

# **Regulating the Tobacco Retail Environment in New Zealand**

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# Abstract

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## Background

Tobacco use is a leading risk factor for preventable mortality and causes around 5,000 deaths in New Zealand (NZ) each year. In 2011, the Government committed to making NZ smokefree by 2025, through reducing smoking prevalence and tobacco availability to minimal levels. However, the retail environment for tobacco remains relatively unregulated, with no restrictions on where tobacco can be sold, or requirements for tobacco retailers to be licensed. This thesis examines the potential for regulating the tobacco retail environment to reduce smoking prevalence and achieve NZ's 2025 goal.

## Methods

This research comprises five distinct projects. The first is a narrative literature review on tobacco retailing and smoking, and potential policy options to regulate the tobacco retail environment. The second project is a systematic review and meta-analysis examining the association between point-of-sale tobacco marketing and smoking. The third and fourth projects involve qualitative research with tobacco control sector key informants and tobacco retailers, in which stakeholders' views of the tobacco retail environment and regulatory options are examined. The final project is a survey with a complex design to investigate smokers' perceptions of the relative effectiveness of five policy options to reduce tobacco availability.

## Results

The available evidence suggests that greater access to tobacco retail outlets and exposure to tobacco retail products at the point-of-sale are significant risk factors for youth smoking initiation, and for relapse after a quit attempt among adults. Key informants within the tobacco control sector believe that licensing of tobacco retailers is an important intermediate step in achieving the 2025 goal, and envisage tobacco being available only at a small number of specialised outlets in the long-term. Retailers' perceptions of potential tobacco retail policies were mixed; some were supportive of measures to reduce tobacco availability and the 2025 goal, though several expressed ambivalence towards licensing policies. Retailers tended to be more

supportive of tobacco retail policies where the rationale was to protect children from tobacco-related harm, and where this intention was explicit. Among NZ smokers, of the five policy options to reduce tobacco availability that were tested, two were perceived as most effective: i) tobacco only sold at half the existing liquor stores, and ii) tobacco only sold at pharmacies. Each of these policies was rated more likely to prevent youth smoking initiation, and at least as likely to help smokers to quit, relative to a benchmark policy of continued tobacco taxation.

### **Conclusions**

In order for the Government to achieve its own goal of reducing tobacco availability to minimal levels by 2025, regulation of the tobacco retail environment is needed. The recent implementation of legislation banning point-of-sale tobacco displays demonstrates that policy interventions in this environment are feasible. The tobacco control sector strongly supports licensing of tobacco retailers and measures to reduce tobacco availability. Retailers are unlikely to strongly oppose these policies, particularly if the public health rationale is clear. Based on smokers' perceptions, policies that substantially reduce tobacco availability and remove it from smokers' usual places of purchase could be at least as effective as tax increases, in terms of reducing smoking initiation and supporting cessation.

## Preface

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### Role of the candidate

The work for this thesis was carried out from 2013 to 2016. My supervisors were Professor Rob McGee and Dr Louise Marsh from the Department of Preventive and Social Medicine, and Professor Janet Hoek from the Department of Marketing, all based at the University of Otago. Dr Claire Cameron provided statistical supervision and was a collaborator on the meta-analysis in Chapter 3. Dr Richard Egan was my qualitative research advisor. As the PhD candidate, my role in this research involved:

- Writing proposals to secure external funding for a PhD scholarship and for project costs;
- Obtaining approval for the study components from the relevant ethics committees. The qualitative components were approved by the University of Otago's Human Ethics Committee (ref 13/147), and the survey in Chapter 6 was approved by the Department of Preventive and Social Medicine's (Category B) Ethics Committee;
- Conducting literature reviews;
- Developing data collection methods, interview guides, and sampling protocols;
- Completing data collection and analysis (with some co-analysis by supervisors and/ or advisors where specified);
- Drafting, submitting and revising manuscripts for peer-reviewed journals (Table i);
- Obtaining funding to attend conferences to present findings from this research, and developing conference presentations (Table ii);
- Writing the thesis.

My supervisors played a considerable role in conceptualising the studies in this thesis and provided guidance throughout the project. The contributions and support of other individuals is acknowledged on page 7.

## Academic papers

This doctoral thesis is based on a hybrid format, whereby published material has been inserted as chapters, or sections within a chapter. A series of six academic papers has been prepared, five of which have been published. A modified version of one of the papers was also disseminated via scientific blog sites. Table i) outlines these outputs, and provides details of the authors, the contribution of the candidate, the journals, and status at the time of printing of this thesis.

**Table i) Chapters, paper titles, authorship, candidate contribution, and publication status for the journal articles produced for this thesis.**

Ch	Paper title	Authors	Contribution of candidate	Journal
2 (p. 47 - 51)	Regulating tobacco retail in NZ: what can we learn from overseas?	<b>Robertson, L.,</b> Marsh, L., Edwards, R. Hoek, J., van deer Deen, F., & McGee, R.	L Robertson led all aspects of this work.	<i>New Zealand Medical Journal</i> , 2016; 129 (1432): 74-79
2	(Un)licensed to kill: do we need to regulate how tobacco is sold?	<b>Robertson, L.,</b> Hoek, J., Edwards, R. & Marsh, L.	L Robertson was invited to write the article, and led all aspects of this work.	Published online 21 April 2016 on University of Otago Public Health Expert blog and Sci Blogs (sciblogs.co.nz)
3	A systematic review on the impact of point-of-sale tobacco promotion on smoking.	<b>Robertson, L.,</b> McGee, R., Marsh, L. & Hoek, J.	L Robertson led all aspects of this work.	<i>Nicotine &amp; Tobacco Research</i> , 2014; 17 (1): 2-17*
3	Point-of-sale tobacco promotion and youth smoking: a meta-analysis.	<b>Robertson, L.,</b> Cameron, C., McGee, R., Marsh, L., Hoek, J.	L Robertson led all aspects of this work. Professor Peter Herbison provided technical guidance.	<i>Tobacco Control</i> , 2016; 10.1136/tobaccocontrol-2015-052586
4	NZ tobacco control experts' views towards policies to reduce tobacco availability.	<b>Robertson, L.,</b> Marsh, L., Hoek, J. & McGee, R.	L Robertson led all aspects of this work.	Manuscript submitted to <i>New Zealand Medical Journal</i> .
5	Regulating the sale of tobacco in New Zealand: A qualitative analysis of retailers' views and implications for advocacy.	<b>Robertson, L.,</b> Marsh, L., Hoek, J., McGee, R., & Egan, R.	L Robertson led all aspects of this work.	<i>International Journal of Drug Policy</i> , 2015; 26 (12): 1222-1230
6	Smokers' perceptions of the relative effectiveness of five tobacco retail reduction policies.	<b>Robertson, L.,</b> Gendall, P., Hoek, J., Cameron, C., Marsh, L. & McGee, R.	L Robertson led all aspects of this work.	<i>Nicotine and Tobacco Research</i> , 2016; doi: 10.1093/ntr/ntw193

\*Article was awarded 'Editor's Choice' in this edition of *Nicotine and Tobacco Research*

The content within each published paper is largely the same as that found in the chapters of this thesis. Permission has been granted by journal publishers to include these papers in this thesis.

### Conference outputs

In addition to academic papers, several presentations of this research have been made at scientific conferences, as detailed in Table ii).

Table ii) Conference presentations.

Ch	Presentation title	Authors	Conference
3	Point-of-sale tobacco promotion and youth smoking: a meta-analysis.	<b>Robertson, L.,</b> Cameron, C., McGee, R., Marsh, L., Hoek, J.	Poster presentation for <i>Society for Research on Nicotine and Tobacco 21<sup>st</sup> Meeting</i> , Chicago 2-5 March 2016.
5	New Zealand tobacco retailers' attitudes towards tobacco retail policies.	<b>Robertson, L.,</b> Marsh, L., Hoek, J., McGee, R., & Egan, R.	Panel presentation for <i>World Cancer Congress</i> , Melbourne, 4 December 2014.
	Regulating the sale of tobacco in New Zealand: A qualitative analysis of retailers' views.	<b>Robertson, L.,</b> Marsh, L., Hoek, J., McGee, R., & Egan, R.	Verbal presentation for <i>Inaugural Dunedin School of Medicine Symposium</i> , Dunedin, 28 August 2015.
6	Smokers' perceptions of the relative effectiveness of five tobacco retail reduction policies.	<b>Robertson, L.,</b> Gendall, P., Hoek, J., Cameron, C., Marsh, L. & McGee, R.	Poster presentation for <i>Society for Research on Nicotine and Tobacco 21<sup>st</sup> Meeting</i> , Chicago 2-5 March 2016.

### Referencing style

This thesis has been prepared using the American Psychological Association (Sixth Edition) style of references and citations (American Psychological Association, 2016).

## Acknowledgements

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First and foremost, I would like to thank my supervisors, Professor Rob McGee, Dr Louise Marsh and Professor Janet Hoek for the fantastic support throughout my PhD. Your expertise, innovative ideas, kindness and generosity with time have made this process fulfilling and enjoyable. Each of you has taught me a huge amount, for which I am very grateful.

Thank you also to my Advisors: Dr Claire Cameron was an excellent statistical advisor and collaborator, and Dr Richard Egan provided great guidance on qualitative research methods. Professor Peter Herbison provided a large amount of guidance with the meta-analysis, and Professor Sheila Williams helped resolve a complicated study design for the survey in Chapter 6; thank you both for your assistance. I am also grateful to Emeritus Professor Phil Gendall for his generous assistance with conceptualising the study design for the survey in Chapter 6. Professor Richard Edwards, Professor Nick Wilson and Frederieke van der Deen have also contributed to the work in this thesis, by providing feedback on ideas or drafts along the way.

