the reasons behind the ethnic differences. In the 1990s, however, there was an increase in prevalence of alcohol and cigarette use for Blacks and Hispanics; and among younger adolescents. Another finding from this study was that when the characteristics of those adolescents who both smoke cigarettes and drink alcohol were compared with students who do not use both substances concurrently the results showed that users of both substances were at increased risk of personal and social problems, as well as increased risk of delinquency (Hoffman J, et al, 2001).

The co-occurrence of smoking and binge drinking was the focus of a further United States study. Information was gathered through face-to-face interviews with 4,425 male and female adolescents aged 13 to 18. The ethnicities of the participants were 47 percent

Anglo, 26 percent Hispanic and 24 percent were African-American. These findings also demonstrated a strong connection between adolescent cigarette and alcohol use; not only were adolescent smokers likely to be binge drinkers, but adolescent binge drinkers were also likely to be smokers. Conversely, those who abstained from involvement with one of these substances generally abstained from the other as well. There were sex differences with a positive association observed for males with increasing rates of smoking associated with increasing rates of binge drinking. Ethnic/racial differences were also found. One example was that although African-American adolescents possessed the lowest rates of smoking and binge drinking, heavy smoking African-American adolescents possessed the highest rates of binge drinking, suggesting a bimodal distribution reflecting relatively high proportions of dual abstainers and high rate dual users (Johnson P, et al, 2000).

6. Key points

The evidence of literature presented in this part of the report has identified a number of socio-demographic, environmental and personal variables that are associated with adolescent smoking. By way of summary, the key points that emerge from this body of research are presented here.

6.1 Societal context and contemplation

Evidence has been presented on the impact of societal influences on adolescent smoking in relation to tobacco industry advertising, media influences, access to tobacco products and the degree of smoking in public places. Research has shown that these factors are particularly prominent risk factors in the contemplation and initiation phases of adolescent smoking.

There has been a long debate on the association between adolescent smoking and the advertising of tobacco products. Studies using less aggregated data and measuring changes within limited time periods and for specific populations have identified that tobacco advertising does have an impact on consumption. In the New Zealand context, where long-held domestic advertising and sponsorship bans have been in place, the impact of industry advertising comes from overseas sources. Research has demonstrated the existence of a relationship between adolescent exposure to cigarette advertising in youth-orientated international magazines and brand identification among smoking youth. Within films and television the depiction of tobacco use and continuing product placement are at a record high level. On the internet, sites devoted to smoking culture and lifestyle, anti-smoking youth chat rooms and teen smoking clubs exist.

The existence of such a societal context has most likely influenced the perceptions of adolescent smokers who, research has shown, tend to overestimate the prevalence of smoking among adults as well as among peers. Adolescents contemplating smoking were more likely than 'never smokers' to believe that smoking helps people relax, reduce

stress, and increase social comfort – an impression that is reinforced in the societal contexts provided within the various media discussed above. Research has shown that more positive attitudes toward smoking and smokers have been related to an increased likelihood of beginning smoking. Research has also shown that movie and television depictions of tobacco use develop among adolescents a higher receptivity to smoking prior to trying tobacco products. Knowledge about the detrimental health effects of smoking does little to counterbalance this perception.

6.2 Preparatory/trying (stages 1 & 2)

At the smoking initiation stage, several risk factors tended to be generically applicable to the various sex and age cohorts that have been studied. One set of risk factors for smoking initiation relates to the involvement by adolescents in other health risk behaviours (eg, alcohol, illicit drugs and having had sex). A relationship has also been identified between lower self-esteem and physical self-perception and smoking initiation in youth. For females this manifested particularly in dietary restraint activities, which included smoking. In addition, stress and the way in which it was coped with, offered powerful predictors of smoking initiation.

Research has consistently shown that having friends who smoked significantly predicted initiation among non-smoking adolescents, while research on the impact of parental smoking on the various stages of adolescent smoking has produced variable results.

Analysis has also taken place on how these risk factors for initiation are reflected through socio-demographic variables. Research has shown that initiation and prevalence of smoking among adolescents typically rises with increasing age. Adolescents who begin smoking at a younger age were more likely to become regular smokers and less likely to quit smoking. Researchers have also found that a significantly increased risk of smoking initiation was observed among people from lower socio-economic backgrounds.

Another risk factor associated with initiation is the ability to access tobacco products. Research has demonstrated that even in countries with youth access laws that are strongly enforced a number of social sources exist to provide access to tobacco products when needed. It has also shown that social sources are an especially important source of tobacco products for those initiating cigarette smoking. In addition, the internet is emerging as another possible source for obtaining tobacco products.

Protective factors in respect of smoking initiation that apply across all socio-demographic cohorts include doing well within the school environment, participation in community or sports clubs, religious involvement and family connectedness.

6.3 Experimental/regular (stages 3 & 4)

Within the international literature, research studies often did not differentiate between respective phases of adolescent smoking. Instead, the process of moving from initiation to regular smoking was often dealt with at a general level.

Those studies that did specifically mention experimentation emphasised the role played by societal influences. Research has demonstrated that increased levels of exposure to smoking in movies were associated with increased rates of smoking experimentation. In addition, social sources specifically linked with experimentation were identified to include parents who either bought cigarettes for their children or had their cigarettes stolen by their children. Friends were also a primary source of cigarettes for new smokers. Another important source for young adolescents was asking strangers to buy them tobacco.

Apart from societal influences, studies generally inferred the ongoing importance of peer smoking as a major risk factor. Another specific risk factor noted in relation to experimentation was smoking linked to weight control efforts. For males this meant daily exercise while for females it was daily dieting.

Positive parenting styles were identified as being strongly protective against smoking experimentation.

6.4 Addicted/dependent (stage 5)

In moving from experimentation to regular smoking, the most important risk factor was having friends who smoked. Parental smoking was not a significant predictor of regular smoking maintenance. Transition to regular smoking was also aided by changes in access possibilities. For older adolescent smokers, fellow teenagers who worked in stores were a major source as were friends over 18 years of age and parents.

Stress and associated coping mechanisms have been identified as risk factors in relation to smoking initiation. In addition, a dose-response relationship has been shown to exist between the extent of smoking and rates of depression. Furthermore, co-morbidity between smoking and a number of mental health conditions has been demonstrated by research.

Consideration of the impact of socio-demographic variables showed that low socio-economic status in childhood increased the risk for progression to regular smoking and was associated with a reduced likelihood of smoking cessation.

Associations between sexes have been strongly recorded in the development process towards regular smoking. While one of the most important factors for both sexes was having friends who smoked; being exposed to a higher prevalence of smoking at school was a significant risk for females only. Adolescent females who smoked were also more likely to experience powerlessness in their school environment and to feel considerably less attachment to the school.

Research on smoking onset has shown in one study that 64 percent of the participants who took up smoking reported daily smoking within one year. Females were nearly twice as likely as males to report becoming a regular smoker within one year. For rapid progressors of both sexes the most important factor was having friends who smoked. In addition, however, females who reported more concern with dieting and less social success were more likely to progress to regular smoking within one year. The more concern there was the faster the progression.

In respect of protective factors, the impact of parental smoking cessation on their children's smoking remains debatable. Recent research has suggested that while parental smoking cessation was not associated with reducing the risk of initiation, it was linked with reducing the onset of regular smoking. Parental attitude to smoking was also a key factor associated with the progression to established smoking from experimentation, with parental disapproval of smoking being a strong protective factor. Positive parenting styles were also strongly protective as was connectedness to parents and the family. For females, having more shared activities with their parents was protective, whereas for males protection was enhanced by having parents present at key times of the day.

Developmental assets found to be particularly significant as protective factors included non-parental adult role models, peer role models, family communication, time spent in organised activity, participation in religion, good health practices in relation to exercise and nutrition, community involvement, having future aspirations and being able to make responsible choices. Other protective factors against transition to regular smoking were academic achievement and emotional wellbeing.

6.5 Determinants of health

Significant health inequalities exist between various groups within New Zealand, particularly affecting Māori, Pacific, and lower socio-economic groups. This is reflected to some extent in the smoking prevalence rates recorded in Part Two and discussed in Part Four (under sex, ethnicity, socio-economic areas) of this document. Overcoming these health inequalities requires consideration of a coordinated population approach that addresses the following determinants of health (Ministry of Health, 2002):

- individual lifestyle factors
- social and community influences
- living and working conditions
- gender and culture
- socio-economic and environmental conditions.

Health determinants should be seen as a priority for any future plan to reduce smoking initiation in New Zealand.

PART FOUR: NON-MODIFIABLE VARIABLES

Research has recognised the association that exists between a wide range of non-modifiable socio-demographic variables (including age, sex, ethnicity and socio-economic status) and the youth initiation of smoking. With respect to these variables, Part Two of this report presented information on the differences in rates of smoking found within the various age, sex, ethnic or socio-economic brackets. In this section of the report, studies are considered that discuss how these variables are associated with youth smoking initiation and why they might be important.

In relation to age as a variable, the prevalence section has shown that initiation and prevalence of smoking among adolescents typically rise with increasing age. Another pattern that has been detected is that adolescents who began smoking at a younger age were more likely to become regular smokers and less likely to quit smoking. Further material is also available for other socio-demographic variables in addition to the evidence on prevalence and this is considered in the following section.

One variable not considered in great depth is the possible association of initiation with genetic influences. When a literature review was published in 1998 of studies relating to adolescent smoking, one of the variables that was not considered was the influence of genetic factors. This omission arose because of the small amount of evidence available at the time. By 1999, a further review on the genetic epidemiology of smoking was able to identify up to 30 references. Data from family, adoption, and twin studies is beginning to suggest a possible genetic influence on the initiation and maintenance of smoking that is being further examined (Koopmans J, et al, 1999; Madden P, et al, 2004; Sullivan P & Kendler K, 1999).

1. Sex

As with age, the previous section on prevalence has presented information on differences in rates of tobacco use between male and female adolescents. Historically, prevalence of smoking was higher for men than women. A review of research conducted for the previous 10 years suggested that, for adolescents, reported smoking rates among females were increasing. These reports of equal or higher levels of smoking by females were primarily found in studies with subjects from countries with a western cultural orientation such as England, Australia, New Zealand and the United States (Tyas S & Pederson L, 1998).

The reasons for the recent increase in smoking rates for young women in some western societies are diverse (Tyas S & Pederson L, 1998). It is important to note, however, that some studies that have been conducted to examine different risk or protective factors have not detected any significant sex differences. Recent findings on the role that sex plays in youth smoking initiation are, therefore, set out below.

1.1 International studies

To explain why a higher prevalence of cigarette smoking existed among teenage females compared to males, qualitative analysis has been undertaken. In one study focus groups of 12 to 14 year old females were used. This showed that smoking initiation for adolescent females generally took place outside usual locations with one or two friends, but did not lead immediately to regular smoking. Smokers were seen by their peers as fun-loving and non-conformist and cigarettes were viewed as a passport to an exciting and popular lifestyle. The researchers concluded that any understanding of smoking among young women needs to take account of the dynamics of females' membership in groups of 'never', 'experimental' and 'regular' smokers in determining subsequent smoking behaviour (Lucas K & Lloyd B, 1999).

Sex differences have been strongly recorded in the development process towards regular smoking. Whereas previously the achievement of regular smoking was thought to be a slow process, recent research on smoking onset has shown that 64 percent of the participants who took up smoking reported daily smoking within one year. Strong sex differences have been recorded in respect of this rapid progression to regular smoking with females nearly twice as likely as males to report becoming a regular smoker within one year. Researchers have postulated that the reason for the variation may be linked to different physiological responses to nicotine between sexes, as research has demonstrated that women tend to metabolise nicotine more slowly than men. Therefore, lower levels of metabolic clearance may indicate that women who begin smoking are more likely to become addicted faster and progress to dependent levels of smoking (Blitstein J, et al, 2003).

A study published in the United States in 2003 found more identifiable predictors of rapid progression among females than among males. Females who reported more concern with dieting and less social success were more likely to progress to regular smoking within one year; these variables did not influence progression in males. Compared to females who expressed moderate concern with dieting, those who reported the highest level of concern were almost three times as likely to be in the rapid progressor group (Blitstein J, et al, 2003). The role of self-perception, weight concerns and self-esteem are discussed in Part Three of this report.

Other studies have identified variations associated with sex surrounding adolescent smoking. A Canadian study explored differences between the sexes in the relationship between cigarette smoking and adolescent experiences of school climate. In addition, adolescent relationships with significant adults were also analysed. Surveys of 8,179 students were conducted, with the results that adolescent females who smoke were more likely than either males or non-smoking females to experience powerlessness in their school environment and to feel considerably less attachment to the school. In addition, female smokers were more likely than male or female non-smokers to be engaged in oppositional, distanced, and unsatisfactory relationships with important adults in their lives.

Despite the recently observed trend that more adolescent females than males are taking up smoking, it also has been claimed that few studies really explore differences between the sexes in any depth. To address this gap, a recently published study sought to identify the risk and protective factors for cigarette smoking among United States adolescents using data from the National Longitudinal Study of Adolescent Health (Scal P, et al, 2003). At the smoking initiation stage, risk factors for smoking tended to be common among all four cohorts. Of predominance were: using alcohol, marijuana, and other illicit drugs; violence involvement; having had sex; having friends who smoke; and learning problems. In contrast, having a higher grade point average and family connectedness were protective across all cohorts. Several factors were significant for the majority of the cohorts including having a father who had smoked and experiencing somatic symptoms. School connectedness, and feeling that other adults cared were protective for all groups. The research showed that the factors influencing the transition to current smoking differed and it was here that differences between the sexes emerged. For example, being exposed to a higher prevalence of smoking at school was a significant risk for females only. Similarly, having friends who smoked increased the likelihood that females would transition to smoking more than it did for males. There were also variations associated with sex in relation to protective factors. Parent-family connectedness enhanced the chances of growing up free from smoking. For females, however, having more shared activities with their parents was protective, whereas for males, protection was enhanced by having parents present at key times of the day. There were, however, several protective factors common to both sexes. Academic achievement, as measured by self-reported grade average, was powerfully protective against transitioning to current smoking among all study cohorts. Perceived parental educational expectations were significantly protective for older males and approached significance for the older females. Emotional wellbeing was a powerful protective factor for all females and was nearly significantly protective for the older males.

A further United States study used both qualitative and quantitative findings to describe patterns of smoking experimentation among adolescent females. Information was gathered from 205 female students from grade 10 and 11 (mean ages 16 and 17 years respectively) of two urban high schools in Tucson, Arizona. The most frequently cited reasons for smoking were stress reduction and relaxation. The participants identified several stress-inducing situations including family environment, social relations with classmates, and schoolwork. A further finding was that smoking a cigarette facilitated social interaction by providing an opportunity for females to engage in sharing and reciprocity as a means of establishing a relationship. The participants were reported to be resistant to the fact that there was pressure to initiate smoking and the study noted that it was not surprising that cigarette smoking should be adopted as a symbol of independence and autonomy because of the associations portrayed in advertising (Nichter M, et al, 1997).

1.2 New Zealand studies

Of particular relevance is a longitudinal study of 719 New Zealand adolescents, which examined factors related to smoking status at age 13 and the persistence of smoking from ages 13 to 15. The predominant reasons for smoking at age 13 included relaxation, peer smoking and image concerns. There were no sex differences identified by the study at this age. By 15 years of age, however, different factors were associated with smoking than at 13 years. By this time, disadvantage, other drug use, and being female related to more frequent smoking. Therefore, the identification of increased rates of smoking emerging for young women in New Zealand dates back to this study (McGee R & Stanton W, 1993).

In New Zealand, surveys have been carried out to provide information to determine trends in smoking prevalence among fourth form (year 10) students. The earlier surveys reported a 37 percent increase in daily smoking from 11.6 percent in 1992 to 15.5 percent in 1997. Later findings revealed that the proportion of females smoking at least monthly declined from a peak of 31.7 percent in 1997 to 30 percent in 1999, and that this trend was particularly marked among Māori females. It was suggested that this decline may reflect greater responsiveness of these groups to tobacco control measures implemented during 1997-99. In contrast, the study found that the prevalence of smoking in males remained unchanged, at 23.1 percent in 1997 and 24.1 percent in 1999. The decrease for both sexes combined is very small despite current smokefree interventions (Scragg R & Laugesen M, 2001).

2. Ethnicity

As with age and sex, the previous section on prevalence has presented information on differences in prevalence and rates of tobacco use between ethnic groupings. Within countries such as the United States of America, Canada, Australia, or New Zealand, different rates of tobacco use are recorded between indigenous peoples, majority populations and recent immigrant populations. The details of those variations are specific to the situation of each country and unlikely to be directly transferable to the New Zealand situation. What is more important, however, is assessing research that discusses how and why ethnicity is an important factor when considering youth tobacco issues.

2.1 International studies

Aside from prevalence data, much has been recorded in both epidemiological and survey studies about ethnic variations that exist in the patterns of cigarette smoking among youth and in the factors that influence these patterns. For example, a 1999 United States research review on ethnic differences in risk factors for smoking found that the literature recorded a number of variations existed between ethnic groups. These included

perceptions of the negative consequences of smoking and the link between depressed mood and smoking. It was also suggested that the effects of peer and family influences may vary by ethnicity although the evidence regarding the relative importance of parental smoking among ethnic groups was found to be contradictory. The reviewers reached the conclusion that specific examinations were needed of the impact of ethnicity on adolescent smoking variables, with special attention being paid to identifying protective factors among ethnic subgroups (Mermelstein R, 1999a).

While it is a comparatively straightforward task to record the ethnic differences in prevalence rates, smoking patterns and factors associated with adolescent smoking, research to date has not gone very far in explaining why these differences exist. For example, in the United States it is well documented that African-Americans show significantly lower levels of initiation than other population groups and yet researchers have struggled with identifying the reasons for this difference. Some researchers have suggested that most apparent ethnic variations are better explained by an examination of other variables. A longitudinal study of a cohort of 5,115 'white' and African-Americans investigated whether socio-economic factors explained ethnic differences in regular smoking initiation. Analysis found that African-Americans had higher initiation rates and lower cessation rates but after adjustment for socio-economic factors it was found that these explained most of the racial disparity. Findings of this nature have continued. In another United States study published during 2004, individual and contextual predictors of adolescent smoking initiation and progression to daily smoking were examined by ethnicity. Using data from a national longitudinal study of almost 10,000 subjects, an overall finding was that individual factors such as family and peer influences were the most important predictors of smoking behaviours. These predictors were mostly found to be common across ethnic groups. A Canadian study of 1,824 nine to 12 year olds from 24 inner-city elementary schools located in multi-ethnic, low income neighbourhoods in Montreal aimed to identify one-year predictors of smoking initiation among 'never-smokers' and of continued smoking among 'ever-smokers'. Among the findings cultural factors and ethnicity were found to not be important predictors. The authors concluded that once familial and peer smoking was taken into account, cultural factors and ethnicity were not influential in the smoking onset process (O'Loughlin J, et al, 1998).

To further document the differences in youth tobacco initiation between ethnic groupings, one United States study used a large urban population to examine ethnic differences in adolescent smoking behaviour, sources of tobacco, knowledge of and attitudes toward youth tobacco policies, and perceptions of tobacco availability by adolescents. A total of 645 grade 8 to 10 students participated in the study. Differences were found between ethnic groups in rates of smoking; use of social and commercial sources of cigarettes; and in perceived school and parental sanctions for tobacco use. Despite finding that many of the underlying psychosocial factors, which contribute to tobacco use behaviour, cut across ethnic groups, the study noted different ethnic groups may not cope with these factors in the same way (Ma G, et al, 2003).

Other authors have pointed out that few researchers have explored how acculturation or assimilation among ethnic groups has impacted on adoption of certain behaviours, including tobacco use. One study published in 1999 considered the role of acculturation in smoking among African-American adults. Results showed that smokers were more likely to come from a traditional background, with nearly 70 percent of Black smokers being highly traditional in their cultural orientation. Among non-smokers, the majority tended to be more acculturated in their orientation (Klonoff E & Landrine H, 1999).

A further study examined aspects of acculturation through use of a model examining both the direct and mediated effects of ethnic cultural norms on cigarette use in a sample of Mexican American 11 to 14 year olds. Results suggested that high acceptance of Mexican cultural norms was a protective factor against adolescent smoking. The study noted the presence of values in Mexican culture such as collectivism that may influence youth feeling of responsibility for others, leading them to feel more confident in promoting cigarette avoidance; the confidence was also seen as related to a lesser rate of cigarette use. However, findings revealed that higher levels of peer influence appear to dampen the protective influence of acculturation (Morgan-Lopez A, et al, 2003).

In addition, the question has been raised as to how successful quantitative studies, which have formed the basis of identifying ethnic variations in youth tobacco prevalence and use, can be in identifying why differences exist? It has been suggested that the reason for this is because the quantitative studies are devoid of social and cultural context. To meet this need, it has been suggested that information on the reasons for smoking initiation between ethnicities is best derived from qualitative studies where the experiences of young people are related in their own words. It is this method that is suggested as providing researchers with insight into the meanings attached to cigarette smoking by young people from diverse ethnic backgrounds. One United States qualitative study used information from 87 individual interviews and focus groups (involving 227 respondents) with four ethnically diverse groups of young people to explore the circumstances surrounding a first smoking event including: the individuals who were present, ways in which cigarettes were obtained or offered, the setting, and the adolescent's immediate feelings and sensory experiences. It was hypothesised that cigarette smoking, as a shared experience, had symbolic value for group membership, identity and inclusiveness. Results of analyses found that the setting and social interactions surrounding initial smoking experiences belie simplistic explanations of ethnic variations in the onset of adolescent smoking. On the one hand, there were commonalities across groups - peers and family were the strongest contextual themes echoed by all adolescents in this study. Yet researchers also found that embedded within these overarching themes were important subtexts associated with any understanding of the processes through which peer and family influence smoking initiation. These included the complex roles played in the initiation process by extended family among American Indians and Hispanics, parental prompting among Hispanic youth and active parental instigation of smoking among European Americans and Hispanic adolescent females. Based on this analysis, the researchers recommended that issues surrounding ethnic identity and acculturation required further exploration (Alexander C, et al, 1999).

Another United States study used a qualitative analysis to ascertain how ethnicity plays a role in adolescent smoking. Using focus groups involving 1,175 adolescents from five ethnic groups, the research themes explored included reasons for smoking and not smoking; images of smoking and smokers; messages youth receive about smoking and not smoking; and the social context of smoking. When the data were synthesised strong differences emerged across ethnic groups in relation to reasons for not smoking and perceptions of family messages about smoking (Mermelstein R, 1999b).

2.2 New Zealand studies

The New Zealand Youth Lifestyle Study (YLS) is a biennial, school based survey of tobacco related attitudes, beliefs and behaviours. The YLS incorporates key measures from, and uses methods compatible with, the international Global Youth Tobacco Survey (GYTS). This enables data from the YLS to be internationally comparable. The GYTS is currently used in more than 150 countries (Centres for Disease Control, 2004).

The total sample for whom full tobacco data were available was 3,434. Students were predominantly from Year 10 (2,520), with the remaining 914 from Year 12. In comparison with the New Zealand population: 15.4 percent of the sample self-identified as Māori (the indigenous peoples of New Zealand): slightly under-representative of Māori in the normally resident New Zealand population of 15 year olds. Similarly, students from lower socio-economic groups were slightly under-represented in the study. Socio-economic status was assessed using school decile ratings. School decile values are officially assigned to each New Zealand school and are calculated from Census and school data.

Smoking prevalence was measured using two questions. In response to the question “have you ever smoked, even just a few puffs”, around two thirds of the students indicated that they had smoked tobacco (63 percent of boys, 67 percent of girls). The second measure of smoking status categorised students as being either non-smokers, monthly or more frequent smokers, or daily smokers. In response to the question “how often do you smoke now” 15.2 percent of girls and 10.3 percent of boys reported smoking daily. A greater proportion of Māori than European students were daily smokers. A positive association between low socio-economic status and high prevalence of smoking behaviours was evident for a number of measures, including the age when a cigarette was first tried, the prevalence of daily smoking, and exposure to second-hand smoke (SHS). In contrast, a greater proportion of students from higher socio-economic schools purchased cigarettes from shops and reported that exposure to SHS was harmful (Darling H, Reeder A & Waa A, 2004).

Another New Zealand project aimed to record in the words of Māori women, their thoughts, feelings and attitudes in regard to smoking. Personal interviews were conducted with 603 Māori women aged 15 years and over. The sample was opportunistic in that it was obtained by attending hui, marae, homes, Māori organisations and sports clubs, Māori social occasions and selected schools. The survey included smokers, non-

smokers and ex-smokers. The qualitative interviews indicated that Māori women took up smoking because they wanted to 'be cool' or 'be in the in-crowd'. Peer pressure and the fact that 'everyone else is doing it' were indicated as factors in initiation. Interviews also found a strong association of smoking with the consumption of alcohol at the pub, parties and social occasions. Among the non-smokers were those who just didn't like smoking. The authors noted that young children growing up surrounded by smokers learn that it is an acceptable part of social activity. They suggested the implementation of prevention and health promotion programmes about smoking aimed specifically at Māori people. These programmes need to be culturally appropriate and acceptable (Broughton J & Lawrence M, 1993).

Participants in another recent study were 130 Māori smokers, aged 16 to 62 (average age 35.5 years) who were intending to quit through a Noho Marae Smoking Cessation programme; 78 percent of the participants were women. During 1997-98 interviews were held prior to the participants attempting to quit, with follow-up interviews held an average of four months later. Both quantitative and qualitative information was collected. Findings indicated that about 70 percent of the participants reported their parents smoking when they were children. The average age for initiation was reported to be 12 years and almost half had tried smoking before they turned 12. A further finding was that smoking initiation predominantly occurred either with whanau or in the whanau environment or with school peers or in the school environment. The average age for progression to regular smoking was 16 years (91 percent had started smoking regularly before 17 years). Participants' explanations for why they started to smoke indicated two main categories: curiosity or negative affect (participants were experiencing a state of negative emotion at the time). Emotionally laden trigger events were more likely to occur within the whanau environment, whereas initiation at school or with school peers was more likely to be of a curiosity nature. Findings indicated that smoking initiation and progression to regular smoking is precipitated by a cumulative exposure to risk factors starting with parental smoking. The authors found that contrary to popular opinion that smoking is a rebellious act, Māori children progress to smoking to demonstrate and ensure their membership in the family and in their peer group (Glover M, undated).

3. Socio-economic

Socio-economic position is often referred to as one of the determinants of health that affects the choices that individuals have in relation to health related behaviours. Lower socio-economic position is seen as a risk factor for poorer health in general (Ministry of Health, 2002). In the context of health specific interventions, socio-economic position is seen as non-modifiable as interventions to address this usually lie outside of the health arena. However, at a societal level, addressing inequalities in socio-economic position are recognised as crucial to enhancing social well being. (Ministry of Social Development, 2004).

A literature review of studies conducted from the mid-1980s on psychosocial factors related to adolescent smoking found that higher levels of parental socio-economic variables, such as education and social class, had often been inversely related to smoking status in adolescents (Tyas S & Pederson L, 1998). Recent studies in several countries have continued to confirm this link.

3.1 International studies

A study to investigate the association between multiple indicators of socio-economic status on various stages of cigarette use (including initiation), was recently conducted in the United States using a prospective study of a small birth cohort. Researchers found that a significantly increased risk of smoking initiation was observed among people from lower socio-economic backgrounds. Low socio-economic status in childhood also increased the risk for progression to regular smoking and was associated with a reduced likelihood of smoking cessation.

However, evidence from a Canadian study indicated that socio-economic status may not always be as important as a predictor of smoking initiation as other factors. This longitudinal study used data collected as part of St Louis du Parc, a non-randomised controlled trial to evaluate the impact of a school-based heart health promotion programme. Data was taken at baseline and one year later from 1,824 nine to 12 year olds from 24 inner-city elementary schools located in multi-ethnic, low income neighbourhoods in Montreal. The objective of the study was to identify one-year predictors of smoking initiation among 'never-smokers' and of continued smoking among 'ever-smokers'. Findings revealed that although there was considerable evidence of class-based differences in the prevalence of smoking, none of their indicators of social class that included parents' education, household income, or parental employment status was associated with smoking onset. Results showed that predictors of initiation included age, male gender, friends who smoke, siblings who smoke, parent who smokes and frequent high fat/ 'junk food' consumption. Findings also revealed that age and friends who smoke were independent predictors of continued smoking in both genders and, for females, being overweight was associated with continued smoking. Cultural factors and ethnicity were also found not important in this study. Their results supported the notion that once familial and peer smoking are taken into account, cultural factors and ethnicity are not influential in the smoking onset process (O'Loughlin J, et al, 1998).

3.2 New Zealand studies

A cross-sectional study of 10,529 New Zealanders was investigated to test associations of several smoking variables with socio-economic variables. The researchers found lower educational level was associated with higher frequency of ever having smoked, lower likelihood of having quit and higher likelihood of being a current smoker. For those youth included among the sample, the association was higher than with the total sample. Associations were also found between smoking variables and other socio-economic

indicators such as occupation and income, although these associations were not as strong as those relating to educational attainment (Whitlock G, et al, 1997).

Another study considered the effect of socio-economic inequality upon ethnic variations in smoking in New Zealand. Data from the 1996 New Zealand Census was used in the analysis of Māori and Pakeha smoking rates for 73 territorial local authority areas. Findings revealed a link between ethnic inequality and smoking, which persisted after controlling for absolute deprivation. Second, Māori were more affected by high levels of social inequality than Pakeha. Third, they found a clear gender difference to the effects on inequality as Māori women were far more influenced by inequality than Māori men. Fourth, the impact of ethnic socio-economic disparities on Māori smoking was more evident in cities compared to rural areas, indicating a clear geographic dimension to the effects of inequality. Fifth, the effects of inequality apply not only to current levels of smoking, but also to the geographic patterns of quit rates. Finally, however, they noted that while the results of this study suggested that levels of social inequality have an independent influence on smoking rates among Māori, they further commented that the independent effects of community ethnic inequality on smoking were less important than absolute indicators of educational attainment or wealth. They suggested that when the final point was considered the smoking behaviour studied was a 'less than perfect fit' to Wilkinson's original hypothesis that absolute living standards are no longer important in affecting population health in developed countries (Barnett R, et al, 2004).

4. Key points

Several studies based on quantitative research methods have not detected any significant sex differences in certain risk factors surrounding smoking initiation. On the other hand, qualitative analysis has revealed that factors explaining higher initiation rates for females include the dynamics of group membership and images associated with smoking. Smokers were seen as fun-loving and non-conformist and cigarettes were viewed as a passport to an exciting and popular lifestyle.