I would also like to thank the co-Directors of the *Cancer Society Social and Behavioural Research Unit (SBRU)* Dr Rose Richards and Associate Professor Tony Reeder for creating such a positive work environment. An additional special thanks to Dr Richards for ongoing wisdom and support. Thanks also to the other members of the SBRU and to other friends and colleagues in the Department for their help and support.

A sincere thank you to NZ Lottery Health for providing me with a PhD scholarship, and to the NZ Asthma Foundation for project funding. Without these funding sources, this project would not have been possible. I would also like to acknowledge all of the individuals who kindly took the time to participate in one of my projects.

Lastly, a big thanks to my family: mum, dad, Colin, Irene and Sile for the huge support and for providing fun distractions from my thesis on my trips back to the UK.

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## Definitions, explanations and abbreviations

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### ***Aotearoa***

Indigenous word, meaning 'New Zealand'

### ***AOR***

Adjusted odds ratio.

### ***Convenience store***

Small outlet selling a limited range of everyday items such as groceries, snack foods, soft drinks, toiletries, newspapers and magazines and tobacco. Commonly referred to as a "dairy" in New Zealand.

### ***Dairy***

See 'Convenience store'.

### ***Density***

As used throughout this thesis, density of tobacco retailers refers to the number of tobacco retailers in a given area.

### ***DHB - District Health Board***

The 20 DHBs in New Zealand are responsible for providing and/ or funding the provision of health services in their district.

### ***Māori***

The indigenous population of New Zealand, which represents around 15.5% of the resident population (approximately 700,000 individuals).

### ***Minors***

Young people who are below the age at which they can legally purchase tobacco (i.e. under 18 years old in New Zealand).

### ***NGO***

Non-Governmental Organisation.

***NSFWG – National Smokefree Working Group***

Provides national strategic leadership on tobacco control initiatives; facilitates communication and information sharing with the sector.

***NZDep2013***

Index of socioeconomic deprivation; an ordinal scale ranging from 1 to 10, where 1 represents the census meshblock (geographic area) with the least deprived scores and 10 the meshblock with the most deprived scores.

***NZ Smokefree Coalition***

A coalition of over 50 organisations that work collectively on tobacco control advocacy, research and communication.

***OR***

Odds ratio.

***R18 store***

Outlet where children under the age of 18 are not permitted; products sold typically include psychoactive substances (e.g. legal recreational drugs), smoking and vaping paraphernalia.

***SEO***

Smokefree Enforcement Officer (see page 24 for explanation).

***SES***

Socioeconomic status.

***SFEAA***

Smokefree Environment (Controls and Enforcement) Amendment Act 2011 (see page 24 for details).

***Year 10***

Year 10 is an educational year group in New Zealand schools. In New Zealand, Year 10 is the tenth full year of compulsory education; students are typically aged 14 to 15 years old.

# **Chapter 1. Tobacco use and tobacco control in New Zealand and conceptual framework of thesis**

## Tobacco Use in New Zealand

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### **Burden of ill-health associated with tobacco use**

Tobacco is the second largest contributing factor to the burden of disease, both globally and in the Australasian region (Lim et al., 2012). In New Zealand (NZ) Tobacco smoking is the single most preventable cause of premature mortality, accounting for approximately 4,500 to 5,000 deaths each year (Ministry of Health, 2012). It is the main cause of lung cancer and chronic obstructive pulmonary disorder in NZ, and around 2,300 New Zealanders die each year from these particular conditions as a result of smoking (Ministry of Health, 2010). Tobacco smoking is also a prominent risk factor for ischaemic heart disease, stroke and various other cancers (including those of the mouth, oesophagus, pharynx and larynx) amongst other conditions. Exposure to second-hand smoke is associated with low birth weight and risk of sudden death amongst infants (World Health Organisation, 2012b) and increased odds of respiratory infections amongst older children (Öberg, Jaakkola, Woodward, Peruga, & Prüss-Ustün, 2011). The direct healthcare costs generated by smoking-related illness in NZ are estimated at \$1.9 billion annually (Glover et al. 2010). Combined with the indirect costs, such as reduced productivity, workplace absence and psychological distress, the costs of tobacco use amount to a substantially higher figure than the \$1.3 billion tax revenue from tobacco (Māori Affairs Committee, 2010).

### **Prevalence of tobacco use**

The New Zealand Health Survey (NZHS), an annual survey by the Ministry of Health, conducts face-to-face interviews with over 13,000 adults and the parents or caregivers of over 4,000 children in order to provide key health data that is generalisable to the NZ population. According to the most recent NZHS, which uses data collected from July 2014 to June 2015, the prevalence of current smoking<sup>1</sup> amongst people aged 15 years and over is 17% while that of daily smoking is 15% (Ministry of Health, 2015a). Overall, males are around 1.2 times more likely than females to be current or daily smokers, though Māori females have higher smoking rates than Māori males (Table 1).

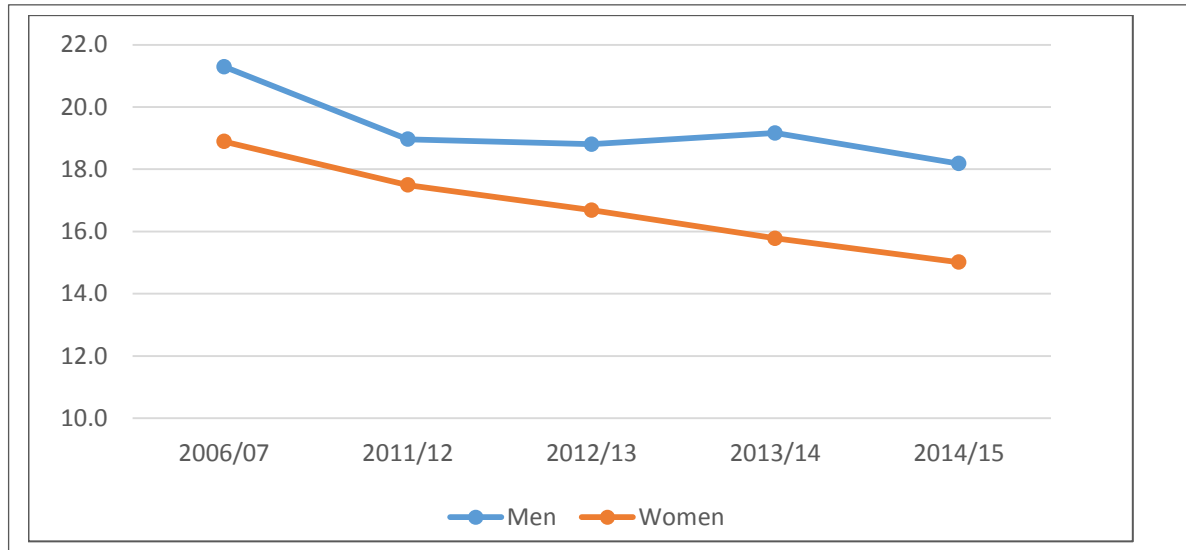
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<sup>1</sup> Current smoking was defined as adults who smoke at least monthly and who have smoked at least 100 cigarettes in their lifetime



Comparisons with earlier data show steady declines in the prevalence of current tobacco smoking in the adult population over time (Figure 1).

Figure 1. Prevalence of smoking in NZ 2006 to 2015, by sex



Data source: (Ministry of Health, 2015a). Data are owned by the New Zealand Ministry of Health and licensed for reuse under a Creative Commons Attribution 4.0 International Licence.

Data on occasional smoking or social smoking are very limited. One recent study reported that 14% of New Zealand university students smoked occasionally (compared to just 3% who reported daily smoking), and that hazardous alcohol drinking was positively associated with occasional smoking (Marsh et al., 2016).

### Tobacco use by ethnicity and socioeconomic status

Despite an apparent decline in overall smoking prevalence in NZ since 1996/7, rates of smoking remain high amongst certain population groups. Māori have the highest prevalence of current smoking at around 38%, and have 2.7 times the odds of being a current smoker compared to non-Māori (Ministry of Health, 2015a) (Table 1). The smoking prevalence of Pacific people is also markedly higher than that of Asian, European and other ethnicities, and Pacific people have 1.4 times the odds of being a current smoker, compared to non-Pacific people (Ministry of Health, 2015a).

Table 1. Current smoking by ethnic group, unadjusted prevalence

Ethnic group	Prevalence, %		
	Total	Male	Female
Māori	38.1	34.0	41.8
Pacific	24.7	26.5	23.1
Asian	6.4	10.7	2.1
European/ other	15.1	17.2	13.1

Data source: (Ministry of Health, 2015a). Data are owned by the New Zealand Ministry of Health and licensed for reuse under a Creative Commons Attribution 4.0 International Licence.

The data for daily smoking follow the same pattern as that for current smoking, with the highest rates observed amongst Māori (36%), followed by Pacific Island people (22%), compared to 15% for the European/ other ethnic group and 6% for the Asian ethnic group.