As with sex, there have been variable results in relation to smoking and ethnicity with several studies suggesting that socio-economic variables accounted for most apparent ethnic variations among adolescents who were beginning to smoke. Qualitative research showed the existence of commonalities across all groups, especially in relation to the impact of peers and family environments, it also identified the existence of important subtexts between different groups that identified varying processes influencing smoking initiation.

PART FIVE: INTERVENTIONS

In the fifth part of this report the various interventions that have targeted the initiation of child and adolescent smoking are identified and their effectiveness, as revealed by available literature, is ascertained. While the study of interventions against youth smoking has generated as much literature as that on risk and protective factors, it appears that there have been more systematic reviews of the available data. Therefore, a more aggregated picture is available for consideration.

The first group of studies examines the use of legislative or fiscal regulation to discourage youth initiation of smoking. In the case of youth access laws, the aim is to restrict supply, whereas in the case of using taxation to increase tobacco product prices, the emphasis is on reducing demand.

The second category is an examination of the types of mass communication interventions in use and an overview of their effectiveness. In this report, the term counter-marketing refers to the use of mass-media campaigns aimed at large geographical community groupings. Counter-marketing focuses on a wide range of efforts, including paid television, radio, billboard, and paid/unpaid print counter-advertising.

The third category of interventions relates to those delivered in specific settings. Included in this report are studies that examine interventions delivered at schools, at workplaces, within homes, and through primary care settings. Within this subsection of the report, the focus is on studies that examine interventions in each of these different settings rather than considering multi-component studies.

The final group of studies examined is those that report on community interventions. Community interventions are considered in the context of multi-component policies or programmes aimed and delivered at the community level.

1. Legislative and fiscal regulation

As noted above, the interventions considered within this subsection aim at both the restriction of supply and the reduction of demand. In the former case, it is the legislation that restricts the supply of tobacco products to minors that is being considered. In the latter case, it is the reduction of demand through price regulation.

Legislation and regulation are also used in respect of several other aspects of tobacco control. Tobacco industry advertising and promotional activities are curtailed by law. Environments in which tobacco smoking can occur are prescribed by legislation. The risk factors posed by industry advertising and protective factors associated with removing smoking from public places have been discussed in the previous section of this report.

1.1 Youth access laws

Unlawful sales of cigarettes to minors seems to be common in a number of countries. In Australia, between 1996 and 2000, 545 retailer compliance checks found 34 percent of retailers illegally sold cigarettes to minors and 28 percent of these repeated the offence (Staff M, et al, 2003). In the United States nearly one quarter of under-age smokers purchased tobacco products from a store despite legislation to prevent this (Everett Jones S, et al, 2002). Studies on the impact of youth legislation have produced variable results. Interventions to prevent the sale of tobacco to minors have reduced youth tobacco use in some studies (DiFranza J, et al, 1992; Forster J, et al, 1998; Jason L, et al, 1991) but not all (Rigotti N, et al, 1997), suggesting that youth access was not uniformly restricted in these studies.

If legislation to prevent tobacco sales to minors was enforced rigorously, youth access may impact on youth smoking. A review of interventions to reduce smoking initiation published in 2004 concluded that there was evidence to suggest that interventions with retailers can lead to decreases in the number of outlets selling cigarettes to young people and that active enforcement and multi-component educational strategies were key aspects to this (Naidoo B, et al, 2004). However, studies have shown the difficulties associated with achieving high levels of compliance (O'Grady B, et al, 1999). The costs associated with such enforcement have been described as substantial (Woollery T, et al, 2000). It has been suggested that compliance rates have to be very high to contribute to significant reductions to youth smoking (WHO, 1999).

Systematic reviews have shown no detectable associations between smoking prevalence and level of merchant compliance. Also there was no evidence that an increase in compliance with restrictions was associated with a decrease in smoking prevalence (Wilson N, 2003). It has been suggested that while effective enforcement may lead to a general reduction in illegal sales of cigarettes to minors, it is not certain that it will translate into reduced and sustained reductions in youth tobacco use (Lantz P, et al, 2000). In Australia, active enforcement of tobacco access laws have been found to not reduce adolescent smoking (Staff M, et al, 2003). In the United States, a study conducted in areas of high enforcement found that adolescents were still able to access cigarettes from a number of other sources (DiFranza J & Coleman M, 2001). (See Part Three on risk and protective factors for discussion of social sources).

To improve the enforcement and implementation of tobacco control laws, it has been suggested that enforcement must be ongoing. In addition, a graduated penalty structure has been proposed, starting with moderate fines for first offences but escalating in severity. It also has been proposed that tobacco vendors be licensed, with licence removal as an option for those vendors who persistently sell tobacco products to minors (Lantz P, et al, 2000). The Centers for Disease Control and Prevention (CDC) in the United States have suggested that fees from the licensing of tobacco vendors be used to fund enforcement activities and to develop and maintain active, large-scale programmes (CDC, 1999).

Despite such proposals for improving enforcement, there has been discussion in the literature as to the efficacy of youth access legislation. Some authors have even suggested that such laws could actually encourage youth tobacco use (Darling H, Reeder A, McGee R, et al, 2004).

On the other hand, authors, while acknowledging the difficulty, expense and limited impact of youth restriction laws, point out that these remain important. Access laws can be effective in shaping community norms around tobacco (WHO, 1999). It has been suggested that despite the low effectiveness and high costs of youth access restrictions, they have value as they ensure broad interventions, build political support, and refute arguments from the tobacco industry and others who argue that limits on youth access should be adopted before stronger policies, such as tax increases and limits on advertising, are resorted to (Woollery T, et al, 2000).

Experience in some developed countries, like Canada, suggests that access measures are most effective when integrated within a more comprehensive approach (WHO, 1999). The CDC have recorded that it is critical that minors' access restrictions be combined with a comprehensive tobacco control programme that reduces the availability of social sources and limits the appeal of tobacco products (CDC, 1999).

1.2 Price regulation

Within tobacco control, pricing interventions aim to reduce smoking initiation as well as increase smoking cessation. Rather than provide subsidies or direct pricing to encourage alternatives, the primary pricing regime to influence tobacco consumption has been through increased taxation. A basic law of economics states that as the price of a commodity rises, the quantity demanded of that product will fall. The extent to which higher cigarette taxes will achieve these objectives depends upon how responsive smokers are to price increases. It has been suggested that teenagers could be more responsive than adults to changes in cigarette prices, as it is easier not to start smoking than it is to quit (due to the impact of nicotine addiction). In addition, it has been noted that the proportion of disposable income a young smoker spends on cigarettes is likely to exceed that spent by an adult smoker. Furthermore, for every adolescent smoker who reduces or gives up smoking as a result of an increase in cigarette prices, the impact spreads further due to the significance of peer smoking considerations (Lantz P, et al, 2000).

Researchers have consistently found that price increases encourage some people to stop smoking, that they prevent others from starting in the first place, and that they reduce the number of ex-smokers who resume the habit (World Bank, 1999). However, there has been some suggestion that while it is clear that more intensive smokers respond to price (due to their increased spending on tobacco products), it is debatable whether higher price deters smoking initiation or experimentation (Liang L, et al, 2003).

Most studies on price impact have focused on the adult demand for cigarettes or the effect on the overall tobacco market. Comparatively few studies have focused on teenage cigarette demand. In one review of studies conducted in the earlier 1990s, the evidence on the degree to which teenagers are responsive to changes in cigarette prices was mixed although much of this was put down to methodological differences (Lantz P, et al, 2000). In another review of evidence on the impact of changing the unit price of cigarettes, eight studies were identified that dealt with the effectiveness of increasing the price for tobacco products to reduce tobacco use and further uptake in children and adolescents. Of these, seven reported that increasing tobacco prices was associated with reduced levels of tobacco use by adolescents and young people (Hopkins D, et al, 2001). A review of the available evidence on price regulation published this year also found that there was review-level evidence demonstrating the effectiveness of increasing the price of cigarettes for reducing tobacco use prevalence and consumption among both adolescents and young adults (Naidoo B, et al, 2004). Overall, a general consensus has emerged that higher prices are an effective deterrent to youth smoking.

There is some evidence to suggest that low income populations and those that are least educated are the most price responsive, leading one review to describe tobacco taxation increases as ‘progressive public health policy’. However, concerns have been raised regarding the potential hardship of the tobacco tax burden on the low-income houses if the smoker does not quit. This has been a controversial issue. One New Zealand study estimated the loss of life expectancy attributable to tobacco taxation (via financial hardship and flow-on health effect). Data were used on the gradients in life expectancy and smoking by neighbourhood socio-economic deprivation and survey data on tobacco expenditure. Three estimates were modelled of the percentage of the crude association of neighbourhood deprivation with life expectancy that might be mediated via financial hardship: 100 percent, 50 percent, and 25 percent (best estimate). From this information the impact of tobacco taxation on life expectancy was estimated. Results indicated that for the whole of the New Zealand population, the lost life expectancy from tobacco tax was estimated to be the equivalent in numerical terms to the loss of 2.3 to 8.7 lives per year. For people in the most deprived 30 percent of neighbourhoods there was found to be a loss of life expectancy relating to three to 16 days per person. However, the loss of life expectancy attributable to smoking was 42 to 257 times greater than that attributable to tobacco tax. Limitations to this study related to uncertainty around financial hardship as a pathway contributing to deprivation-associated lost life expectancy; the lack of use of lag times for the loss of income and resulting health or disease processes in the models used; and the inability because of lack of data to stratify the population in regards to ethnicity. Despite these limitations the research indicated that there is potential quantifiable harm to life expectancy attributable to tobacco tax. However, this burden of harm appeared small when compared to hardship as a result of deprivation overall and from smoking overall. Thus findings indicated that because of the much greater harm from smoking relative to tobacco taxation, tobacco taxation is likely to be achieving far more benefit than harm in relatively socio-economically deprived populations (Wilson N, et al, 2004).

2. Social marketing

One approach that has been reported to be useful in creating and sustaining behaviour change in target audiences is social marketing.

Social marketing involves *the application of commercial marketing technologies to the analysis, planning, execution, and evaluation of programmes designed to influence the voluntary or involuntary behaviour of target audiences in order to improve the welfare of individuals and society* (Donovan, R. and Henley N, 2003).

Social marketing campaigns differ from education-based campaigns in that they aim to create and sustain behavioural changes rather than just enhance awareness and/or build skills. Social marketing involves the use of a variety of strategies such as advertising, public relations, sponsorship, advocacy, and community development. A number of different marketing concepts can be employed in social marketing campaigns. One of the best known is the '4Ps' which involves the optimal application of product, price, place, and promotion. In addition, a fifth 'P', policy, is often referred.

The social marketing process involves evidence-based decision-making using research and evaluation tools. Setting realistic, specific and measurable objectives and desired outcomes is part of this process. Understanding of the target audience is a vital component of successful social marketing and involves market and audience segmentation to better understand, address and prioritise needs, desires and motives. Another crucial factor is consultation with key groups including representative members of the target audience; agencies that will have a role in providing services related to the social marketing campaign; and any other stakeholders. In New Zealand, a key group for consultation would be Māori, in line with Treaty of Waitangi obligations.

Social marketing interventions often include mass-media campaigns. They also might feature community-based or school-based programmes. The difficulty arises, however, from the term 'social marketing' being a comparatively recent phrase used to describe youth tobacco control efforts. As such, the literature on youth tobacco interventions has not yet evaluated interventions under a social marketing banner. Instead, systematic reviews have been done of the mechanism used to achieve objectives – mass-media campaigns, community interventions and school-based programmes – rather than the theory under which they occur. To unbundle the dense and complex reviews to determine which of the studies reviewed fit under the social marketing banner would be too timely to accomplish within the time available for this literature review. Therefore, a brief discussion of social marketing examples in New Zealand and internationally will have to suffice while separate sections are maintained for examining mass-media campaigns, community-based interventions, or school-based programmes.

2.1 Mass media campaigns

Research findings have demonstrated the role played by mass-media campaigns in changing health behaviour among targeted populations. It has been shown that the most successful public health communication campaigns are those that use research and theory-based formative design principles, target at-risk audiences, and generate substantial levels of exposure (Farrelly M, et al, 2003). The ultimate goal of a tobacco use prevention mass-media campaign is to reduce the prevalence of smoking by changing social norms at a societal level and altering the knowledge, attitudes and beliefs that individuals hold regarding smoking (Friend K & Levy D, 2002). Media-based health promotion efforts have the potential to reach a large proportion of the population including those often most at risk of smoking initiation and continuance. Campaigns also have the advantage of reaching a large proportion of target audiences in a relatively inexpensive manner compared with community-based programmes. It has been suggested that mass-media counter-advertising is particularly appropriate for reaching youth, who are often heavily exposed to and greatly interested in media messages (Lantz P, et al, 2000).

Approaches and messages

Internationally, smokefree media campaigns were first aimed at countering the effects of tobacco industry advertising. Recently mass-media campaigns have attempted to change social norms through generating public support for various tobacco control policies.

Several types of approaches have been identified as being used in tobacco counter-marketing targeted at youth. Types of messages depend on intervention groups that are targeted. One has been termed as 'industry manipulation', which aims to de-legitimise the industry. Another set of approaches portray the immediate adverse health and cosmetic effects of smoking as well as the long-term adverse health effects. Others focus on 'romantic rejection' by suggesting to smokers that they will be undesirable if they smoke, thereby countering industry portrayals of smoking as sexy and alluring. An international analysis of the approaches taken has shown that most media campaigns appear to combine elements of the short-term health/romantic image and industry manipulation approaches, with varying degrees of other messages (WHO, 1999).

A review of mass-media campaigns published in 2002 found that the role played by the message or theme portrayed in changing perceptions and norms was unclear. It was suggested that the impact of any particular type of message would be dependant on several key variables, including the demographic characteristics of the population targeted and the nature of other tobacco control activities in place (Friend K & Levy D, 2002). Another study has noted that the experiences of experimental studies and evaluations of state and national campaigns are currently too limited to provide strong guidance on effective message strategies for youth prevention (Farrelly M, et al, 2003).

Other studies have at least identified some aspects of messages that seem to work. In an evaluation published in 2002 of a state-wide United States tobacco media campaign aimed at keeping non-smokers from starting, it was found that the most frequently recognised advertisements had a positive tone focusing on reasons why teenagers do not smoke. On the other hand, advertisements most likely to affect a decision to remain smokefree were those based on fear. Smokefree messages directed at non-smokers that provided negative visual images associated with smoking also served to help non-smokers remain smokefree. Portraying smokers as lacking independence, emotionally vulnerable, low in social skills, and relatively naïve were also found to be successful characteristics of smokefree messages (Neiger B, et al, 2002).

Further analysis of the type of messages to be used has also found that strong media campaigns are important. Aggressive messages focusing on industry manipulation and on second-hand smoke are especially effective. Addiction and cessation messages have also been found to be effective but more so when used with aggressive topics. Strategies emphasising the adverse cosmetic image and health effects of smoking have not been found to be effective (WHO, 1999). This research has been confirmed by a more recent study, which concluded that messages focusing on smokers endangering their family, showing a smoker's negative life circumstances (depicting smokers as unattractive and insecure), and modelling refusal skills were most effective in producing negative intentions to smoke cigarettes among youth who had previously experimented with cigarettes. Messages concerned with the health (disease and death) and cosmetic (bad breath and yellow teeth) consequences of smoking were ineffective in reducing intentions to smoke (Farrelly M, et al, 2003).

Evaluation results

A systematic review of studies on mass-media interventions published in 2000 focused only on evaluations of campaigns when compared with available control groups. A total of six studies were selected, of which two found associations with reductions in smoking behaviour as well as changes in attitudes to smoking, smoking norms, and intentions to smoke in the future. One of these studies found that the mass-media campaign was effective in influencing smoking behaviour when compared to no intervention. This campaign involved the use of provocative messages to cause personal reaction. The other study found that a mass-media campaign based on social learning theory approaches combined with a school-based programme was more effective than a school-based programme alone (Sowden A & Arblaster L, 2001).

California was the first state in the United States to mount a large multimillion dollar comprehensive programme in 1989. Within a decade, Arizona, California, Florida, Massachusetts, and Oregon had also implemented major mass-media campaigns as part of larger programmes directed at reducing tobacco use. Starting in 1998, with the Florida 'truth' campaigns, there has been an explosion of mass-media campaigns including those targeting youth. As most of these state-wide media campaigns started recently, there are few evaluation reports for many of them (Farrelly M, et al, 2003). For earlier, state-wide youth-oriented programmes, such as those in Florida and Arizona, it was found that they

appeared to be associated with reduced youth smoking rates. These campaigns seemed to be more successful than most of the smaller, community-level interventions that were also studied. The only community-level studies that showed significant results were associated with a media campaign of longer duration and greater intensity than other programmes (Wallace J, et al, 2002).

In 2002, an evaluation of a recent state-wide United States tobacco media campaign was published. This evaluation, rather than focusing on the impact of smoking behaviour, instead examined the protective benefits of media on decisions to remain smokefree. This was done by studying recall, behaviour, and attitude measures among non-smoking children and adolescents following a campaign delivered through television, radio, newspapers, magazines, and school programmes. Television and radio messages had the largest practical impact, with 73 percent of those surveyed recalling the television campaign at home, 49 percent for television at school and 47 percent for radio. An association was observed between exposure to the current campaign and an increase in the percentage of non-smokers who committed to remain smokefree, who discussed with smoking friends that they should quit and who reported friends recognised smoking was unacceptable (Neiger B, et al, 2002).

A later review focused on studies that considered differences in smoking behaviour between the time period before and after the media campaign was implemented. This approach was adopted to provide a comparison of results across studies and a measure of the relative success of the various interventions. However, insufficient data as well as differences in the way that media campaigns were implemented, made aggregation of the results impractical. Nevertheless, the qualitative data obtained suggested that well-funded and implemented mass-media campaigns targeted at the general population and implemented at the state level, in conjunction with a comprehensive tobacco control programme, were associated with reduced smoking rates among both adults and youth (Wallace J, et al, 2002).

Successful campaign elements

The primary hurdle in evaluating state and national campaigns is that, unlike controlled experiments, it is difficult to separate the independent effect of anti-tobacco advertising campaigns on youth tobacco use above and beyond other factors that exist in real world settings (Farrelly M, et al, 2003).

One systematic review of studies found that effective campaigns are those with a solid theoretical basis, that used formative research in designing campaign messages and published the message broadcast for a reasonable intensity over extensive periods of time (Sowden A & Arblaster L, 2001). It is also clear that substantial levels of campaign exposure are required before anti-tobacco efforts are likely to have an effect (Farrelly M, et al, 2003). Campaigns of longer duration and higher intensity appeared to be associated with greater declines in smoking rates (Wallace J, et al, 2002). Another review found that mass-media interventions increased their impact if the campaign strategies are based on sound social marketing principles; the effort is sufficiently large and intense; target

groups are carefully differentiated; messages for specific intervention groups are based on empirical findings regarding the needs and interests of the group; and the campaign is of sufficient duration (WHO, 2000).

The impact of media campaigns on youth smoking is influenced by other concurrent tobacco control policies. Those communities with media and school education programmes were associated with lower youth smoking rates than communities with a single intervention (Wallace J, et al, 2002). Although there is some evidence that media campaigns are more likely to succeed when co-ordinated with school- or community-based tobacco prevention, more research is needed to better understand synergies across interventions (Farrelly M, et al, 2003). Advertising is most effective when used as part of a multifaceted approach to reduce smoking including community programmes, higher taxes, and school-based programmes (WHO, 1999).

Despite the available evidence, it is difficult to establish a causal role between the policies and reductions in smoking rates even when a control group is available. In particular, other tobacco control policies that are implemented during a campaign make it difficult to identify the specific influence of media campaigns alone (Wallace J, et al, 2002). Therefore, despite growing evidence that aggressive youth prevention campaigns have been effective at reducing youth tobacco use, it is still unclear to what extent other concurrent programmes contributed to these declines (Farrelly M, et al, 2003).

A review of the available evidence on counter-advertising published this year also concluded that there is review-level evidence that mass-media campaigns are effective in reducing cigarette use prevalence in adolescents when combined with other interventions. It was noted, however, that the contribution of individual components to the overall effectiveness of these interventions cannot be attributed (Naidoo B, et al, 2004).

2.2 International examples

One United States anti-tobacco campaign directed at youth and using a social marketing approach is the Florida TRUTH campaign. This campaign was funded through the State of Florida's Office of Tobacco Control, which was formed in February 1998 following the State's settlement with the tobacco industry. The objectives of the campaign were to reduce youth tobacco use by changing the attitude of Florida teens about tobacco and the tobacco industry; reduce the availability of, and youth access to, tobacco products; and to reduce youth exposure to second-hand smoke. This campaign recognised that previous methods of reaching youth, for example with information regarding the negative effects of tobacco, were not working and so a team of advertising and public relations firms in consultation with youth themselves created the concept of a youth movement against 'Big Tobacco'. Teen delegates at the Teen Tobacco Summit in 1998 voted to change the campaign's theme to 'Truth, a generation united against tobacco' and a new youth anti-tobacco advocacy group called SWAT (Students Working Against Tobacco) was established as part of the campaign (SWAT, 1998).

Features of the Florida campaign included the following.

- The use of teen input during the development of the campaign to add style, legitimacy, and credibility and to empower the teen movement.
- A \$25 million dollar advertising campaign that ultimately included 33 television commercials, seven billboards, eight print ads and four posters.
- The use of commercial marketing techniques such as in-your-face style ads, edgy humour and high technology.
- Ads depicting real teenagers taking on the tobacco industry at the Teen Tobacco Summit and state-wide SWAT functions.
- The distribution via an official campaign van at teen functions of ‘truth’-branded merchandise, such as T-shirts and baseball caps.
- Grassroots promotional efforts including ‘truth’ sponsored teen events.
- The development of a Florida Tobacco Pilot Program (FTPP) website with anti-tobacco statistics, SWAT information and online advocacy activities.

The FTPP and their marketing team aimed to make ‘truth’ into a credible brand name easily recognised by the campaign's target audience. They also used the campaign to reposition tobacco control as ‘a hip, rebellious youth movement with the message that tobacco use is an addictive drug marketed by a callous adult-establishment’. (Legacy Foundation, 1998)

Research and evaluation have been incorporated throughout the campaign’s marketing plan to ensure that programme goals are meeting their objectives and to systematically improve marketing efforts. Baseline data was collected during the first year. Results of a telephone survey only months into the marketing campaign showed that the ‘truth’ programme had achieved a brand awareness among Florida teens aged 12 to 17 years of 92 percent. There had also been a rise of 15 percent in the percentage of teens agreeing with certain negative statements. Successive surveys have shown that campaign awareness and evidence of changing attitude among Florida youth are following an increasing trend. Further information from the second Florida Youth Tobacco Survey (FYTS) conducted in February 1999, indicated that between 1998 and 1999, the number of middle and high school teens defined as ‘current smokers’ declined by 19.4 percent and 8.0 percent respectively. This suggested that 29,000 Florida teens made the decision to not smoke during that time period, and other statistics suggest that 10,000 of these teens were likely to have continued smoking and died early as a result. This decrease was reported by the CDC to be ‘the largest annual reported decline observed in this nation since 1980’. Further follow-up surveys show that non-smoking teens are more likely to say that they had been influenced by the campaign’s message that tobacco companies were trying to manipulate them. These evaluations would seem to indicate

that the social marketing campaign developed and implemented by the FTTP has been a dramatic success and it is now the model for the Legacy Foundation's national anti-smoking campaign (Legacy Foundation, 2004).

Several other anti-tobacco campaigns in the United States have also used a social marketing approach. As part of its efforts to discourage and reduce adolescent smoking the CDC funded a social marketing campaign called 'Got a Minute? Give it to Your Kid'. This campaign was based on research indicating that children with parents who become actively involved in their lives are better able to resist using tobacco and other drugs. In developing the campaign, focus groups of parents were used and they cited lack of skills as their greatest barrier to becoming involved with their children. The campaign, as well as encouraging parents to become more involved in their children's lives, provided specific tactics to facilitate parent-child interactions. The messages were promoted from 1999 to 2004 through print ads, radio spots, a presentation, a brochure and a poster. The campaign was also adapted for use in Latino communities.

[\[http://www.aed.org/Projects/tobaccofreeyouth.cfm\]](http://www.aed.org/Projects/tobaccofreeyouth.cfm)

Canada has used social marketing in the area of tobacco control for some years. In 1985 provincial and territorial health ministries and national health associations in Canada joined and launched a National Strategy to Reduce Tobacco Use. As part of the 'message promotion' component of this strategy, Health Canada implemented an anti-tobacco social marketing campaign called 'Break Free' and its French counterpart called 'Fumer, c'est fini!'. The campaign was aimed at Canadians between the ages of 11 and 17 and ran from 1987 to 1993, using television, radio, bus and transit shelter posters, magazine ads, and targeting publications to promote the Break Free message. The campaign also featured special promotions and information activities, such as poster and lyric-writing contests. Popular entertainers and sports heroes were used as role models for the young people, and not smoking was linked with such qualities as charisma, stardom, leadership, and having a positive self-concept. Evaluation results showed strong levels of awareness of this campaign from the beginning (69 percent in 1986 and 80 percent in 1989). Over the last year of the Break Free campaign (1993-94) information was gathered through household interviews with approximately 2,000 youth. Results indicated that 39 percent of those surveyed reported that the ads were successful in helping them not to smoke and 19 percent reported the ads had helped them not to start; 15 percent of smokers reported the ads helped them to cut down the amount they smoked and four percent agreed the ads made it easier to quit. However, smokers were also twice as likely as non-smokers to feel the ads had no influence on them (36 percent of smokers versus 15 percent of non-smokers). Stronger effects were reported among non-smoking youth in French Canada and smoking youth in English Canada (Health Canada, 1997b).

Over the late 1990s the tobacco strategy in Canada targeted a wide audience. Health Canada implemented new social marketing initiatives consisting of messages that targeted not only teens and preteens, but also adults - both smokers and non-smokers - particularly caregivers, young families, opinion leaders, and influencers of children and youth. A feature of Health Canada's social marketing campaigns has been the use of

research to establish specific target groups and to develop appropriate messages and methods of delivery for those groups (Health Canada, 1997a).

3. Tobacco control interventions: specific settings

While tobacco control interventions in specific settings could include a number of different environments, the main available literature focuses on school-based programmes or the potential role of primary health care interventions. Other possible settings are not included. For example, despite the importance of workplaces presenting as an important risk factor (as discussed in the previous section), literature on interventions in workplaces and their impact on youth smoking have not yet been located.

3.1 Primary health care

Commentators generally agree that clinicians have an important role in prevention and treatment of tobacco use in adolescents, and that the rate of delivery of clinical preventive services in this area should be increased. It has been suggested that clinicians in general and specialist practices should screen children for smoking risk factors beginning at 10 years of age. As clinicians are regarded as trusted health professionals, they also have the opportunity to be effective community voices. It has been suggested that they are, therefore, best placed to teach parents to maintain smokefree households, to set non-smoking expectations early on, and to monitor adolescents for signs of smoking (Sargent J & DiFranza J, 2003).

As with other health care providers, nurses have been viewed as having a potential in tobacco control. The literature has shown that a major barrier for nursing is the lack of knowledge regarding clinically effective anti-smoking interventions. There is evidence that behaviourally based interventions by nurses for smoking prevention are effective with children. The components of these effective interventions have been shown to improve self efficacy to quit, provide social support, and discuss issues related to relapse prevention. These intervention models can be incorporated into routine clinical care of individual children or with groups (Jairath N, et al, 2003).

Recent research indicates that physician training in nicotine dependence is weak and that intervention models have not been produced. Recently it has been noted that there is a paucity of information on how to incorporate smokefree counselling into a paediatric practice. Guidelines for obtaining information on tobacco use from teenagers during office visits did not exist nor was there information on whether biomarkers of tobacco exposures were helpful in confirming reported exposure. To remedy this, a pilot study was run to test the usefulness of a short questionnaire and analysis of urinary cotinine levels to identify adolescent smokers in a paediatric practice. This was effective in identifying 92 percent of adolescents who passed through the practice during the term of the study (Benuck I, et al, 2001). Another study explored how advice could be given to non-smoking children to assist them in maintaining their abstention. The study trailed the

provision of health advice via direct and confidential postal contact. This enabled individuals to control how they utilised the information they received, whether they shared it with friends and family, whether they kept it confidential, or whether they totally ignored it. For the almost 3,000 young people involved in the trial, the intervention substantially reduced smoking uptake, particularly for males (Fidler W & Lambert T, 2001).

3.2 School-based interventions

The school has been a particular focus of efforts to influence youth smoking behaviour for more than three decades. The main perceived advantages are that almost all children can be reached through schools, and a focus on education fits naturally with the daily activities of schools. Internationally, most school-based programmes are implemented primarily by teachers and concentrate on reaching students in the classroom. Many encourage parental involvement. School anti-smoking programmes are widespread, particularly in the high-income countries, which have curriculum requirements to make children aware of the risks associated with tobacco use.

Types of interventions

Researchers have used five types of interventions in schools, each based on a different theoretical orientation.

- Giving students information about smoking, including health risks of tobacco use, and the prevalence and incidence of smoking, assuming that information alone will lead to changes in behaviour.
- A curriculum based on teaching social competence. This is a response to social learning theory, which hypothesises that children learn drug use by modelling, imitation, and reinforcement, influenced by the child's pro-drug knowledge, attitudes and skills. The focus is on teaching generic self-management personal and social skills, such as goal-setting, problem solving, and decision making, and also teaching cognitive skills to resist media.
- Social influence approaches that use normative education methods and anti-tobacco resistance skills training. These include correcting adolescents' overestimates of the smoking rates of adults and adolescents, recognising high-risk situations, increasing awareness of media, peer, and family influences, teaching and practising refusal skills, and making public commitments not to smoke.
- Combined methods draw on social competence and social influences approaches.
- Multi-model programmes combining curricular approaches with wider initiatives within and beyond the school, including programmes for parents, schools, or

communities and/or initiatives to change school policies about tobacco, or state policies about taxation, sale, availability and use of tobacco (Thomas R, 2002).

Recent evaluations

Despite the widespread use of school-based interventions, there is continued uncertainty about the relative and absolute effectiveness of school-based programmes.

Some reviews and meta-analysis have supported the continued use of school-based programmes as having a small but important impact (Rooney B & Murray D, 1996). Another analysis found a wide range of evaluation results but identified that some educational programmes resulted in a significant short-term reduction in smoking, a delay in initiation, or a desirable change in attitudes toward tobacco use (Lantz P, et al, 2000).