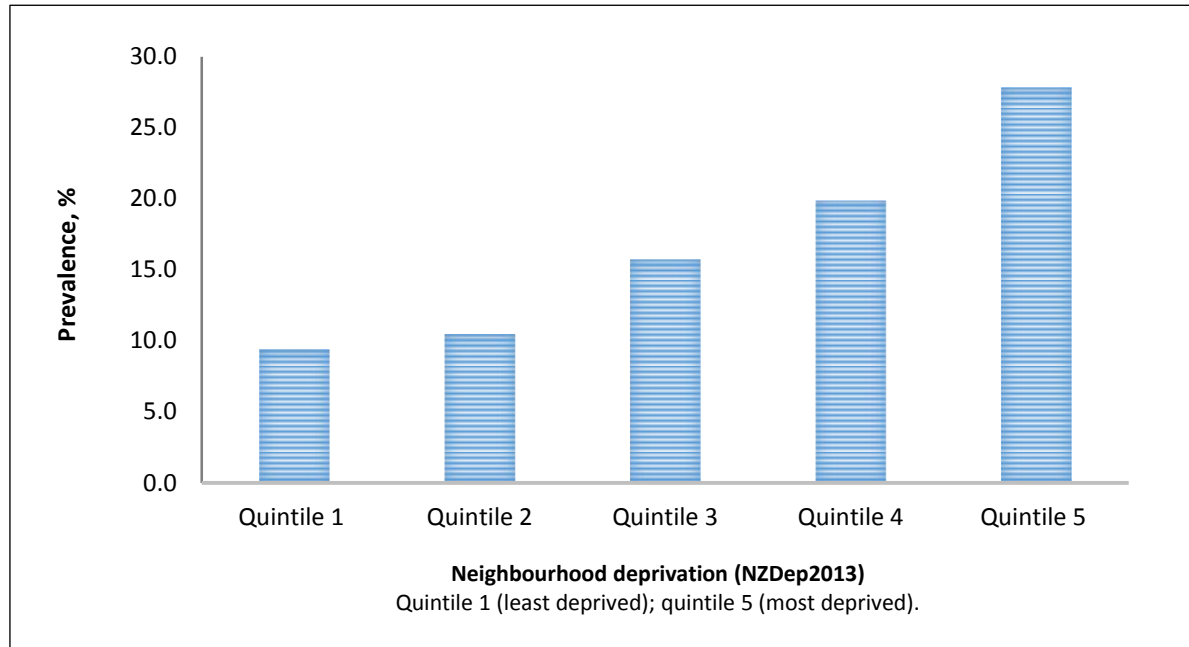
Disparities in smoking also exist according to socioeconomic status (SES). As shown in Figure 2, in neighbourhoods categorised as quintile 1 and quintile 2 (the two least deprived quintiles) the smoking prevalence is 9% and 11%, respectively. By contrast, the rate of current smoking in the two most deprived neighbourhoods is on average 28%. Adults living in the most socioeconomically deprived areas are 3.1 times as likely to be current smokers compared with adults living in the least deprived areas (Ministry of Health, 2015a). Since Māori and Pacific people tend to be over-represented in areas of socioeconomic deprivation (Ministry of Health, 2015c), the higher smoking prevalence among these groups is likely to be, at least in part, due to the relative socioeconomic disadvantage of these groups.

As a consequence of higher smoking rates in certain ethnic and socioeconomic groups, the morbidity and mortality attributable to smoking is also higher among these populations. Smoking accounts for between 11% and 21% of the disparity in mortality between low and high socioeconomic groups, and between 5% and 8% of the gap in mortality between Māori and NZ European ethnicities<sup>2</sup> (Wilson, Blakely, & Tobias, 2006). While these estimates may appear modest, the absolute number of smoking-

<sup>2</sup> Including “other” ethnicities but excluding Pacific people

attributable deaths is sizeable, at approximately 5,000 each year, and these deaths are entirely preventable.

Figure 2. Current smoking, by neighbourhood deprivation



Data source: (Ministry of Health, 2015a). Data are owned by the New Zealand Ministry of Health and licensed for reuse under a Creative Commons Attribution 4.0 International Licence.

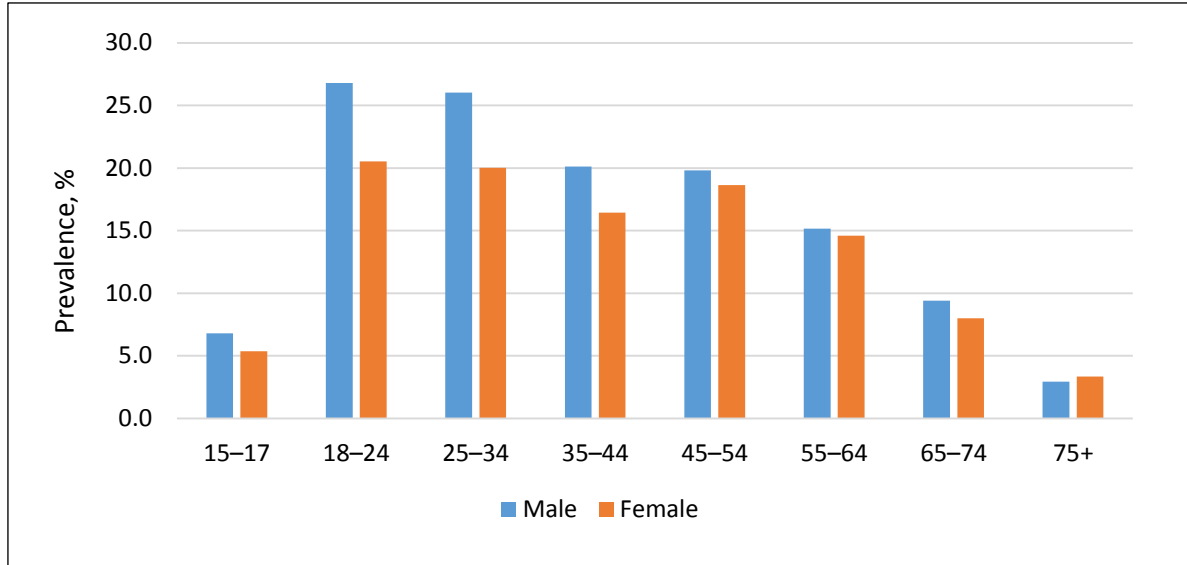
### Tobacco use by age

Smoking prevalence in NZ varies by age and, currently, the groups with the highest rates of smoking are 18 to 24 year olds (24%), followed by 25 to 34 year olds (23%; Figure 3). This pattern is seen for both sexes. Data collected annually by Action on Smoking and Health New Zealand (ASH) show that the rates of daily and regular smoking<sup>3</sup> amongst Year 10 students (typically aged 14 to 15 years old) have steadily declined since 2000, from 15% and 28%, respectively (ASH, 2014). In 2014, among Year 10 students the rate of regular smoking was 6% and daily smoking was just 3%. Similarly, the prevalence of never-smoking among Year 10 students has increased from 33% in 2000 to 77% in 2014 (Figure 4). There are differences in youth smoking status by ethnicity, with a similar pattern to that seen in the general population. While there have been significant and steady decreases in smoking prevalence for all ethnic groups

<sup>3</sup> Regular smoking is defined as smoking at least monthly (i.e. includes weekly and daily smokers)

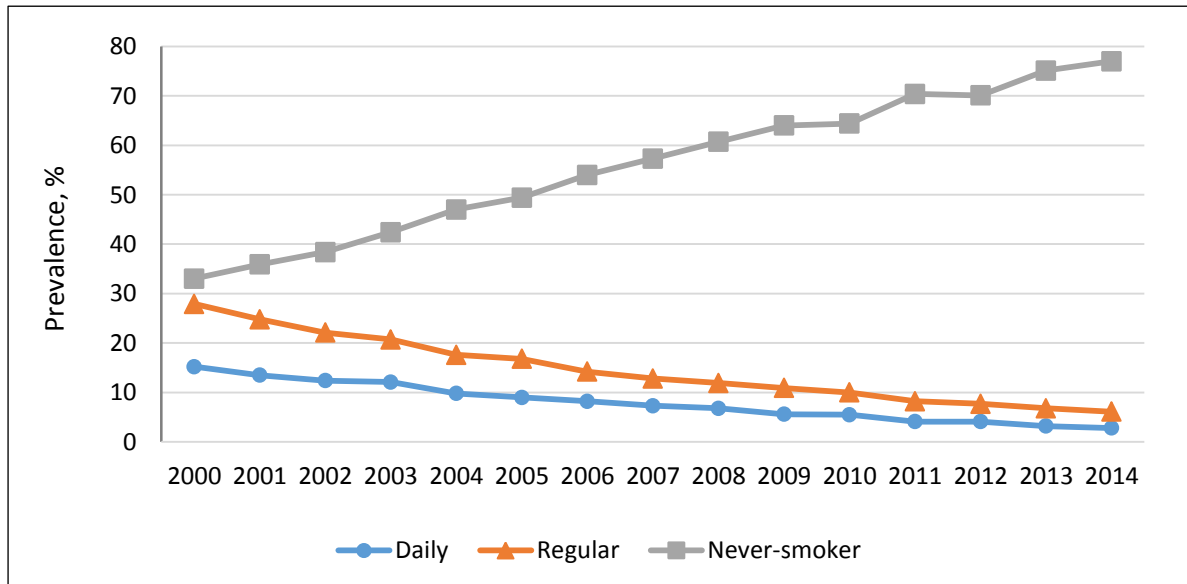
in NZ, Māori youth are three times more likely to be a regular smoker compared to NZ European or Asian students (ASH, 2014).

Figure 3. Current smoking, by age group and sex



Data source: (Ministry of Health, 2015a). Data are owned by the New Zealand Ministry of Health and licensed for reuse under a Creative Commons Attribution 4.0 International Licence.

Figure 4. Smoking status for Year 10 students, 2000 to 2014



Data source: ASH NZ. 2014 Factsheet 1: ASH Year 10 Snapshot Survey: Topline results.

In contrast to the decline in smoking rates over time for most age groups, the smoking prevalence for adults over 45 years has remained almost unchanged since 2006/07 (Ministry of Health, 2015a). About 19% of adults aged 45–54 years are current smokers, which is not significantly different to the 2011/12 rate of 17%. The current smoking rate for those aged 55–64 years has remained at 15% since the 2011/12 NZHS (Ministry of Health, 2015a).