Recently there have been a number of questions raised about whether the school environment is the best place on which to focus interventions. It has been noted that many young smokers and potential smokers reject school values. In addition, the more sophisticated of school-based programmes are often costly and have comparatively limited reach (WHO, 1999). Furthermore, a fundamental weakness of school-based programmes lies in the fact that adolescent responses to information about long-term health consequences differ from adult responses, due partly because of adolescents' more present-oriented behaviour and partly due to their tendency to rebel against adult advice (World Bank, 1999).

A recent systematic review sought to assess the effectiveness of school-based programmes in preventing children and adolescents from starting smoking. A further objective was to assess which programme elements were associated with effectiveness. The review considered the effectiveness of various interventions according to their theoretical orientation. The reviewers selected studies in which individual students, classes, schools, or school districts were randomised to the intervention or control groups and followed for at least six months. To be selected the study had to include participants who were aged five to 18. The review included 76 randomised controlled trials of school-based interventions. The largest group of studies included those based to a greater or lesser degree on social influence models. Other approaches had not been well evaluated. There was no rigorous test of the effects of information-giving programmes. There was limited data testing of pure social competence interventions. There was also a lack of high-quality evidence about the effectiveness of combinations of social influences and social competence interventions, and of multi-model programmes that include community interventions. A further problem encountered for interpreting the findings of the existing studies was to characterise the interventions. Many of the programmes considered, even when there was a clear theoretical orientation, had different components and disagreement about which are the effective elements. For the 76 studies selected, quality control criteria against selection, performance and attrition bias and other shortcomings resulted in only 16 studies being eligible for review. Of these, 15 were studies of social influences interventions. Eight showed some positive effect of

intervention on smoking prevalence, and seven failed to detect an effect on smoking prevalence (Thomas R, 2002).

The review concluded that there was no strong evidence for offering school-based programmes that provide information only. It was also noted that although social influence models are the most widely used in schools there was conflicting evidence regarding their effectiveness. The review noted that it was possible that combining social influences models with other components, such as community interventions and generic social competence training may improve effectiveness. The offering of programmes that focus on student characteristics such as social, gender or cultural groups, or targeting programmes aimed at high-risk groups may also be more effective. The reviewer noted, however, that rigorous evaluation and data from direct comparisons had not yet been completed.

The researcher realised the findings differed from previous and more optimistic meta-analyses or reviews but explained this by noting that these earlier findings were often based on small studies of less rigorous design that have presented difficulties in characterising the nature of the interventions (Thomas R, 2002).

The school environment

As noted earlier in this report, research is beginning to consider the potential for the 'culture' of the school to have an effect on student smoking. It, therefore, has been suggested that changing school cultures could be an effective smoking prevention strategy. At the moment, however, the research is considered indicative and the usual recommendation recorded is the need for more analysis to clearly identify what aspects of the school environment could be altered to discourage youth smoking. Authors of the recent cross-sectional study of Flemish schools recommended that further research should look closely at the interaction of measures taken at the school level and the home environment for specific health topics and use experimental studies to explore further whether schools are able to make a difference for all health and risk behaviours (Maes L & Lievens J, 2003b). The West Midlands study already examined in this report reached findings that indicated a need for further study in developing measures of school culture; investigating why and how schools with different value-added scores influence students' lives, and examining how the pupils themselves perceive and interpret the support and control provided by the schools (Aveyard P, et al, 2004).

4. Community interventions

Within much of the literature, community interventions are widely defined as efforts evolving from school-based programmes into the wider community, efforts to reach out-of-school youth, or to initiate or support community action around a specific issue (WHO, 1999). Initially, tobacco control interventions for youth were focused on the school. As evaluation results showed the effectiveness of school-based programmes to have been mixed, it was increasingly recognised that interventions needed to occur in the

wider community environment. Compared with single-settings-based interventions, recognition that decisions to smoke were made within a broad social context has led to the development and implementation of community-wide programmes (Sowden A, et al, 2004). The objective of community interventions has been broadly described as being to achieve individual behaviour change that supports the smokefree lifestyle. For this to occur, communities must change the way tobacco is promoted, sold, and used while changing the knowledge, attitudes, and practices of young people, tobacco users, and non-users. Effective community programmes are said to involve people in their homes, workplaces, schools, places of worship and entertainment, civic organisations, and other public places (CDC, 1999).

For the purposes of a recent systematic review community interventions were seen as those with multiple components (such as age restrictions for tobacco purchase, tobacco-free public places, various mass-media communications and special programmes in schools) that had been combined to create large-scale community-wide initiatives to prevent the uptake of smoking in young people. It has been suggested that the goals of most community interventions are to set in place structures that both support and reinforce efforts to improve health and wellbeing. It has been argued that the essence of the community approach to smoking prevention lies in its multi-dimensionality; in the co-ordination of activities to maximise the chance of reaching all members (Sowden A, et al, 2004).

4.1 Key attributes

The CDC have suggested that the goals of community interventions can best be achieved by programmes that increase the number of organisations and individuals involved in planning and conducting community-level education and training programmes. They have recommended the use of state and local counter-marketing campaigns to promote pro-health messages that inform, educate, and support local tobacco control initiatives and policies (CDC, 1999).

The WHO has suggested key attributes for successful community interventions against youth smoking. It has highlighted the need for a configuration of key stakeholders that can strengthen the prospects of success. It has been noted that, as smoking occurs within the context of a myriad of personal and contextual risk factors, effective interventions should be undertaken in several areas. Interventions are also noted as being more effective when they take place within a supportive public environment where policies and programmes are internally coherent and apply fairly and equitably. Finally, to be effective, single tobacco control interventions often have to connect with other initiatives associated with youth attitudes and behaviours. Consequently, effective cessation efforts often have to address critical adolescent development issues, such as stress management, nutrition, and weight gain, in addition to being supported by other tobacco-specific measures (WHO, 1999).

4.2 Evaluations of community interventions

Despite the potential of community-wide programmes, debate continues about their effectiveness in influencing the smoking behaviour of young people. However, community-wide programmes are especially difficult to evaluate and many community interventions have failed to meet the criteria of rigorous scientific evaluation. The large size of many community interventions makes the measurement of implementation very difficult and expensive as qualitative methods are usually needed.

One United Kingdom review of community interventions concluded that there was review-level evidence to support the effectiveness of those community-wide interventions based on social learning theory, especially those that included various combinations of school-based activities, a mass-media component, parent involvement and community action (Naidoo B, et al, 2004).

However, a systematic review found less evidence to support community interventions. This study set strict criteria. Studies were selected on the basis that they were randomised or non-randomised controlled trials that assessed the effectiveness of multi-component community interventions compared to no intervention or to single component or school-based programmes only. Reported outcomes had to include smoking behaviour in young people under the age of 25 years. These criteria generated only 17 studies but the reviewers wanted to include the most methodologically rigorous set of studies available that evaluated the effectiveness of community interventions in influencing youth smoking behaviour. The resulting sample represented a diverse set of interventions. Four had intervention components that were aimed specifically at preventing the uptake of smoking in young people but that were part of larger, community-wide programmes to reduce cardiovascular disease in all age groups. One study included an intervention that was targeted at cancer prevention. Another community level intervention used public policy initiatives to prevent the uptake and promote the cessation of cigarette smoking. Five other interventions focused exclusively on the prevention of the uptake of smoking in young people and six interventions were aimed specifically at young people, but the focus was on the prevention of all drug use. Of 13 studies that compared community interventions to no intervention controls, two – which were part of cardiovascular disease prevention programmes – reported lower smoking prevalence (Sowden A, et al, 2004).

The first study involved an evaluation of the effect on adolescent smoking prevalence of combining a schools-based health education programme with a community-wide, population-wide cardiovascular disease risk factor reduction intervention. The programme was called the Class of 1989 study and was a sub-study of the Minnesota Heart Health Program (MHHP) that involved six cities. Schools and communities in two north central United States cities with populations of approximately 100,000 were matched for size and socio-economic factors. The participants (at baseline) who provided data for the cross-sectional and cohort studies were 2,401 11 year olds from the 13 public schools in the two communities. The intervention was based on Social Learning theory. A school programme that included tobacco-related information and

skills learning in relation to consequences, options, advertising, and resisting influences was delivered to students in the intervention classes. Peer and adult role models were used and students were involved in making a public commitment to abstain. Outcomes were obtained through use of a pretest in 1983 and annual surveys from 1984-89. In the five annual assessments weekly smoking prevalence was found to be lower in the intervention community than in the control. In 1989 this study found smoking prevalence to be 14.6 percent in the intervention city compared with 24.1 percent in the control city. The results from the saliva samples (taken from a random sample of students in half the classes in 1986) were similar to the self-reported data. A further intermediate outcome was that significantly fewer participants in the intervention groups intended to smoke in the future (Perry C, et al, 1994).

A second study that indicated a reduction in smoking in the intervention group compared to the control also involved the evaluation of a smoking prevention programme for young people, implemented simultaneously as an adult community-wide cardiovascular disease prevention programme. The North Karelia Project was a community-wide cardiovascular disease prevention programme in Finland that began in 1972 and ran for eight years and included intense mass communication and community organisation. The interventions in the smoking prevention programme were based on a Social Influences approach. A total of 903 male and female students aged 12-13 years at baseline were involved in the study. Two pairs of schools (one urban, one rural) were selected within the intervention province of North Karelia. During 1978-1980 both pairs were involved in community-wide cardiovascular risk reduction activities. Vatiainen et al found that at the 15-year follow-up (when participants were aged 28 years) mean lifetime cigarette consumption was 22 percent lower among those in the intervention community than those in the control area ($p=0.01$) (Vatiainen E, et al, 1998).

Of three studies comparing community interventions to school-based programmes only one found differences in reported smoking prevalence. The effectiveness of a multi-component community-wide intervention (Project SixTeen) to prevent adolescent tobacco use was analysed. Sixteen communities in Oregon county with populations of between 1,700 to 13,500 people in each were used in the study. One of each pair of matched communities was randomly assigned to intervention or control. The programme was based on Social Influences theory and included the use of multiple channels to reach people in a supportive social context. The number of participants ranged from 1,303 at the first survey to 1,430 at the fourth survey. Eight communities received school-based programmes only. The other eight communities additionally received community interventions including media advocacy, youth anti-tobacco activities, family communications about tobacco through school or civic prompted parent-child activities and further activities to reduce the illegal sales of tobacco to young people. These interventions were delivered by paid community co-ordinators and both youth and adult volunteers. Project SixTeen was a three-year programme. Data was collected through successive cross-sectional surveys of all seventh and ninth grades students with an initial baseline survey and a further four annual surveys. Postal questionnaires were sent to parents enclosing \$10 and included questions about awareness of anti-tobacco information; efforts to prevent youth access to tobacco; attitudes and interactions related

to tobacco and adolescent use; and community support for tobacco use prevention. Community co-ordinators monitored weekly the number of community activities. Samples of expired air carbon monoxide (CO) were taken from students. One year after the end of the three-year programme there was a statistically significant effect on smoking prevalence in the past week. The covariate adjusted prevalence increased from 7.9 percent to 13.8 percent in the school-only condition and from 10.3 percent to 12.4 percent in the school and community condition, a net difference of 3.8 percent (confidence interval 0.02-7.3 percent). However, when samples of expired air CO were compared there were no statistically significant differences between groups (Biglan A, et al, 2000).

A United States study evaluated the effectiveness of a comprehensive community-based drug prevention programme, the Midwestern Prevention Project (MPP) in reducing the prevalence of gateway drug use in adolescents. A total of 20 schools in the greater Kansas City area were assigned to intervention and 14 to control. A further eight schools were randomly assigned to intervention or control. Participants included students aged 11 to 15 years. Parents also participated in the study. The programme was based on Social Learning theory as well as transactional and systems theories and communication theories. It was originally designed as a six-year trial, with one of four components (school programme, parent programme, community organisation and health policy change) introduced into the communities at the rate of one per year from 1984. Additionally, mass-media coverage via newspapers, television and radio was implemented each year of the study. The control schools received only the mass-media campaign and their usual health education. Data was collected from students at baseline and students and parents were followed up at one year. A self-reported survey was administered to students about cigarette use in the last month and week and other demographic characteristics. A measure of carbon monoxide in expired air was also taken. Parents completed a self report survey eliciting information about the smoking behaviours of various family members and other information relating to parental role, involvement, and family discussions regarding preventing smoking. The evaluation found that one year after the intervention began results showed that smoking rates over the previous month had increased in both groups from baseline but that the rate of increase was significantly lower in the intervention group (15 percent versus 22 percent). A further intermediate outcome was that significantly fewer participants in the intervention group compared with the control group intended to smoke in the future (Pentz M, et al, 1989).

The reviewers concluded that despite the low number of interventions that included a high standard for evaluation and despite the even lower number of studies that showed a statistically significant reduction in youth tobacco use, there is some limited support for the effectiveness of community interventions in helping prevent the uptake of smoking in young people (Sowden A, et al, 2004). They identified that the following programme characteristics should be considered by individuals involved in planning future community programmes.

- Build upon effective existing programmes.

- Programmes need to be flexible to a community's need and devised so that different components of a programme can be modified to achieve acceptability.
- Programme development should include representative samples of target groups/individuals.
- Programme messages and activities should be guided by theoretical constructs about how behaviours are acquired and maintained (eg, Social Learning Theory).
- Community activities must reach the intended audience.

5. Key points

A summary follows of the findings of the literature on interventions against smoking initiation. Using this summary, and the previous identification of risk and protective factors, Part Seven of this report will comment on implications arising from the literature and will identify key areas that might need to be addressed as part of a youth tobacco strategy.

In the following summary, interventions are grouped under headings that reflect the various stages of adolescent smoking. This is somewhat difficult to do as the literature does not discuss whether interventions are aimed at preventing initiation or the transition to regular smoking. In most cases, there would not be such a dividing line, with interventions overlapping in their overall objectives of prevention. However, it is understood that there is a desire to ascertain how risk/protective factors are linked to interventions as part of the analysis for the youth strategy. Therefore, having analysed in Part Three the risk and protective factors that apply to the various stages of adolescent smoking, the interventions that appear most suited to address those factors are also discussed under some of the same headings.

5.1 Societal context

As noted previously, tobacco industry advertising, media influences, access to tobacco products and the degree of public smoking are societal influences that impact on adolescent smoking. Research has shown that these risk factors are particularly prominent in the contemplation and initiation phases of smoking.

Legislation: International literature on youth access laws has shown that active enforcement will decrease the number of outlets selling cigarettes to young people. To improve the enforcement of tobacco control laws it has been suggested that a graduated penalty structure be adopted and that tobacco vendors be licensed. Furthermore, enforcement must be intensive and ongoing. The costs associated with achieving high levels of compliance are substantial and there is not strong evidence available that an

increase in compliance is associated with a decrease in smoking prevalence as adolescents access cigarettes from a number of social sources. However, access laws are necessary in shaping community norms around tobacco, and are required to be implemented by Parties to the Framework Convention on Tobacco Control. To ensure access measures are effective they need to be integrated within a comprehensive tobacco control programme, the components of which reduce the availability of social sources and limit the appeal of tobacco products.

Fiscal regulation: As well as increasing smoking cessation, in the case of youth tobacco use pricing interventions aim particularly to impact on ‘never smokers’ and reduce smoking initiation. Increased taxation is thought to be effective as teenagers are considered to be more responsive than adults to changes in cigarette prices. This is because the proportion of disposable income a young smoker spends on cigarettes is likely to be higher than that spent by an adult smoker. Although comparatively few studies have focused on teenage cigarette demand, review-level evidence has demonstrated the effectiveness of price increases for reducing tobacco use among both adolescents and young adults.