While the evidence suggests that overall smoking prevalence has been declining over the past two decades, and is continuing to do so, the data also reveal several concerns. First, smoking continues to cause a high number of preventable deaths each year. Second, the high smoking rates amongst Māori, Pacific and socioeconomically disadvantaged groups indicate serious and persistent health inequalities. Lastly, economic modelling studies suggest that if the Government continues with tobacco control measures on a 'business as usual' basis, achieving the 2025 smokefree goal among all population groups is highly unlikely (Ikeda, Cobiac, Wilson, Carter, & Blakely, 2015; van der Deen, Ikeda, Cobiac, Wilson, & Blakely, 2014).

## Tobacco Control in New Zealand

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Two agendas guide and inform tobacco control efforts in NZ: the Framework Convention for Tobacco Control, and the Government's goal of becoming a smokefree nation by 2025.

### The Framework Convention for Tobacco Control

New Zealand, alongside 179 other countries, is a Party to the Framework Convention on Tobacco Control (FCTC), the first global public health treaty negotiated under the auspices of the WHO (World Health Organisation, 2015). The FCTC aims to reduce the supply and demand of tobacco products (World Health Organisation, 2009) and proposes a set of minimal tobacco control measures that Parties are required to implement and report on. These measures include demand reduction provisions, such as price and tax measures, legislation to protect against exposure to second-hand smoke, regulation of tobacco product contents, packaging and labelling provisions, and restrictions on tobacco advertising and promotion. The supply-side provisions include measures to support economically viable alternative activities for tobacco farmers, and to control illicit trade in tobacco products and sales to minors (Table 2).

Table 2. FCTC articles relating to reducing demand and supply of tobacco, as categorised by the World Health Organisation (World Health Organisation, 2015)

Measures relating to the reduction of demand for tobacco
6 - Price and tax measures to reduce the demand for tobacco
7 - Non-price measures to reduce the demand for tobacco
8 - Protection from exposure to tobacco smoke
9 - Regulation of the contents of tobacco products
10 - Regulation of tobacco product disclosures
11 - Packaging and labelling of tobacco products
12 - Education, communication, training and public awareness
13 - Tobacco advertising, promotion and sponsorship
14 - Demand reduction measures concerning tobacco dependence and cessation
Measures relating to the reduction of the supply of tobacco
15 - Illicit trade in tobacco products
16 - Sales to and by minors
17 - Provision of support for economically viable alternative activities

The FCTC was adopted by the World Health Assembly in 2003 and NZ became a signatory in June that year. New Zealand ratified the Convention in January 2004, at which point the measures and protocols outlined in the treaty became legally binding, and the FCTC came into force in February 2005. The FCTC has far-reaching implications for tobacco control, since over 100 countries have now banned some form of tobacco marketing (World Health Organisation, 2011).

### **New Zealand's 2025 smokefree goal**

Arguably, the most significant progress in tobacco control in NZ since the FCTC occurred in 2010 when the Māori Affairs Select Committee (MASC) conducted an inquiry into the tobacco industry and the consequences of tobacco use for Māori (Māori Affairs Select Committee, 2010). This inquiry aimed to provide Parliament with an understanding of the adverse effects of tobacco on Māori and on NZ as a whole. The inquiry called for public submissions concerning the historical actions of the tobacco industry, the impact of tobacco use on the wellbeing of Māori in NZ, and possible tobacco control measures to mitigate the negative impact of tobacco. In response, 260 submissions and 1,715 letters were received from the public, health professionals, academics and the industry (Māori Affairs Select Committee, 2010). Following this public consultation process, the MASC's final report recommended the goal of becoming a smokefree nation by 2025, and outlined a broad range of interventions to achieve that goal. Some of those interventions represented new measures for NZ (e.g. the removal of point-of-sale tobacco displays in retail outlets) while others had not been implemented anywhere in the world (e.g. interventions to reduce tobacco supply from international manufacturers) (Blakely, Thomson, Wilson, Edwards, & Gifford, 2010).

In 2011, in response to this inquiry, the NZ government announced a goal to make the nation smokefree by 2025 (referred to hereafter as the '2025 goal') (New Zealand Government, 2011). In this context, the definition of smokefree is widely accepted as a reduction in smoking prevalence to 5% or less across all population groups, and reducing tobacco availability to minimal levels (New Zealand Smokefree Coalition, 2011). Whilst New Zealand's 2025 goal was the first of its kind globally, other

developed countries have also begun to work towards a smokefree vision. Finland's Tobacco Act of 2010 stipulated an aim to end the use of tobacco products, and although the tobacco control community has adopted a vision of a smokefree Finland by 2040 (Levy, Blackman, Currie, Levy, & Clancy, 2012), this is not a Government policy. In 2013, Scotland announced a target of becoming smokefree by 2034 (Christie, 2013), and Australia has a goal of reducing the smoking prevalence to 10% or less by 2020 (Gartner, Barendregt, & Hall, 2009). In 2016, the Swedish Government endorsed a target of a smokefree Sweden by 2025 (Tobaksfakta, 2016).

Researchers have recently drawn attention to the relative lack of progress by the Government in relation to achieving the recommendations laid out by the MASC (Ball et al., 2016a). Specifically, they argue that 34 of the 43 recommendations have not been adequately progressed – examples include the extension of smokefree environments, including smokefree cars carrying children, and targeted mass media campaigns. Further, they note concerns that the MASC recommendation to reduce the supply and availability of tobacco has been described by the Ministry of Health as a 'low priority' (Ministry of Health, 2015b).

### **Current tobacco retail legislation in NZ**

The Smoke-free Environment (Controls and Enforcement) Amendment Act 2011 (SFEAA), the most recent smokefree legislation in NZ, mandated new tobacco control measures in the retail environment. Enacted in July 2012, the SFEAA introduced several changes, including: prohibiting the visible display of tobacco products (i.e. a POS display ban); increasing the penalty for sales of tobacco to people under 18; prohibiting the display of trading names that contain words, phrases, trademarks, or company names that have the effect of advertising. Smokefree Enforcement Officers (SEOs) are NZ Government employees with responsibility for monitoring compliance with the SFEAA and investigating potential breaches. SEOs have legislative powers enabling them to enter and inspect retail premises; take photographs or videos; inspect advertising or display material; seek identifying information from any person when sale to a minor has occurred, and carry out prosecution proceedings. In NZ, as in many other developed countries, no licence or registration is required before a retailer may



sell tobacco, and furthermore, no register or accurate database of tobacco retailers exists to support the enforcement of smokefree legislation (Marsh, Doscher, & Robertson, 2013). Smokefree Enforcement Officers use ad-hoc and arguably inefficient methods of maintaining a record of tobacco outlets, such as searching online directories (e.g. Yellow Pages) (Marsh et al., 2013). Any type of outlet is permitted to retail tobacco in NZ, and tobacco products are also available at many non-retail premises, such as alcohol-licensed premises, sporting and social clubs. Health researchers have argued that allowing tobacco to be retailed so widely is inconsistent with public health messages about the dangers of using tobacco and the NZ government's goal of a smokefree nation (Whyte, Gendall, & Hoek, 2014).

Many public health advocates believe stronger restrictions on the retailing of tobacco are necessary, both in NZ and internationally (Ackerman, Etow, Bartel, & Ribisl, 2016; Chapman & Freeman, 2009; Edwards et al., 2012; Gartner & McNeill, 2010; Paul et al., 2010; Tilson et al., 2013; Whyte et al., 2014). The widespread retail availability of tobacco is an important form of tobacco promotion, particularly for countries such as NZ that restrict other forms of tobacco marketing (Freeman, Gartner, Hall, & Chapman, 2010; Henriksen, 2012; Paul et al., 2010). However, the FCTC does not explicitly acknowledge tobacco retailing (aside from POS displays and promotions) as a form of marketing. By contrast, internal tobacco industry documents illustrate the importance of the tobacco retail environment to the industry (Carter, 2003). For example, Philip Morris Australia (PML) wrote the following shortly before the Australian government introduced restrictions on tobacco sponsorship in 1996;

*"...as of 1996, the primary point of communication between ourselves and our consumers will be inside a retail outlet... in-store POS [point of sale] material, discounted stock units, on-pack premium offers, strategically located stock displays in-store (as well as in windows and showcases), need to be dominated by PML. In summary, the spend focus has shifted from media, outdoor and consumer promotions to in-store, contracting for display space, [and] partnerships with retailers to build business....." PML, cited in Carter (2003).*

Although point of sale tobacco displays and promotions are no longer permitted in NZ, evidence such as this from industry documents indicates the significant energy and resources expended by the tobacco industry to build and maintain relationships with tobacco retailers (Carter, 2003).

### Proposed actions to achieve the 2025 goal

In NZ, the National Smokefree Coalition comprises over 50 organisations that work collectively on tobacco control advocacy, research and communication. A sub-group of the Coalition, the National Smokefree Working Group (NSFWG), provides national strategic leadership on tobacco control initiatives and facilitates communication and information-sharing with the sector. Since the launch of the 2025 goal, the NSFWG has proposed a comprehensive programme of actions to guide tobacco control efforts in NZ, referred to in the *'Smokefree Aotearoa 2025 Action Plan 2015-2018'* and the *'NSFWG Road Map to Smokefree Aotearoa by 2025'* (National Smokefree Working Group, 2015a). These actions are shown in Table 3.

Table 3. NZ's tobacco control priorities, as identified in the Smokefree Aotearoa 2025 Action Plan

Increasing effective cessation
1. Deliver comprehensive cessation services tailored to community needs
2. Increase tobacco control mass media
3. Utilise the best cessation technologies
4. Develop a policy response to Electronic Nicotine Delivery Systems
Effective legislation and regulation
5. Implement standardised tobacco packaging
6. Increase the price of tobacco products through increased taxation
7. Restrict tobacco supply
8. Control tobacco product content
9. Ensure full implementation of the FCTC
Increasing public support
10. Continue expansion of smokefree environments
11. Ensure New Zealanders know about and support initiatives required to achieve Smokefree 2025
12. Raise public awareness about the tobacco industry's conduct so it mistrusts its information and strategies
13. Raise public awareness of tobacco addiction so people who smoke are not stigmatized.

Under priority 7, 'Restrict tobacco supply', the Action Plan identifies a need for a comprehensive policy to reduce tobacco availability, and calls for varied policy options to be identified and prioritised. The NSFVG advocates that all stakeholders, including the government, health services, communities and academics, play a role in working towards the proposed outcomes. Research into measures that would reduce tobacco supply in NZ (both with regards to retail supply and imports into NZ) has been identified as an urgent priority to support the 2025 goal (Blakely et al., 2010).

## Conceptual Framework of Thesis

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### **The new public health**

Public health aims to improve health and prolong and promote quality of life among populations. The way in which public health is conceptualised is heavily influenced by political and scientific ideology (Baggott, 2000). This research is based on a broad view of public health, often termed the 'new public health', which recognises that health is embedded in the home, workplace, school, community and broader environments in which we live (Milio, 1987; World Health Organisation, 1998). This approach advocates the creation of supportive environments for health, and emphasises social responsibility for health, as opposed to purely personal responsibility (World Health Organisation, 1998; Minkler, 1999).

### **Health promotion and building healthy public policy**

Within the field of public health, health promotion aims to change economic, physical and social environments, and thus alleviate their impact on health. It also aims to strengthen the skills and capacity of individuals and communities, enabling them to improve their own health (World Health Organisation, 1998). The Ottawa Charter, the fundamental framework for health promotion, proposes key areas for health promotion action ranging from downstream strategies, such as skill development, to upstream interventions, including advocacy for 'healthy public policy' (World Health Organisation, 1986).

Healthy public policy was a term originally coined by public health advocate Trevor Hancock in the early 1980s to distinguish between policy concerned with the provision of health care services, and policy made in other sectors that impacts on health (Hancock, 1985). Public policies, defined as the "action, or inaction... pursued by governments in relation to some issue or problem" (Brooks, 1989) ultimately shape all aspects of our society, environment, and hence our behaviour (Milio, 1988; O'Neill & Pederson, 1992). Proponents of health promotion argue that it is governments' responsibility to foster physical, social, cultural, economic and political environments

that are conducive to health (Milio, 1987). Various policy tools to promote health and prevent illness are available to governments, as described by Milio;

*“Public policy has become the most adequate and pervasive collective instrument for shaping the environments and lifestyles of populations. This it does by favouring (through incentives, direct provision and education) or discouraging (by regulation, disinvestment, or taxation) the options for choices by producers and consumers, by individuals as well as public and private organizations” (p.60) (Milio, 1988).*

Many public health advocates consider building healthy public policy to be a more effective health promotion strategy than individual health education approaches, resulting in better outcomes, reducing inequalities in health, and avoiding any potential stigmatisation associated with targeting ‘at-risk’ populations (McKinlay, 1993; Signal, 1998).

#### **The role of research in building healthy public policy**

Research evidence plays a potentially important role in shaping public policy (Davis & Howden-Chapman, 1996; Petticrew, Whitehead, Macintyre, Graham, & Egan, 2004; Sabatier & Weible, 2007) and enabling advocacy for healthy public policy (McKinlay, 1993; Milio, 1987; O'Neill & Pederson, 1992). Research aimed at supporting healthy public policies should collect information regarding the different policy options that will promote healthy choices. This information should also examine how interested parties perceive policy options (Milio, 1987; O'Neill & Pederson, 1992). Proponents of healthy public policy advocate a mixed-methods approach: a qualitative methodology to enable an in-depth understanding of an issue from the perspective of different stakeholders, supplemented by quantitative data to improve the generalisability and inferential strength of findings (McKinlay, 1993; Milio, 1987; O'Neill & Pederson, 1992).

## Aim of thesis

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The aim of this thesis is to examine how potential policy measures could regulate the NZ tobacco retail environment, and the effect these measures could have on reducing smoking prevalence and achieving the 2025 goal. The specific research questions are outlined below.

### *Chapter 2: The nature of the problem: the tobacco retail environment and smoking*

- What aspects of the tobacco retail environment function as marketing, and what is the evidence of their effect on smoking? What are the policy options for regulating the tobacco retail environment in NZ?

### *Chapter 3: POS tobacco promotion and smoking: a systematic review and meta-analysis*

- What evidence is there that POS display bans (the most recently implemented policy affecting NZ's tobacco retail environment) reduce smoking?

### *Chapter 4: Qualitative work with NZ tobacco control experts*

- How important do tobacco control experts consider tobacco retail policies to be in achieving the 2025 goal? Which tobacco retail policies do they consider most likely to be effective in achieving the 2025 goal? What effect do experts believe those policies would have? What are the barriers and facilitators to implementing these policies?

### *Chapter 5: Qualitative work with NZ tobacco retailers*

- How do tobacco retailers perceive licensing and other policies that could reduce the availability of tobacco products, or change the tobacco retail environment? What factors and values underlie retailers' views towards regulation?

### *Chapter 6: Randomised experimental survey*

- How do smokers perceive the likely effects of different tobacco retail policy options on their own and others' smoking behaviours?

### *Chapter 7: Conclusions*

- A summary of the new knowledge created, the implications and conclusions.

## **Chapter 2. The nature of the problem: the tobacco retail environment and smoking**

## Tobacco Retail Availability in NZ

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### **The influence of tobacco marketing**

The marketing of tobacco products has a major effect on tobacco use, and data from several international studies demonstrate a causal relationship between tobacco advertising and promotion, and increased tobacco use (National Cancer Institute, 2008). Specifically, tobacco marketing promotes experimentation with smoking, increases tobacco consumption amongst established users, discourages quit attempts, and encourages relapse (Henriksen, 2012; National Cancer Institute, 2008). Comprehensive marketing strategies tend to be based on the “four Ps” of: Promotion, Price, Product and Place. These strategies include direct advertising in mass media and other promotional activities (e.g. sponsorship, merchandising, free samples and POS promotions); pricing at retail and wholesale levels; attributes of the product that make it more appealing (e.g. flavours); and distribution channels that make products easily accessible to the public (primarily through retailers) (Henriksen, 2012; National Cancer Institute, 2008).

As summarised in Chapter 1, NZ has prohibited the display and promotion of tobacco products in the retail environment. Yet tobacco is retailed widely, which in itself is a major form of tobacco promotion (Henriksen, 2012) and inconsistent with the Government’s 2025 goal to reduce tobacco supply to minimal levels. There are no restrictions on the type of outlet permitted to sell tobacco in NZ; no licence is required to be able to sell tobacco, and there is no accurate database of where tobacco is sold (Marsh et al., 2013). This chapter summarises the current tobacco retail landscape in NZ, and analyses the relationship between tobacco retail availability and smoking. The chapter ends with a review of the policy options to regulate the tobacco retail environment in NZ.

### **The tobacco retail landscape in NZ**

Since there are no official data on NZ tobacco retailers, a 2013 study provides the only available evidence regarding the number and types of outlets that sell tobacco (Marsh et al., 2013). This study collated data on known tobacco retail outlets from SEOs



throughout the country and used Geographic Information Systems software to map these outlets in relation to secondary schools and neighbourhood socioeconomic status. Overall, the study identified 5,008 outlets, with the majority (approximately 80%) of outlets being categorised as either a convenience store, service station, an on-licensed premises (i.e. where alcohol is available to consume on the premises, such as a bar or restaurant) or a supermarket (Table 4). The remaining 20% of tobacco retail outlets comprised a very wide range of businesses, including caravan parks, motels, department stores, manufacturing and automobile repair businesses, takeaway food shops, community recreational facilities and bookshops (Table 4).

Table 4. Tobacco retail outlets in NZ

Outlet type*	N	%
Convenience store	2023	40.4
Service station	911	18.2
On-licensed premises	646	12.9
Supermarket	471	9.4
Café	345	6.9
Liquor store	213	4.3
Other retail/ service/ manufacturing	153	3.1
Bookshop	70	1.4
Accommodation	53	1.1
Tobacconist	51	1.0
Community	36	0.7
Duty free	19	0.4
Unknown	17	0.3
Total	5008	100

Data source: (Marsh et al., 2013). Table reproduced according to authors' copyrights.

\*Inclusions and definitions: convenience store (dairy, corner store, mini mart, and small supermarket), on-licensed premises (bar, nightclub, hotel, restaurant, Returned Services' Association and sports clubs), café (any food place, eat in or takeaway, which does not sell alcohol), other retail/service/manufacturing (businesses that do not traditionally sell tobacco, e.g. architects, party goods retailer, trade/construction businesses), bookshop (includes post shops, lotto shops, and gift shops), accommodation (motor camps, motels, rest homes), tobacconist (tobacconist and hairdressers; most fall under both), community (includes art gallery, city council, swimming pool, prisons and consulates), and unknown (unknown what these businesses are).