Mass-media campaigns: As mass-media campaigns aim to change social norms at a societal level by altering knowledge, attitudes and beliefs that individuals hold regarding smoking, they are particularly useful in the contemplation phase of smoking. Campaigns have the potential to reach large segments of the population including those most at risk of smoking initiation. Mass-media campaigns combine elements of highlighting health risks, of showing how smokers are deemed to be undesirable, and of criticising the tobacco industry. International literature has suggested that the most successful campaigns were those that used research and theory-based formative design principles and that targeted at-risk audiences. Campaigns need to generate substantial levels of exposure, aimed at the widest possible geographic area (eg, national vs. community) and run for extensive periods of time.

Although there were varied opinions in the literature as to the most successful smokefree messages, it was noted that campaigns having the most impact were those that focused on reasons why non-smoking teenagers did not smoke, those that produced negative visual images associated with smoking and those that portrayed smokers as lacking independence and social skills.

The literature highlighted the difficulty of evaluating the effectiveness of mass-media campaigns on youth tobacco use. In particular, there was difficulty in identifying the independent effect of anti-tobacco campaigns compared with other factors that might influence usage. Authors generally agreed that for mass-media campaigns to be effective they needed to run concurrently with other tobacco control policies.

5.2 Initiation

Primary healthcare: One of the most potentially cost-effective interventions against initiation was the delivery of tobacco control messages to adolescents through primary healthcare services. The greatest area of potential was through providers such as nurses and general practitioners. All had the potential as part of their practices to screen families and adolescents for risk factors and provide suitable advice or arrange appropriate referrals. Restricting this potential were several limiting factors including inadequate training on tobacco prevention, lack of knowledge regarding clinically effective anti-smoking interventions and lack of models on how to incorporate anti-smoking interventions within a practice situation.

School-based programmes: Interventions delivered at, or through, school environments aim primarily to prevent initiation; although they also have an important role in seeking to stop transition to regular smoking. Internationally, school-based interventions to address tobacco use are widespread. The primary advantage of this type of intervention is that almost all children can be reached through schools. In general it can be said that these programmes seek to teach social competence (by generally developing personal and social skills and goals) or social influence (by teaching skills to resist tobacco use).

Despite the widespread use of school-based programmes, there is continuing uncertainty about their relative and absolute effectiveness. Although past research has suggested that such programmes result in a significant short-term reduction in smoking, a delay in initiation and a desirable change in attitudes toward tobacco use, recent analysis have brought these findings into question. The primary difficulty is that a myriad of different programmes with varying theoretical basis have been adopted. Furthermore, the evaluation of most of these programmes either has not taken place or has been undertaken with little rigour. A recent systematic review found that while half did seem to have some positive effect on adolescent smoking prevalence, the other half did not. The need for review of how school-based programmes should be designed, utilised and evaluated has been recommended.

5.3 Addicted/dependent smoking

As previously noted, most interventions discussed in international literature have the potential to impact on various stages of adolescent smoking. However, just as mass-media campaigns are most effective in influencing contemplation and school-based programmes may be aimed more at preventing initiation, the objective of community interventions is to achieve individual behaviour change that supports the non-use of tobacco. As such, it is potentially the most useful intervention type to address adolescent smokers as they progress towards a regular and persistent smoking stage.

During the complex process of moving from experimentation through to regular smoking there appear to be a number of risk and protective factors that might come into play (see

PART THREE, Key points). This provides a number of opportunities for interventions. However, the width of potential risk and protective factors increases the need for a number of organisations and individuals to be involved in planning and conducting community-level programmes. Interventions need to be built to operate within a number of settings including the home, workplace, school and community.

A diverse set of interventions have been developed internationally to operate at the community-wide level. This has presented some difficulty in evaluating the effectiveness of the interventions. It has been noted that the large size of many community interventions makes evaluation very difficult and expensive as qualitative methods are usually needed. Of those evaluations that have taken place, many have not been scientifically rigorous in their design. Having said this, systematic reviews have identified that the limited number of community-wide interventions found to be most effective are those based on social learning theory and that include various combinations of school-based activities, a mass-media component, parent involvement and community action.

PART SIX: YOUTH COMPONENTS WITHIN OVERSEAS TOBACCO STRATEGIES

In this part of this report, international tobacco control strategies will be examined. Due to the time available to this project the review is limited to Australia, Canada, United Kingdom, and the United States of America. With the exception of Australia, the strategies examined are at the national rather than province or state level. Furthermore, a broad overview of the components is outlined rather than a detail of the actual interventions. Where an evaluation has occurred, these are recorded.

1. Australia

Although Australia has been committed to a comprehensive approach to tobacco control since 1991, tobacco smoking remains the single largest preventable cause of premature death and disease in Australia. This led to the development of a National Tobacco Strategy outlining a comprehensive approach to tobacco control in Australia, implemented from 1999 to 2002-03. The National Strategy was intended to expand on the range of initiatives already implemented by Commonwealth, State and Territory governments and non-government organisations. It was also developed as part of an integrated approach to improving health. The development of the Strategy was to be the result of reasoned and rigorous evidence from previous tobacco control initiatives at all levels within Australia and internationally, and criteria regarding evaluations was outlined. The overall goal of the National Tobacco Strategy is to improve the health of all Australians by eliminating or reducing their exposure to tobacco in all its forms (MCDS, 1999).

An extensive range of actions relating to several key strategies were outlined in the framework. Particular policies or programmes related to youth included proposals to raise public awareness through nationally collaborative anti-tobacco education using mass media, public relations and advocacy campaigns. Although some campaigns were designed to reach the whole population, others targeted particular groups such as children, young people and their families. The National Tobacco Strategy also proposed an increase in the strategies, programmes and guidelines that educationally support and enhance State and Territory tobacco education and primary prevention initiatives. This included the development, implementation and ongoing evaluation of a National School Drug Education Strategy and a peer education programme that could be used in and out of school settings; the prioritising of tobacco issues in school programmes; and the development and maintenance of tobacco modules in school health curricula. The National Strategy also included plans to increase the range and number of preventative programmes including the development, implementation and regular review of community-based programmes that were based on research determining the best approach to meet the needs of children and young people in particular areas.

The importance of capacity building was recognised in the Strategy. The capacity of communities to contribute to tobacco control required action in identification and

strengthening of partnerships in the community to encourage the integration of local practice knowledge with research-based knowledge. The Strategy recognised the need for communities to be involved in consultation, planning and development of appropriate information and education strategies at all levels. A national audit of smoking initiatives and a national Tobacco Forum for Aboriginal and Torres Strait Islander people were also seen as necessary to increase the capacity of their communities. The Strategy indicated that strengthening communities also involved working with targeted population groups to ascertain the social, cultural and economic factors that influence initiation and continued use of tobacco.

A reduction in illegal sale and supply of tobacco to minors was aimed at through prohibiting self-service vending machines and developing, implementing and evaluating a national ‘best practice’ model in sales to minors programmes. This model involved a number of components including community and retailer education, effective monitoring and compliance checks, and enforcement. Legislative options and penalties were to be considered as part of the model.

The National Strategy aimed to reduce public exposure to messages and images that may encourage the initiation or continued use of tobacco in a number of areas including accidental and incidental advertising; point of sale advertising; and value-added products and promotions. Legislative options were also considered in reducing tobacco promotion including an audit of tobacco advertising legislation, monitoring and enforcement policies in Australia to identify the minimum agreed level of tobacco advertising restrictions to be adopted nationally and the implementation of policies, systems and training of relevant personnel to improve monitoring and enforcement. The Strategy involved a completion of the removal of the tobacco exemption for sporting and cultural events of international significance by the year 2006.

1.1 Aboriginal and Torres Strait Islanders

Aboriginal peoples and Torres Strait Islanders were identified in the National Tobacco Strategy as one of six population groups that need to be targeted with specific national tobacco control efforts. Smoking prevalence among the Aboriginal and Torres Strait Islander population was approximately 54 percent, which was twice as high as levels in the overall Australian population (Lindorff K, 2002).

To address this the National Aboriginal and Torres Strait Islander Tobacco Control Project was funded under the National Tobacco Strategy to investigate the key issues around tobacco use as determined by communities, and to make recommendations of ways to address these issues.

The key recommendation to come from the Report was that national co-ordination for Aboriginal and Torres Strait Islander tobacco control be implemented without delay. It noted the necessity for dedicated funding and the further need for collaboration and representation from Aboriginal community-controlled health, Torres Strait Islander

community-controlled health, tobacco control, and government and non-government organisations.

Tobacco use by children was specifically discussed by the focus groups and all communities expressed a high level of concern for the early uptake of tobacco use by children. The need for appropriate, ongoing and comprehensive programmes for children was a priority for every focus group. It was noted that programmes needed to start early in primary school, be well resourced, and continue through all levels. There was also a need for programmes outside the school. Further suggestions included using peer education and the use of local sporting or other heroes as role models.

1.2 Australian Capital Territory

In August 2004 ACT released the ACT Alcohol, Tobacco and Other Drug Strategy 2004-2008. The strategy outlines a series of actions aimed at reducing the harm associated with the mis-use of alcohol, tobacco and other drugs in the ACT community over the next four years. Tobacco use among youth is specifically addressed by several strategies including the introduction of peer-based school drug education programmes and the introduction of a tobacco compliance programme to target the illegal supply of tobacco to minors.

The ACT Strategy takes particular note of the social context of tobacco, alcohol and other drug use. The plan indicates that approaches to addressing drug problems (including tobacco use) need to not only support and treat people who have developed harmful patterns of use but also address patterns of social deprivation. The Strategy also recognises that factors such as race, gender and socio-economic issues influence both people's experience of alcohol and other drug problems as well as the sort of responses that are most effective and appropriate in addressing these problems.

1.3 New South Wales

The New South Wales Government has committed to a *Tobacco Action Plan 2001-2004* that sets out their strategies to prevent and reduce tobacco-related harm in New South Wales. Young people are a priority group and the Plan outlines an extensive range of strategies specifically directed at preventing youth smoking and protecting them from second-hand smoke. These strategies incorporate public education campaigns; telephone line support for young and potential smokers; the implementation of effective sales to minors legislation; enhanced training in tobacco issues for people who work with young people; addressing exposure to environmental tobacco smoke (ETS) in the home; the implementation of effective tobacco advertising legislation; and the further implementation of legislation to address smoking in enclosed public places.

1.4 Northern Territories

The Northern Territory Government has established the Tobacco Action Project (TAP) to reduce smoking and exposure to second-hand smoke among Territorians. The two major target groups for this project are young people and Aboriginal people. A number of policies have been put in place to reduce initiation and continued smoking among youth. The Tobacco Control Act 2002 prohibits the sale and supply of tobacco products to children under the age of 18 years. This Act is supported by retailer education programmes conducted by TAP. TAP is also involved with checking compliance with the law by retailers. To assist retailers in complying with this law a proof-of-age card called the 18+ Card was developed.

TAP has also developed a number of media campaigns targeted at youth and run in the Northern Territories. These include the 'Choose Yourself Campaign' and 'Smarter Than Smoking'. These used a range of media. The Smarter than Smoking campaign established an ongoing website that deals with a variety of tobacco-related issues relevant to youth such as quitting, second-hand smoke, and the manipulation of youth by the tobacco industry. TAP works in schools providing education and helping them to develop smokefree policies. Another initiative is the 'Health Promoting Schools Grants' awarded to schools to coincide with World No Tobacco Day. They also provide education through community groups (Northern Territory Government).

1.5 Queensland

In 2000 Queensland launched its first ever strategic tobacco plan *Towards a Smokefree Future 2000/2001 to 2003/2004* in response to the National Tobacco Strategy. The plan created a framework for government, non-government agencies and other stakeholders to collaborate in reducing the impact of smoking on the community. In response to the increasing Queensland youth smoking rate (15 percent in 1990 to 21 percent in 1996) the Queensland government undertook to instigate a series of legislative and educational initiatives to address smoking among young people. Actions included legislation restricting tobacco sales to minors; restricting the placement of self-service tobacco vending machines to bar and gaming areas of liquor licensed premises; introducing tobacco advertising legislation; implementing youth drug campaigns; providing enhanced training for school-based Youth Health Nurses; and delivering drug education in Queensland schools (*Towards a Smokefree Future Queensland Tobacco Action Plan 2000/2001 to 2003/2004*).

1.6 South Australia

In South Australia key components of the national and state strategic anti-tobacco plans are delivered through Quit South Australia (formerly the South Australian Smoking and Health Project). The South Australian Smoking and Health Project was established in July 1989 as a joint initiative of the Anti-Cancer Foundation of South Australia (now The

Cancer Council South Australia) and the National Heart Foundation (SA Division). Since 1998, when \$3.9 million/year was allocated for tobacco control activities, funding for Quit South Australia has come, in the main, from the Department of Human Services (now Department of Health). Their programmes are developed based on the principles of the Ottawa Charter for Health Promotion and the best available evidence of what is effective. Their goals to preventing tobacco use among young people are to both raise the awareness of educators and people working with youth and to provide them with the necessary resources and support to implement tobacco control programmes. They also work with young people to provide them with a range of opportunities to gain the information, skills and attitudes that will enable them to be non-smokers and support and encourage them to quit smoking. Further activities include promoting smokefree environments for the whole community including young people and supporting legislative and enforcement measures to limit the sale of tobacco products to minors.

Initiatives include, among others, a Youth Free Tobacco Day and OxyGen, an anti-tobacco internet site. A range of resources have been supplied to schools including the introduction in 2004 of Keep Left, an innovative approach for schools to assist young people who smoke to quit, cut down or manage their smoking so they don't smoke at school; and Critics' Choice, a resource aimed at encouraging primary and secondary students to watch, critique and discuss 12 anti-tobacco TV commercials from Australia and overseas.

South Australia is also making legislative changes in the area of tobacco control. Amendments to the current Tobacco Products Regulation Act are currently progressing through the South Australian Parliament. The bill seeks to ban smoking in enclosed workplaces, facilitate a staged introduction of smoking bans in pubs and clubs, as well as prohibit the display of tobacco products at point of sale (Cancer Council, 2004).

1.7 Tasmania

The results of a project to examine and develop effective approaches and strategies to achieve behaviour change in relation to risk-taking behaviours in Tasmanian young people was published in March 2004. The project focused on creating specific proposals for actions and concepts that would assist in reducing the smoking behaviour of nine to 17 year olds (Department of Health and Human Services, 2004).

The project was completed in four stages involving a review of relevant literature and programmes; consultation and testing of existing concepts with youth; the contracting of an advertising agency to further develop the creative components of the campaign that would give direction to further strategies; and the development of a strategy paper to reduce the smoking rates of Tasmanian youth.

One of the conclusions based on findings from the Literature Review was that there was a need for a comprehensive and collaborative mass-media effort to be considered alongside other multi-faceted strategies such as targeted initiatives for schools and communities; the elimination of tobacco advertising and displays at the point of sale; smokefree public

places; regular price and tax increases; enforcement of prohibitions on the sale and supply of tobacco products to people under the age of 18 years; and other external measures.