The estimate of 5,008 retail outlets provided by Marsh et al. (2013) is known to be an underestimation of the true figure; an industry source cites British American Tobacco NZ as having 7,894 retail customers (Euromonitor, 2014). Despite this underestimate, the study highlights that tobacco retailers are widespread throughout NZ, with a

density of at least one tobacco retail outlet per 617 adults and one outlet per 129 adult smokers (Marsh et al., 2013). The data also indicate that certain population groups have greater access to tobacco retailers than others. Firstly, the density of tobacco outlets tended to be greater in areas of higher socioeconomic deprivation: approximately 30% of the outlets were located in neighbourhoods in the lowest socioeconomic quintile, compared to the highest socioeconomic quintile (in which approximately 7.5% of the outlets were located). Secondly, the study indicated that school children in NZ have easy access to tobacco retail outlets: 46% of secondary schools had at least one tobacco retailer within a 500m walk, and 76% had an outlet within a 1000m walk. On average, there were 1.4 tobacco retailers within a 500m radius, and 5.7 tobacco retailers within a 1000m radius of secondary schools.

#### **How do NZ smokers obtain tobacco?**

Data from 2000 to 2008 suggest that most NZ minors who are current smokers obtain tobacco from social sources such as friends and family members, yet around one-third (34%) report that they also purchase tobacco from shops, with 3% doing so exclusively (Marsh, Gray, McGee, Newcombe, & Patterson, 2012). Only around one-quarter (28%) of minors report being asked to show proof of age or report a retailer refused to sell them tobacco (Marsh et al., 2012). These findings are supported by recent data from the NZ 2014 Youth Insights Survey (YIS), in which 29% of current smokers aged 14 to 15 years old reported they could buy tobacco from a shop if they wanted to (Health Promotion Agency, 2015b).

The aforementioned data reports the frequency of ever having obtained tobacco from various sources. By contrast, other studies have examined minors' *usual* source of tobacco supply. Using this measure, a small proportion (approximately 10%) report *usually* buying their tobacco from shops (Gendall, Hoek, Marsh, Edwards, & Healey, 2014). This proportion has remained relatively unchanged since 2007 (Gendall et al., 2014), though YIS data suggest this figure may have increased slightly, since in 2014 17% of current smokers aged 14 to 15 years old said they usually bought their cigarettes from a shop (Health Promotion Agency, 2015a).

There is good evidence that effective enforcement of laws that prohibit tobacco sales to minors can reduce youth smoking (DiFranza, 2012; Stead & Lancaster, 2000). However, enforcement of minimum purchase age legislation may be ineffective unless carried out consistently and uniformly, since retailers may be less willing to comply if they perceive their competitors will not, and young people may switch to an alternative retailer (Stead & Lancaster, 2000). Although social supply is the principal method by which young people obtain tobacco, preventing tobacco retail sales to minors is an essential component of any tobacco control strategy, and a legal requirement for all Parties to the FCTC (World Health Organisation, 2015)

There are no data available on the tobacco purchasing patterns of adult smokers in NZ. This is likely due to the fact that since most smokers start smoking before the age of 18 (U.S. Department of Health and Human Services, 2014), existing research has typically focused on youth access to tobacco to help prevent smoking initiation. However, research does suggest that the retail setting is a more important source of supply for regular smokers (as opposed to intermittent smokers who tend to obtain tobacco from others) and as smokers become older (Gendall et al., 2014; Harrison, Fulkerson, & Park, 2000).

## Access to tobacco outlets and youth smoking

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In addition to research examining the tobacco retail landscape and youth access trends, several studies have investigated whether characteristics of the tobacco retail environment (i.e. density and proximity of tobacco retailers) are associated with smoking outcomes.

### **Tobacco retailers around schools and risk of smoking**

Several international studies have investigated the relationship between density of tobacco retail outlets around schools and smoking. Three studies conducted in the U.S. each found that a higher number of tobacco outlets around a high school was positively associated with experimental smoking, but found no relationship with current smoking (Adams, Jason, Pokorny, & Hunt, 2013; McCarthy et al., 2009; Pokorny, Smith, & Pokorny, 2003). One Californian study found a higher rate of past 30-day smoking amongst students at schools surrounded by the highest level of tobacco outlet density, though there was no association with the number of cigarettes smoked (Henriksen et al., 2008). However, another Californian study found no association between tobacco outlet density around schools and past 30-day smoking frequency (Lipperman-Kreda et al., 2014). Results of studies outside of the U.S. also appear varied. For example, two studies from Canada found no association between tobacco retailer density in a school neighbourhood and school smoking prevalence (Chan & Leatherdale, 2011; Leatherdale & Strath, 2007), yet one reported a positive association for ease of purchasing tobacco (Leatherdale & Strath, 2007), and the other reported increased odds of smoking susceptibility<sup>4</sup> amongst never-smokers (Chan & Leatherdale, 2011). An Australian study found that tobacco outlet density was not associated with any smoking in the past 30 days, but was associated with the number of cigarettes smoked in past week (Scully et al., 2013). Somewhat surprisingly, a recent Scottish study reported that attending a school in an area of highest tobacco retail density was negatively associated both with ever-smoking and current smoking (Shortt, Tisch, Pearce, Richardson, & Mitchell, 2016). The authors of this study attributed the findings

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<sup>4</sup> Smoking susceptibility is an indicator of a never-smoker's predisposition to smoking, based on intentions and expectations of future behaviour, and has been found to be a valid predictor of future smoking amongst adolescents (Pierce, Choi, Gilpin, Farkas, & Merritt, 1996).

to intensive enforcement of legislation preventing sales to minors amongst retailers located near to schools.

Only one study in NZ has investigated whether the density of tobacco retail outlets around secondary schools is associated with smoking behaviours amongst the school's students (Marsh et al., 2015). Smoking data for this study came from the 2012 national ASH survey of Year 10 students, in which 298 schools and 27,238 students participated. After controlling for a range of individual-level and school-level variables, a high tobacco retailer density within 1000m of a school was positively associated with susceptibility to future smoking among never-smokers, and with attempted tobacco purchase among current smokers. There were no significant associations with experimental smoking or successful tobacco purchase and, similar to the aforementioned Scottish study by Shortt et al. (2016), higher tobacco retailer density around the school was negatively associated with current smoking. Consistent with the Scottish study, the authors concluded that greater enforcement around schools could account for the unexpected negative association, and that greater availability of tobacco around a school has the largest impact on young people who are not already established smokers. The findings also likely reflect the importance of social supply (i.e. obtaining tobacco from friends) for children who are already smoking.

In addition to tobacco retailer *density*, three of these studies assessed whether school *proximity* to a tobacco outlet was associated with increased risk of smoking. Measures of outlet proximity were not found to be associated with school smoking prevalence (Henriksen et al., 2008), established or experimental smoking (McCarthy et al., 2009), number of cigarettes smoked (Henriksen et al., 2008; McCarthy et al., 2009), or frequency of past-30 day smoking (Lipperman-Kreda et al., 2014). However, a recent study in Washington, DC reported that the closer a tobacco retail outlet was to a high school, the higher the likelihood of an illegal tobacco sale to a minor, though this was the case only for neighbourhoods with high proportions of ethnic minority residents (Kirchner et al., 2014).

### **Tobacco retailers around the home and risk of smoking**

Evidence linking tobacco retailer density in residential neighbourhoods to smoking appears to be more consistent than the evidence for outlet density and school neighbourhoods. In the U.S., a study of over 2,000 people aged between 11 and 23 years old found that those living in a neighbourhood with a higher retail outlet density were significantly more likely to have smoked during the past 30 days, compared to those living in areas with lower tobacco outlet density (Novak, Reardon, Raudenbush, & Buka, 2006). This association was true both for minors and people over the legal purchase age of tobacco, indicating that children and older adolescents are equally susceptible to the effects of living in a neighbourhood with high tobacco retail density. Johns et al. (2013) used data from the 2011 New York City Youth Risk Behavior Survey of 11,570 students, mostly aged 14 to 18 years old. The odds of smoking initiation over a 12-month period were significantly higher among students who reported being exposed to tobacco retail outlets twice or more each week, compared to those exposed once a week or not at all. Studies in California have found that adolescents residing in an area with higher tobacco outlet density have greater odds of ever-smoking, of having smoked tobacco in the previous 12 months (Lipperman-Kreda, Grube, & Friend, 2012), and a higher frequency of smoking (Lipperman-Kreda et al., 2014). A study of 12 to 17 year olds in New York found that living in an area of higher tobacco retail density was associated with greater odds of believing that smoking makes young people look cool, but there were no associations for current smoking or the number of cigarettes smoked per day (Loomis et al., 2012). In Scotland, adolescents living in the areas of the greatest residential retailer density had 53% higher odds of ever-smoking and 47% higher odds of current smoking, compared to those living in areas without any tobacco retailers (Shortt et al., 2016).

In terms of residential proximity to tobacco outlets, the research findings are scarce. One study conducted with 205 Latino adolescents (mean age 16 years old) in San Diego suggested that the odds of having tried smoking increase as adolescents' proximity to tobacco retailers increases (West et al., 2010). The only other available evidence, from a Californian study, did not find an association between distance to the nearest tobacco

outlet from home and frequency of past-30 day smoking (Lipperman-Kreda et al., 2014).

### **Summary of evidence linking tobacco retailer access and youth smoking**

Studies that have examined retailer access and youth smoking are relatively limited, and findings vary according to the outcome measure and study setting. However, the studies do tend to be consistent in two regards. Firstly, greater density of tobacco retailers around schools tended to be positively associated with experimental smoking, ever-smoking and future smoking susceptibility, as opposed to current (i.e. regular) smoking. This evidence suggests that the impact of greater tobacco retailer density around a school appears greatest on adolescents who are not yet addicted, but willing to smoke opportunistically. Secondly, proximity of schools to a tobacco retailer does not appear to influence students to experiment with smoking, rather, it is important if there are several retailers within walking distance. The evidence linking tobacco retail density around the home and smoking is more consistent, and suggests that living in an area with higher numbers of tobacco outlets increases the odds of both experimental smoking and current smoking. Most of this research has been conducted in the U.S. and, while there are no NZ studies of this nature, the only study to have been conducted outside of the U.S. - in Scotland - produced results consistent with the U.S. research (Shortt et al., 2016). Shortt et al. (2016) argue that reducing tobacco outlet density in a community overall would be more effective in preventing youth smoking initiation, compared to reducing density solely around schools.

Some limitations to the evidence base should be noted. All of the studies above used a cross-sectional design (including those that assessed 12-month smoking). As a result, conclusions cannot be drawn as to the causal direction of the relationship. Whilst increased tobacco availability may lead to more tobacco use, it is also plausible that higher rates of tobacco smoking in an area result in more stores selling tobacco to meet the demand. The observed associations may be confounded by a factor not accounted for, for example, smoking at home. Three of the six studies that reported a positive association between tobacco outlet density around the home and youth smoking did not control for home/ parental smoking (Novak et al., 2006; Lipperman-Kreda et al.,

2012; Lipperman-Kreda et al., 2014), yet the remaining three studies did (Loomis et al., 2012; Shortt et al., 2016; Johns et al., 2013), which provides us with some confidence that parental/ caregiver smoking does not fully account for the associations observed. Ascertaining consistency across studies is difficult due to the range of different outcome measures used. Further, the extent of POS tobacco promotion varied across the study settings. In the U.S., where most research has been conducted, POS tobacco promotion was much more extensive than in other settings (i.e. Scotland, Australia and NZ). These methodological and contextual differences make it difficult to disentangle the extent to which the associations were due to tobacco retailer density, or exposure to POS tobacco marketing, or both.



## Access to tobacco outlets and adult smoking

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### Tobacco retailers around the home and smoking prevalence

In addition to studies that focus on children and young people, research also suggests a positive association between tobacco outlet density and smoking amongst adults. However, this body of research reports complex relationships, likely moderated by neighbourhood socioeconomic status (SES). Chuang et al. (Chuang, Cubbin, Ahn, & Winkleby, 2005) examined data from five cross-sectional studies conducted between 1979 and 1990 with a sample of more than 8,000 people aged 25 to 74 years old living across 82 different neighbourhoods in California. They used density of convenience stores as a proxy measure for tobacco availability and found that a high density of convenience stores in the residential neighbourhood was positively associated with current smoking, after controlling for individual-level SES. However, once neighbourhood-level SES was also controlled for, convenience store density only increased odds of smoking for people with high SES. They concluded that the protective effect of high SES on smoking may be diminished by living in an area of high tobacco outlet density.

Other U.S. studies have produced consistent results and reported higher smoking rates in areas with higher tobacco outlet density, but also found that the relationships were explained – at least in part - by demographic factors of the population, such as neighbourhood deprivation and a larger proportion of ethnic minority residents (Peterson, Lowe, & Reid, 2005; Reid, Peterson, Lowe, & Hughey, 2005). In New South Wales, Australia, neighbourhood tobacco outlet density has been found to be positively associated with smoking status among adults, even after controlling for neighbourhood SES and several demographic variables (Marashi-Pour et al., 2015). This study also found a significant relationship between neighbourhood disadvantage and tobacco outlet density, and concluded that greater local access to tobacco products promotes the uptake and maintenance of smoking, over and above the independent effect of socioeconomic disadvantage.

The only NZ study of this kind found that individuals living in neighbourhoods with the greatest access to tobacco outlets had higher odds of smoking compared to those living in neighbourhoods with the lowest access (Pearce, Hiscock, Moon, & Barnett, 2009). Similar to Chuang et al. (2005), they found that once neighbourhood-level SES and rurality were controlled for, this association no longer held. However, there are limitations to this research that may also have contributed to the non-significant result. Firstly, the study only accounted for tobacco purchasing around the home, and not near workplaces and in other locations. Secondly, the measure of access to supermarkets and convenience stores was based on travel times by car, yet this in itself is likely to be associated with neighbourhood socioeconomic factors. Thirdly, only a limited range of outlets were included in the study, and these do not represent the full range of stores from which tobacco can be purchased in NZ (Marsh et al., 2013). Lastly, there was little variation in the exposure measure, which could have led to an underestimation of the true effect size (Rose, 2001).

#### **Tobacco retailers around the home and smoking cessation**

As opposed to the studies described above that used smoking prevalence measures, the majority of research in this area has investigated whether greater exposure to outlets may undermine adult smokers' quit attempts. The first of these studies was conducted in Houston with 414 adult smokers who were motivated to quit (Reitzel et al., 2011). In this study, the density of tobacco retailers around the home was not associated with 6-month abstinence, but participants living less than 500m to a tobacco retail outlet were less likely to be abstinent from smoking, compared to those who lived farther from the closest tobacco outlet. The strength of this relationship increased with decreased distance (i.e. <250m) to the closest outlet, suggesting that the closer a person lives to an outlet, the lower the odds they will remain abstinent after a quit attempt. This study was replicated in the UK, using data on 611 adult smokers and similar measures and methods, though did not find any statistically significant associations (Han, Alexander, Niggebrugge, Hollands, & Marteau, 2014). Differences in the level of retail tobacco promotion between the U.S. and the UK could explain the different results.

Kirchner et al. collected smoking data from 475 smokers who had made a quit attempt; they used ecological momentary assessment (EMA), a methodology that enables real-time data to be collected using cellphones (Kirchner et al., 2013). In this study, the geographic location of participants was mapped continuously for one month following the quit attempt, and exposure to tobacco outlets was recorded based on an existing geographic dataset of tobacco retailers. Participants were significantly more likely to lapse (i.e. smoke) on days where they came within 30m proximity of a tobacco outlet, and lapsing was increasingly likely as the number of daily contacts with a tobacco store increased. A study by Burton et al. in Australia (a jurisdiction with a POS display ban) used a combination of in-depth interviews and a qualitative EMA approach with smokers and attempting quitters (Burton, Hoek, Nesbit, & Khan, 2015). In this study, participants reported that the presence of tobacco-related cues, such as seeing a tobacco retail outlet, was sufficient to stimulate thoughts of smoking and prompt tobacco purchases, thus undermining quit attempts.

Other research suggests that demographic factors may moderate the relationship between access to tobacco outlets and smoking abstinence. For example, in a large study from Finland, the likelihood of smoking cessation over a follow-up period of 5.5 years was 27% lower for smokers living less than 500m from the nearest tobacco store, but only for males who were moderate to heavy smokers (Halonen et al., 2013). In the U.S., a 3-year longitudinal study of 2,377 smokers found that living in an area of high tobacco outlet density and living within 500m of a tobacco outlet were both associated with reduced odds of smoking abstinence, but only in high poverty areas (Cantrell et al., 2015). In Scotland, people living in areas with the highest tobacco outlet density had a 5% lower chance of being an ex-smoker compared to those in areas with lowest tobacco outlet densities, yet there was no evidence that the tobacco retail environment disproportionately affected low income communities (Pearce, Rind, Shortt, Tisch, & Mitchell, 2016).

As yet, there is no NZ research on the association between tobacco retail outlets and smoking cessation outcomes.

### **Summary of evidence linking tobacco retailer access and adult smoking**

The available evidence suggests a positive association between tobacco retailer outlet density and adult smoking prevalence, although the relationship may be confounded by other neighbourhood-level variables that are associated with higher smoking rates, such as SES. Evidence suggests that tobacco outlet density is higher in areas of lower SES and where there is a larger proportion of ethnic minority residents (Marsh et al., 2013; Novak et al., 2006; Shortt et al., 2015). Further, since the majority of studies are cross-sectional it is plausible that a higher smoking prevalence in an area could result in more tobacco retail outlets.

In terms of the effect on smoking cessation, adults who live in a neighbourhood with a greater availability of tobacco outlets, especially those who live in close proximity to a tobacco store, are less likely to remain abstinent after a quit attempt. While research in this areas is scarce, the use of longitudinal research (Cantrell et al., 2015; Halonen et al., 2013; Reitzel et al., 2011) and the EMA methodology (Kirchner et al., 2013) provides greater confidence that tobacco retail access has a causal effect on relapse than evidence from cross-sectional studies alone would offer. Since the extent of POS tobacco promotion varied across the study settings, it difficult to ascertain the extent to which the associations might be due to tobacco retailer access, or exposure to POS tobacco marketing, or both.

## Access to alcohol outlets and alcohol use

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Since the literature on tobacco retail access and smoking is relatively scarce, comparisons with the extensive evidence on alcohol outlets provides insights as to the reliability of the conclusions drawn in the previous sections. In 2009, Campbell et al. reviewed the available evidence in this area, which consisted of i) time-series analyses (where the association between changes in alcohol outlet density and alcohol-related outcomes is assessed over time); ii) studies assessing the impact of privatising alcohol sales, and iii) cross-sectional studies of the association between alcohol outlet density and alcohol-related outcomes (Campbell et al., 2009). The review concluded that there was strong evidence of a positive association between alcohol outlet density and alcohol consumption and alcohol-related harm, and that increases in alcohol outlet density over time were accompanied by increases in alcohol consumption. While few studies investigated reduced alcohol outlet density, the review suggested that - for communities where it was unfeasible to travel to areas where alcohol was available - alcohol consumption and harm was reduced. Based on the findings of this influential paper, the U.S. Task Force on Community Preventive Services recommended limiting alcohol outlet density through licensing and zoning, as a means of reducing excessive alcohol consumption and harm (Monshouwer, Verdurmen, Ketelaars, & van Laar, 2014). Similarly, the World Health Organisation subsequently recommended restricting alcohol outlet density as a strategy to reduce alcohol consumption and related harm (World Health Organisation, 2012a). The main caveat in comparing the evidence for tobacco access with that of alcohol, is that the harms associated with alcohol consumption extend to others in society to a greater extent than is the case for tobacco. Therefore, comparisons cannot be drawn with tobacco for those studies that investigated alcohol-related outcomes such as violence, injuries, and motor vehicle accidents. Despite this caveat, the evidence showing an association between alcohol outlet density and alcohol consumption creates a logical analogy that supports evidence of a relationship between tobacco outlet density and proximity to smoking.