After testing of initial proposals through nine focus groups set up state-wide and further consultation with the Advisory Committee set up to oversee the project it was finally accepted that the *Smoking? You Joking?* theme should be the central brand and message. Further recommendations accepted by the Advisory Committee regarding the campaign included television and cinema advertisements with a *Pass it on* theme; a *Friend or Fiend* educational kit to be used in schools; posters using the concept *It's Just Not Natural* and further use of a concept they labelled as Tactical Alternative Guerrilla Media (TAGM) in unexpected locations, for example, video covers with 'Warning: Movies that feature smoking can damage your attitude'. The *Smoking? You Joking?* logotype was recommended to be used on promotional items supplied by Quit Tasmania and a further range of promotional items including caps, stickers, pens, frisbees and tattoos was also planned as part of the campaign. Recommendations also included a big campaign launch and plans for ongoing evaluation were outlined.

1.8 Victoria

Victoria's anti-tobacco strategy outlined in their National Tobacco Action Plan comprises the regulation of the sale and display of tobacco products, the reduction of environmental tobacco smoke through legislation, as well as a range of tobacco education and smoking cessation interventions. It is a response to the Australian National Tobacco Control Strategy (Victorian Government Department of Human Services, 2002).

Victoria's political, promotional and educational activities relating to anti-tobacco issues are mainly run by a programme called Quit (housed within The Cancer Council Victoria). The Victorian Smoking and Health Program (Quit) was established in 1985 by the Minister for Health and The Cancer Council Victoria. Representatives from the Department of Human Services Victoria, The Cancer Council Victoria, the Victorian Health Promotion Foundation and the National Heart Foundation oversee the Quit campaign and advise the Minister for Health on policy and legislation that will reduce the impact of tobacco use in Victoria. Quit receives around \$2.3 million annually from the Victorian Health Promotion Foundation as well as funds from the Victorian Department of Human Services, The Cancer Council Victoria and the National Heart Foundation (Victorian Division).

1.9 Western Australia

The Western Australian Tobacco Action Plan identifies youth as a priority group. Strategies include continuance of the quit campaign and taking a tougher stance on tobacco control overall, including pressing for greater controls on tobacco promotion and point-of-sales issues. Funding was also allocated to a campaign calling for community

action to address the sales of tobacco products to children. A further strategy addressed the issue of smoking and fertility among young men and women.

Healthway is a statutory body established under the Tobacco Control Act 1990. Healthway receives approximately \$17 million annually to provide sponsorships and grants. Of this, health promotion projects and health promotion research grants are each allocated approximately \$2.4 million. Additionally, Healthway provides more than \$8 million per year for sponsorship of sport, arts and racing programmes and \$1.7 million to support sponsorships. Tobacco smoking control has been identified as a priority for Healthway in the West Australia 2004-2007 Strategic Plan and at present tobacco control receives more Healthway funding in health projects, research and sponsorship than does any other issue. Healthway's commitment to this area complements a range of other government and non-government organisations involved in tobacco control research, projects, sponsorships, policy, advocacy and other initiatives that contribute to a comprehensive approach to tobacco control in Western Australia (Healthway, 2004).

2. Canada

In 1999 a Canadian National Tobacco Control Plan was endorsed by all Ministers of Health. In April 2001 the Government announced a Federal Tobacco Control Strategy (FTCS) to provide a concrete plan of action supported by funding for implementation as the Government's contribution to the National Plan. The strategy focuses on the mutually reinforcing components of protection, prevention, cessation and harm reduction and involved the effective use of public education campaigns (Health Canada, 2004).

The FTCS is comprehensive and includes various strategies to create an environment (physical, legal and regulatory) that supports non-smoking as the norm in Canada; tobacco taxation policies; collaboration with provinces, territories and NGOs; support for those who want to quit smoking; and further investigation regarding possible changes to tobacco products to reduce hazards to health and the provision of tobacco product information. A number of strategies have also been initiated or are being developed to discourage people from taking up smoking, including a range of programmes specifically aimed at youth. These programmes use a variety of approaches and methods including educating and informing youth about the dangers of tobacco use and second-hand smoke and engaging youth in the delivery of programmes to their peers. The FTCS includes the use of high-profile, ongoing mass-media campaigns aimed at all age groups but with a specific focus on youth and other at-risk target groups. Media campaigns involve the use of a range of media including the internet and build on successful elements from previous initiatives.

Over the first year achievements, specifically in the area of youth and smoking, included the development of school-based learning resources and toolkits for youth engagement - 'Science, Tobacco and You', an interactive CD for grade 4-6 students (and close to a 70 percent conviction rate for tickets issued in the field, for contraventions of the youth

access provisions of the *Tobacco Act*). Two comprehensive tobacco control websites garnering more than 35,000 hits a month were established and eight media campaigns were launched incorporating the use of various media such as television, brochures and posters. Several of these were aimed at preventing second-hand smoke; others used athletes as role models and several were aimed at aboriginal communities. Most of these were aimed at a variety of ages within the population but some had a specific youth orientation.

Health Canada is provided with ideas and input on issues and activities in tobacco control from a youth perspective by the Youth Action Committee. This is a nationally representative team of 21 members (ages 14 to 19) from across Canada. This group reflects the diversity of the Canadian society and includes males and females; Francophones and Anglophones; Inuit and First Nations; persons with disabilities; new Canadians; and a mix of smokers, former smokers and non-smokers. The group meets once a year and has regular teleconferences and individual members are also involved in health and tobacco groups in their own provinces and territories as well as in their communities and schools (Health Canada, 2004).

Other more recent youth initiatives by Health Canada reported on the youth website were a 2003 contest, 'Smoke, Lies and Videotapes', which encouraged youth to create a public announcement on second-hand smoke; and a 'Speak Your Mind' internet contest also on the issue of second-hand smoke. The website, as well as providing facts on smoking and health statistics, smoking related issues and quitting advice, also provides information regarding the tobacco industries' manipulation of youth in a similar way to the Florida 'Truth' campaign (Health Canada, 2004).

3. United Kingdom

In 1998 the United Kingdom published a governmental White Paper that detailed a package of measures for a concerted campaign to reduce smoking. This was in response to a levelling off in the number of adults who had stopped smoking and an increase in the rate of young people, particularly young women, taking up smoking. This was also part of a larger campaign to improve public health that had been outlined previously by the Government.

Several actions were already in place at the time the White Paper was published including plans to end tobacco advertising and sponsorship. A further existing governmental policy that the Government saw as supporting the White Paper initiatives was a commitment to raise tax on tobacco products.

The proposals included three objectives, one of which was to reduce smoking among children and young people. The Government support for the new programmes, outlined in the White Paper, was for over £100 million over three years.

The strategies aimed at both reducing initiation and preventing continued smoking among young people included several initiatives. Firstly, a policy on minimal advertising in shops was developed. A second initiative involved tough enforcement on under-age sales. Although it was illegal in the United Kingdom to sell cigarettes to those under 16 the law was not enforced effectively and consequently most children who smoked said they purchased their cigarettes at shops. The Government indicated that as part of dealing with the tough enforcement of under-age sales, magistrates and trading standards officers needed to consider in greater detail the issues surrounding such offences and the ways in which cases could best be presented to courts as prosecutions for selling tobacco to under-16s were relatively rare. The Government also indicated that new measures were being investigated to stop repeat offenders, or their staff, from selling tobacco, and further consideration was being given to the possibility of new criminal sanctions in relation to this issue.

The third strategy proposed by the White Paper was the introduction of a proof-of-age card. This initiative appeared well-supported by retailers.

Finally, the White Paper indicated that there was a need for the introduction of strong rules relating to the siting of cigarette vending machines. This need was based on evidence from an Office of National Statistics survey, which showed that one in three school children in England who smoked said that machines were one of their usual sources of cigarettes. It was noted that although other studies had indicated lower levels, vending machines were viewed as a significant source of cigarettes for school children.

Other strategies outlined included: ending tobacco advertising; changing attitudes; reducing tobacco smuggling; and research. A need to introduce a ban on tobacco advertising was found to be necessary because the voluntary code did not appear to be working. More than 95 percent of children reported seeing a tobacco advertisement in the last six months and smoking among children and youth was increasing. There was also evidence that most people wanted a broad ban on tobacco advertising.

The White Paper provided evidence that public education programmes were the most direct way of changing attitudes and behaviour. It outlined the Government's plans to commit some £50 million over the next three years to develop a sustained and co-ordinated new campaign to combat smoking. A particular campaign was proposed to be directed towards young people persuading them to think twice before smoking. The importance of using media types, style and design that were appropriate for the target audience was recognised and collaborating with the publishers of teenage magazines was seen to be essential in targeting young people.

In addition to the national campaigns, the Government intended using key local players including schools, health authorities, local authorities, businesses, and voluntary and youth groups to support the messages. Other school initiatives involved continued education programmes by teachers and school nurses; the inclusion of anti-smoking education in national criteria for membership of the Health Schools Award Scheme; and the provision of good practice guidelines for tobacco and drug education. In addition, an

advisory group had been set up by the Department for Education and Employment and the Department of Health to develop a national framework for personal, social and health education in schools and to consider its relationship to other curriculum areas. This education programme would include a skills-based programme for resisting the pressure to smoke. Further strategies were also expected from the Government's Women's Unit who at that time were investigating ways of reducing self-damaging activities among teenage females.

In relation to children the immediate aim was to stop the rise in children smoking and then to reduce smoking levels in this group. Their overall target was to reduce smoking among children from 13 percent to 9 percent or less by the year 2010; with a fall to 11 percent by the year 2005. Achieving this target would mean approximately 110,000 fewer children smoking in England by the year 2010.

Surveys on the smoking behaviour of 11 to 15 year olds were completed every two years from 1982 until 1998 and then annually. In 2002 data for the report came from 9,859 questionnaires completed by mainly 11 to 15 year olds from 321 schools in England. The survey found that although the proportion of regular smokers (defined as usually smoking at least one cigarette a week) had fluctuated since 1982, it had been quite stable since 1998 at between nine percent and 11 percent. Over 2001 and 2002 the proportion of regular smokers was 10 percent and 2003 headline data showed a decrease to nine percent. As in previous years, the 2003 data indicated that, overall, females are more likely to be regular smokers than males - 11 percent compared with seven percent. The 2002 report provided further information on initiation noting that, since 1986, the proportion of pupils who had ever smoked has been between 42 percent and 50 percent. The 2002 data indicated an 'ever smoking' level of 42 percent in 2002 and it was noted that since 1998 there had been a generally downwards trend in the proportion of children who had ever smoked.

The surveys also examined the sources that the students used to obtain cigarettes. Although there has been a decrease from a peak of 89 percent in 1996 to 77 percent in 2002, the purchase of cigarettes from shops was still the main source of cigarettes for young smokers. Further information on this issue indicated that between 1990 and 2002, the proportion of pupils who had attempted to purchase cigarettes from a shop in the last year decreased from 32 percent to 18 percent. A decrease was found among all ages, with a greater decrease among younger pupils. The survey results indicated that there was a slight increase among current smokers (includes both regular and occasional smokers) in the proportion who felt it was difficult to purchase cigarettes from a shop, from 18 percent in 1996 to 23 percent in 2002. Among those who had attempted to purchase cigarettes from a shop in the last year the proportion that had been refused at least once increased from 37 percent in 1990 to 48 percent in 2002, and an increase was seen among all age groups.

Another important action in reducing smoking among young people mentioned in the White Paper was the introduction of strong rules regarding the siting of vending machines to prevent children using them as a source of cigarettes. The 2002 report

indicated a decrease from a peak of 25 percent in 1996 to 11 percent in 2002 in the proportion of 15 year olds that had ever bought cigarettes from a machine. A slight downward trend was also indicated in younger age groups who already were less likely to buy cigarettes from a machine.

Another feature of the White Paper was a public education campaign including some changes in the delivery of school programmes. The 2002 report noted that the proportion of pupils who remembered having lessons on smoking has fluctuated over the years; the proportion increased from 42 percent in 1986 to a peak of 78 percent in 1998, decreased to 63 percent in 1999, and has remained relatively stable since then (in 2002, 65 percent of pupils remembered having lessons on smoking) (Blenkinsop S, et al, 2003).

4. United States

The United States National Tobacco Control Program (NTCP) was created by the CDC Office on Smoking and Health (OSH) to encourage co-ordinated, national efforts to reduce tobacco-related diseases and deaths. The NTCP provides funding and technical support to State and territorial health departments in line with four goals: (1) eliminating exposure to environmental tobacco smoke, (2) promoting quitting among adults and youth, (3) preventing initiation among youth and (4) identifying and eliminating disparities among population groups. The NTCP is made up of four components: population-based community interventions; counter-marketing; programme policy/regulation; and surveillance and evaluation.

The NTCP works through best practice guidelines for comprehensive tobacco control programmes established in 1999. These recommend that states establish tobacco control programmes that are comprehensive, sustainable, and accountable. The 'best practices' outlined are determined by evidence-based analyses of comprehensive state tobacco control programmes. They are addressed through nine components and include an extensive range of activities that have been found to be effective. Smoking initiation may be affected by a variety of these strategies. However, some of the strategies specifically aimed at youth include using local community programmes to include youth in developing and implementing tobacco control interventions and conducting educational programmes for young people, parents, enforcement officials, community and business leaders, health care providers, school personnel, and others. The 'best practice' guidelines indicate the implementation of school programme activities that follow CDC's *Guidelines for School Health Programs to Prevent Tobacco Use and Addiction*. These Guidelines call for tobacco-free policies, evidence-based curricula, teacher training, parental involvement, and cessation services. Other school activities include implementing evidence-based curricula identified through CDC's Research to Classroom Project; and linking school-based efforts with local community coalitions and state-wide media and educational campaigns.

The importance of enforcing tobacco control policies regarding restrictions on minors' access to tobacco and smoking in public places are included in the best practice guidelines.

PART SEVEN: A WAY FORWARD

This literature review has considered youth smoking prevalence rates in a number of countries, as well as risks and protective factors, and key interventions. With reference to the findings in the literature review, recommendations will be made for future actions appropriate to the New Zealand context.

Interventions that target both the reduction of risk factors and the enhancement of protective factors are necessary to reduce the likelihood of smoking initiation.

It is noted also that there are several policy and legislative contextual issues that also need to be considered when developing a strategy for reducing smoking initiation. These include the following.

- Obligations for New Zealand under the Framework Convention on Tobacco Control. New Zealand has ratified this international treaty and will be obliged to meet all obligations under it (both legislative and non-legislative) when it comes into force.
- The requirements of the Smoke-free Environments Act 1990 and regulations made under it. The Ministry of Health is obliged to ensure that the legislative controls under this statute are applied and enforced.
- Government-level strategies including, without limitation, the New Zealand Health Strategy, National Drug Policy, He Korowai Oranga (Māori Health Strategy), Pacific Health and Disability Action Plan and Reducing Inequalities in Health programme.
- International guidelines on best practice in tobacco control.

1. Socio-demographic research needs

Before considering the possible components of a youth strategy, information gaps in the New Zealand context will be identified that could benefit from targeted research efforts.

Sex: Reasons for smoking are different for males and females and these differences have been discussed in the literature as being related to the dynamics of group membership as well as the importance of imagery. However, the picture is not completely clear, with some international studies concluding that sex does not bring any significant differences in relation to adolescent smoking initiation. Considering that a higher prevalence of cigarette smoking exists among teenage females when compared to males there is a need to have a clear understanding of the dynamics associated with female adolescent tobacco initiation. Further analysis may be required in the form of qualitative research to elucidate the reasons associated with smoking initiation.

Ethnicity: A similar situation exists in relation to the association of adolescent smoking with ethnicity and cultural variables. Although the international literature records varying results as to the importance of these factors, there has been some qualitative work that has demonstrated important differences. This research has shown that in addition to commonalities associated with smoking initiation that are shared across all ethnicities, there were important subtexts between different groups, which identified varying processes influencing smoking initiation. Research is required to ascertain whether the same situation exists in New Zealand and to ascertain the nature of those subtexts. The research also needs to take into account any impacts of acculturation.

2. Societal context

The types of risk and protective factors and interventions that influence the societal context have been discussed in previous sections. The implications arising from that discussion follows.

Youth access laws: Given the increasing international debate on the effectiveness of youth access laws, there is a need to examine where New Zealand's programme sits. Matters to be considered relate to measures of merchant compliance, level of enforcement, role of merchant education and evidence of whether the youth access regulatory environment lessens sales to under-age youth and whether it actually lessens prevalence of use.

Social sources: The importance of social sources in jurisdictions that have strong youth access laws and good enforcement has been demonstrated by international evidence. United States research has also identified the different avenues of social sources that are important to the various stages of adolescent smoking development. As social sources pose such an important threat to youth access regulation and as there is some controversy surrounding the efficacy of this type of regulation, New Zealand research to determine the local nature of social sources in relation to the various stages of tobacco development would be important in ensuring the right types of interventions were developed in response.

Increased taxation: With evidence that increased taxation would be effective against adolescent smoking, consideration needs to be given as to the appropriate level of taxation rise. Furthermore, increased taxation, while being one of the most effective interventions, is also a politically risky intervention for which there is often reluctance to implement. Policy work is required to build a clear case for the intervention and to design an implementation strategy that would manage the political risk. Findings also indicated a need for policy makers to minimise the potential financial hardship to socio-economically deprived households that is attributable to tobacco taxation, by focusing tobacco control programmes that are culturally appropriate on populations with the highest need. They noted that in New Zealand this may mean expanding tobacco control programmes that are designed for lower socio-economic groups or Māori.

Tobacco industry influences: Most of the international literature that assesses the impact of tobacco industry advertising on youth and adolescent smoking occurs in a tobacco control environment that is dissimilar to New Zealand. Furthermore, the normative values and expectations and the acceptance of tobacco control in New Zealand may vary greatly from overseas jurisdictions that have been studied. Research is, therefore, required on what types of tobacco industry advertising and promotions are available to New Zealand youth and what impacts these are having. This would provide a basis on which to design appropriate interventions.

Film influences: The international literature on tobacco use in film has recorded that a number of films have ratings that allow children and young adolescents to view significant tobacco use. It has been suggested that a change in rating would make a large difference to the number of films seen by young adolescents and children that depict tobacco use. The matter of considering film ratings could be considered here. Once again policy work would be required around this proposal.

Work environments: The impact of work environments may require a need to ensure that interventions address the needs of working students and that workplace prevention policy and programmes specifically take into account and provide a focus on younger workers.

Public smoking: The literature demonstrates that adolescent perceptions of the prevalence of smoking in society tend to be inflated. Smokefree environment regulation could be used to further restrict smoking in certain locations to reduce the visibility and perceived acceptability of smoking in public.

Mass-media campaigns: The supposed prevalence of smoking in society and the links made in films and other media with positive imagery associated with smoking can be challenged through the use of mass-media campaigns. Mass-media campaigns tend to be aimed at never smokers to influence contemplation and delay initiation. The smaller size of New Zealand presents the opportunity of running nationwide mass-media campaigns. The international literature has identified that larger scale mass-media interventions have more impact than smaller community campaigns. Instead of viewing campaigns as isolated public health interventions planned and run in an ad hoc manner, a clear longer term programme is needed. This would allow for a staged implementation of components of the programme, with each having specific communication objectives. In addition, available research promotes the use of mass-media campaigns as being linked into, and a part of, a clear and comprehensive youth tobacco control programme. Differentiation of target groups appears important, with messages being designed that recognise the needs and interests of these groups.

Campaigns would require formative research to develop clear messages. Messages highlighting health impacts are of less effect; research has shown that information on health effects is not a strong protective factor for youth. Although the industry manipulation approach has been successful in the United States, its transferability to the New Zealand context would have to be carefully considered. On the other hand,

messages showing the undesirability of smokers have been used successfully in past campaigns.

Sufficient, secure, longer-term funding would be necessary if this intervention was adopted, as both intensity and duration of campaigns are clearly key factors for success. Evaluation of the campaigns using suitable, possibly qualitative research methods, is important to accurately measure actual impact on youth tobacco use.

When considering the use of mass-media campaigns, several factors need to be considered and weighed against each other. These include the potential to reach a significant proportion of the population, the comparatively large amount of resourcing required to run and evaluate sustained campaigns and the difficulty of ascertaining in isolation the effect the campaign has had.

It will also be important to ensure that the development of mass-media campaigns is consistent with Ministry of Youth Development efforts to develop guidelines and best practice on the design, implementation and evaluation of drug education programmes.

3. Initiation (stages 1 – 3)

The literature has demonstrated that the most prominent risk factors for initiation are peer smoking, family environment, the nature of access to tobacco products, lower self-esteem/self-concept and participation in risk-taking behaviours. In contrast, doing well within the school environment, participation in community or sports clubs, religious involvement and family connectedness were protective across all cohorts.

The school environment: The potential of the school environment to enhance protective factors and manage risk factors remains high. Almost all children can be reached through schools and daily contact is made throughout the years when initiation is at most risk of occurring. Although programmes offered through schools use social competence and social influence approaches, it would appear that several of the protective factors are related to the general school environment. Scholastic achievement and participation in activity groups and sports have been found to be very important protective factors. Schools need to be made aware of how these protective factors are linked to preventing tobacco initiation and a programme devised to promote achievement and participation at a number of levels. Much of the work that can be done through schools might not focus directly on tobacco use. For example, the implications arising from the body of work on the connections between weight control and smoking for adolescents suggests the need for interventions to address healthy methods of weight maintenance. The promotion of healthy lifestyles would also address risk factors associated with other negative health behaviours while dealing with other public health requirements in which schools need to play a role (such as sexual health and nutrition programmes).

School-based programmes: In relation to specific tobacco prevention programmes delivered at or through schools, the international literature has demonstrated the problems

that have developed through the widespread use of these types of interventions. A myriad of programmes, using different theoretical basis and lacking a rigorous evaluation component, has meant that no clear direction has developed on what works best in which situations. In a small country like New Zealand, it should be possible to develop a viewpoint at the policy level on the most successful types of interventions within the school environment and introduce some greater structure and rigour to the provision of school-based programmes. In 2003, the Ministry of Youth Affairs commissioned Allen & Clarke Policy and Regulatory Specialists Ltd to produce a comprehensive review of literature on best practice for effective drug education. The literature review (<http://www.myd.govt.nz/pag.cfm?i=394>) covered strategies and programmes for reducing harm from alcohol, tobacco and other drug use among young people aged from 12 to 25 years, including in community, family and school settings. A second part of the literature review covered New Zealand-specific literature, with a particular focus on New Zealand's Māori and Pacific young people. The literature review is being used by the Ministry of Youth Development, in conjunction with other government agencies, to inform the development of guidelines for the evaluation of drug education, standards for drug education, and proposals for community pilot programmes. This process will need to be monitored in the context of the development of a strategy for reducing smoking initiation to ensure that any recommendations for action are consistent with these guidelines.

Primary health care: In respect of initiation, the potential for greater involvement from primary care providers should be explored. Nurses, midwives and general practitioners could be targeted to increase awareness of the importance of early intervention to guard against initiation. Information on risk and protective factors could be made available and training on how to incorporate into practice work the screening of children and adolescents and the identification of at-risk groups.

Community level interventions associated with initiation: With an association having been made between negative socio-economic variables and the increased risk of smoking initiation, interventions aimed at preventing smoking initiation should particularly be targeted at low decile areas. The potentially protective factors of religious involvement would suggest the need to approach church and other religious groups to disseminate information and to develop a programme that addressed the need of their adolescent congregants. The protection offered in relation to participation in sports, clubs and other community activities similarly warrants approaches being made within the community and voluntary sector to discuss ways to increase participation. Although parental smoking is largely shown to not be an important factor associated with initiation, the possibility that it might impact on some age cohorts, that the promotion of adult cessation is a continuing public health objective and that the promotion of smokefree homes is also a generally desirable objective, means that interventions aimed at reducing adolescent smoking should also encourage cessation for parents who smoke.

4. Transition to regular smoking (stage 4)

With the continued and increasing influence of peer smoking in respect of the transition to regular smoking, the comments made earlier about the need for interventions that address this risk factor remain pertinent to deal with this aspect of adolescent tobacco control. The use of the school setting to provide an environment of participation and achievement remains important, as does the delivery of specific youth tobacco programmes within schools. Similarly, the continuing association between participation within the community as a protective factor requires the community level interventions discussed under initiation. The promotion of protective developmental assets remains a key aspect of any set of interventions. These assets have been identified by research as including use of time in organised groups, good health practices in relation to exercise and nutrition, having future aspirations and being able to make responsible choices. An additional component to take into consideration regarding the transition to regular smoking is the recognition of the impact of stress on adolescents and the need to develop alternative coping mechanisms.

While parental actions and attitudes and family environment have little impact on initiation, they emerge into prominence in association with the transition to regular smoking. Community programmes seeking to prevent this transition need to make links to develop family-based interventions. Parents who smoke should be made aware that quitting is associated with reduced risk of their own children smoking. Parental cessation should be considered a key component of future interventions designed to prevent children from smoking. As parents' attitudes to smoking have been identified as key protective factors associated with the progression to established smoking from experimentation, interventions should help parents communicate strong anti-smoking norms to children and adolescents and maintain strong lines of communication with them. The promotion of smokefree homes is also important. Aside from addressing family considerations that directly relate to smoking, the promotion of positive parenting and healthy family environments is a key consideration within community interventions for youth tobacco use.

Sex associations have been strongly recorded in the development process towards regular smoking. This is especially the case with those adolescents who rapidly progress to regular smoking. It is possible that there may need to be programmes that are quite different for males and females. Based on the analysis of risk factors, for males the thrust of some interventions could possibly be toward providing healthier ways of being rebellious while for females greater emphasis may need to be placed on developing self-esteem and identifying ways for coping with stress.

Similarly, the continuing association between regular adolescent smoking and lower socio-economic status requires interventions targeted at lower decile adolescent populations.

The possibility that some adolescents, and in particular females, rapidly progress to regular smoking poses significant challenges to tobacco control. However, the research on this is somewhat limited at the moment; it would appear to be an important area for further investigation. The identification of children at risk of rapid progression is important as the window of opportunity for prevention with these youth is particularly narrow.

Primary health care also offers a cost-effective intervention to work against the transition from initiation to regular smoking. The frequency of contact and the opportunity for one-on-one advice as part of normal visits provide important opportunities. Again, it is important to develop the ability of the primary health care provider to recognise risk factors and the knowledge of networks for referrals.

PART EIGHT: REFERENCES AND APPENDICIES

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Appendix A: Databases

The following databases were searched:

MEDLINE	The United States National Library of Medicine's bibliographic database, which covers the fields of medicine, nursing, dentistry, veterinary medicine, the health care system, and the preclinical sciences. The database contains bibliographic citations and author abstracts from over 11 million articles collated from more than 4,600 biomedical journals. The database contains international literature from 1960 to the present.
ERIC	The United States National Library of Education's bibliographic database, which contains bibliographic citations and abstracts from over 1 million articles and other texts relating to education. The database contains international literature from 1966 to the present.
EMBASE	A database of biomedical and pharmacological literature, which contains over nine million citations from 4,000 journals. The database contains international literature from 1974 to the present.
PsycINFO	A database of psychological literature developed by the American Psychological Association. It contains almost two million citations from various sources, including more than 1800 journals. The database contains international literature from 1967 to the present, and historical records stretching back to the late 19 th century.
Cochrane Library	The Cochrane Library consists of a group of evidence-based databases in the field of medicine. Included in the library are systematic reviews and evaluations of literature. The reviews are prepared by international collaborative teams, and are updated periodically.
Cochrane Controlled Trials Register	CCTR is a bibliographic database of over 300,000 controlled trials in health care. Cochrane groups and other organisations contribute their specialised registers, which, together with references to clinical trials identified in MEDLINE and EMBASE, form the CCTR database. Quality control standards ensure that only reports of definite randomised controlled trials or controlled clinical trials are included.

Cochrane Database of Systematic Reviews	The Cochrane Database of Systematic Reviews includes the full text of regularly updated systematic reviews of the effects of health care prepared by The Cochrane Collaboration.
DARE	A full text database containing critical assessments of systematic reviews from a variety of medical journals. DARE is produced by reviewers and information staff of the National Health Services' Centre for Reviews and Dissemination (NHS CRD) at the University of York (UK), and consists of structured abstracts of systematic reviews.
Social Science Citations Index	A database of literature covering approximately 1,700 scholarly journals in the social sciences. It also contains selected references from approximately 3,300 other science and technology periodicals. The database contains international literature from 1972 to the present.
Science Citation Index	The Science Citation Index is a database of literature covering approximately 5,900 scholarly journals in a broad range of scientific disciplines. The database contains international literature from 1945 to the present.
Current Contents	A multidisciplinary database containing bibliographic information of over 8,000 international scholarly journals and more than 2,000 books.
Dissertation Abstracts	A multidisciplinary database of university theses and dissertations. The database contains over 1.5 million records from mostly North American and European universities. Abstracts have been included from the 1980s.
INNZ	Index New Zealand, containing abstracts of selected New Zealand serial publications, including newspapers and nearly 300 New Zealand journals about New Zealand and the South Pacific. Comprehensive coverage of titles extends from 1987 to the present.
Te Puna	The New Zealand National Bibliography, listing items held by the National Library that are from or about New Zealand.

Appendix B: Reducing Smoking Initiation Review Committee

The members of the Reducing Smoking Initiation Review Committee are:

Anaru Waa

Dr Judith McCool

Dr Nick Wilson

Heidi Flaxman

Helen Darling

Luisa Falanitule (who was subsequently replaced by Vili Nosa)

Shane Bradbrook

Project Management

Dale Wilson - Cancer Society of New Zealand (left to take up a new position in August 2004)

Iain Potter - HSC

Leigh Sturgiss - Smokefree Coalition

Lisa Docherty - Apārangi Tautoko Auahi Kore (left to take up a new position at the end of 2004)

Tane Cassidy - HSC

Appendix C: Alternative Tobacco Products

Chewing tobacco is usually sold as leaf tobacco (packaged in a pouch) or plug tobacco (in brick form) and both are put between the cheek and gum. Users keep chewing tobacco in their mouths for several hours to get a continuous high. Snuff is powdered tobacco (usually sold in cans) that is put between the lower lip and gum. Just a pinch is needed to release nicotine, which is then swiftly absorbed into the bloodstream.

Bidis are thin unfiltered cigarettes that are wrapped in temburni leaves and tied with a short length of thread. They come in different flavours, including strawberry, chocolate and almond and are used extensively in Southeast Asia and India.

A water pipe or hookah consists of a receptacle for water, which has an opening on the top to which a long wooden stem is fixed, the lower end being below the water level. At the top of this stem, a small bowl is attached for tobacco. The tobacco is drawn through the water and inhaled through a long tube fixed to an outlet on the side of the receptacle.