## Mechanisms

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Several mechanisms could account for the relationship between the density and proximity of tobacco outlets and smoking. The first is underpinned by 'availability theory', where availability refers to the accessibility or convenience of purchasing a product such as tobacco (Bowden, Dono, John, & Miller, 2014; Livingston, Chikritzhs, & Room, 2007; Wilkins & Sweetsur, 2008). If the product is widely available, its 'full cost' - the time and effort required to obtain the product in addition to the purchase price - reduces, which in turn may encourage greater consumption (Babor et al., 2010; Chaloupka, 1999; Chaloupka, Grossman, & Saffer, 2002).

Secondly, social cognitive theories such as the Theory of Planned Behaviour (Ajzen, 1991), suggest that widespread availability of a substance such as tobacco contributes to a higher prevalence by increasing the perceived acceptability, or social norms relating to the substance. Where tobacco is perceived as easy to obtain and readily available, people may develop beliefs that smoking is more prevalent than it actually is, which may in turn influence their smoking experimentation and progression (Adams et al., 2013). Researchers have also argued that allowing tobacco sales to occur alongside other everyday products such as bread, milk and newspapers further contributes to a perception that tobacco use is an everyday product (Tilson, 2011).

Thirdly, a higher density of retail outlets in an area may lead to a more competitive market, which could increase the likelihood that tobacco retailers breach legislation, such as through sales to minors (Monshouwer et al., 2014), selling single cigarettes (Auckland Regional Public Health Service, 2015, 2016) or possibly lowering their tobacco prices (McCarthy, Scully, & Wakefield, 2011). Exacerbating this problem further is the fact that a larger number of tobacco outlets in an area necessitates a greater capacity for monitoring and enforcing tobacco retail legislation. An inability to carry out enforcement activities consistently and uniformly undermines the effectiveness of minimum purchase age legislation (Stead & Lancaster, 2000).

Fourth, in jurisdictions without POS display bans, a greater density of tobacco outlets may increase exposure to tobacco branding and advertising, which several studies

suggest is a risk factor for smoking (Paynter & Edwards, 2009; Robertson, Cameron, McGee, Marsh, & Hoek, 2016; Robertson, McGee, Marsh, & Hoek, 2014); the mechanisms underpinning this particular association are discussed further in Chapter 3. In jurisdictions that have a ban on tobacco displays at the POS, even the presence of an outlet selling tobacco can create smoking cues and trigger cravings amongst smokers (Burton et al., 2012; Burton et al., 2015).

Lastly, as mentioned in a Chapter 1, evidence suggests vulnerable population groups are exposed to tobacco retail outlets to a greater extent. Both in NZ and internationally, lower socioeconomic groups have been found to have greater access to retailers selling tobacco (Lee, Henriksen, Rose, Moreland-Russell, & Ribisl, 2015; Marsh et al., 2013; Pearce et al., 2009; Schneider & Gruber, 2012; Yu, Peterson, Sheffer, Reid, & Schnieder, 2010). Easier access may contribute to the higher prevalence of smoking amongst low socioeconomic groups and ethnic minorities, including Māori and Pacific populations in NZ.

## Policy options to regulate the tobacco retail environment

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### How is access to other harmful products regulated in NZ?

In NZ, the Sale and Supply of Alcohol Act 2012 (New Zealand Government, 2012) requires all vendors to have a licence to sell alcohol. Certain types of outlet – namely, petrol stations, garages, dairies and convenience stores - are not permitted to have a licence. Only products less than 15% alcohol volume (e.g. beer, wine and mead) are permitted to be sold in supermarkets and grocery stores, and legislation stipulates maximum trading hours (i.e. 7am to 11pm), and prohibits sales on Anzac Day morning, Good Friday, Easter Sunday & Christmas Day at off-licenced premises. Children under 18 years of age are not permitted to enter a liquor store unless accompanied by an adult. The licensing process for alcohol enables the general public, local council authorities, Police and Medical Officers of Health, to be made aware of new applications. These stakeholders are given the opportunity to make submissions on alcohol licensing applications and thus can influence who obtains a licence.

Psychoactive substances encompass a range of new or previously obscure chemical compounds, marketed as 'legal highs' or substitutes for existing illegal drugs such as synthetic cannabis (Winstock & Barratt, 2013b). The Psychoactive Substances Act, which came into effect in NZ in July 2013, aimed to minimise the harm associated with the use of these new untested psychoactive substances and an unregulated market (Wilkins et al., 2013). The Act required retailers to have a licence to sell approved products, stipulated a minimum vendor age of 18 years of age, and prohibited sales of psychoactive substances in dairies, convenience stores, petrol stations, or any store where alcohol is sold. Local councils were given the power to determine who was granted a licence, and thus where products could be sold. This legislation reduced the number of shops selling these products from over 3,000 to just 156 specialty outlets (Wilkins, 2014; Wilson, Edwards, Hoek, Thomson, & Jaine, 2016) though sales were subsequently stopped completely after a further amendment to the law in May 2014.

These comparisons illustrate that the retail environment for tobacco in NZ is much less regulated than that for alcohol, and for psychoactive substances. By contrast, the



mortality associated with tobacco use in NZ far outweighs that associated with either alcohol (Connor, Kydd, Rehm, & Shield, 2013) or psychoactive substances (Winstock & Barratt, 2013a).

### **Tobacco retail policies implemented overseas**

Comparisons can also be made with tobacco retail regulation in other jurisdictions, as these represent precedents on which NZ policies could be based.

#### ***Negative licensing schemes***

Negative licensing schemes require retailers to notify government authorities that they are selling tobacco. Retailers neither have to seek permission nor prove their suitability, to sell tobacco, but they may be removed from the register and have the right to sell tobacco revoked on a temporary or permanent basis. For example in New South Wales (NSW, Australia) all retailers of tobacco are legally required to be registered with the Government Licensing Service (Fry et al., 2016). In Scotland and Ireland, mandatory tobacco retailer registration schemes make it illegal to sell tobacco without registration, and authorities can ban or suspend retailers from selling tobacco if they breach legislation (Office of Tobacco Control, 2015; Scottish Government, 2011). In Fiji (World Health Organisation, 2013), New York (NY) State (Center for Public Health and Tobacco Policy, 2013), and several Canadian jurisdictions including Ontario (Ontario Ministry of Finance, 2015), Nova Scotia (Nova Scotia Provincial Tax Commission, 2015), Quebec (Revenu Quebec, 2013), and British Columbia (Ministry of Finance, 2015), tobacco retailers are required to register annually or apply for a permit, and these schemes may entail annual fees. In NY State, violations of smokefree legislation can result in suspensions or revocation of retailers' ability to sell not only tobacco, but also alcohol and lottery tickets (Center for Public Health and Tobacco Policy, 2013).

#### ***Positive licensing schemes***

A positive licensing scheme, such as those implemented in five of Australia's eight states and territories (Smyth, Freeman, & Maag, 2015), requires retailers to apply for a

tobacco retail licence. This licence is only granted if conditions are met and a fee is paid. In Australia, annual fees range from \$200 to \$510 AUD, though conditions on obtaining a licence are minimal (Smyth et al., 2015). Singapore (Health Sciences Authority, 2015) and Finland (Ministry of Social Affairs and Health, 2010) both have positive tobacco retail licensing with an annual fee set by local authorities, and the Finnish licensing system requires retailers to submit satisfactory operational plans and reports in order to successfully renew the licence each year (Ministry of Social Affairs and Health, 2010). Within NY State, local licensing systems operate in conjunction with state-level registration. In NY City, retailers apply biannually for a licence to sell cigarettes, paying a \$110 USD fee. Similarly, in Dutchess County (NY) a permit is required to sell tobacco. In each of these cases, licences can be revoked for violations of smokefree legislation (Center for Public Health and Tobacco Policy, 2013).

Stronger tobacco licensing schemes have begun to be introduced in some areas. In Santa Clara County (California), for example, tobacco retailers are required to apply for a permit, with no permits granted to any retailer applying to operate within 1000 feet of a primary or secondary school or within 500 feet of another tobacco retailer (Center for Public Health and Tobacco Policy, 2013). Since permits cannot be transferred if a business is sold, this approach supports a gradual reduction in retailer density. In 2011, a law change in Huntington Park, California, prohibited any tobacco retail licences being issued to retailers in residential zones, within 500 feet of “youth-populated areas” (i.e. schools, childcare centres, playgrounds, libraries, parks and arcades), or within 200 feet of another tobacco retailer. Furthermore, no more than one licence is granted per 1000 residents (Center for Public Health and Tobacco Policy, 2013).

A particularly innovative approach has been introduced in Hungary, where legislation enacted in 2013 mandated that tobacco could only be sold at a limited number of government-licensed outlets (Caceres & Chaiton, 2013). This measure dramatically reduced the number of tobacco stores from around 42,000 to 7,000. Applicants wishing to sell tobacco were required to submit a business plan and pay a flat fee; successful bids were granted a 20 year concession to sell tobacco. The quota for tobacco licences is linked to the population size: in a municipality with fewer than two

thousand residents the maximum is one; for municipalities with more than two thousand residents, one licence is issued for every two thousand residents (Julia Berki, email to author, 3 August 2015).

In addition to these examples, San Francisco officials have recently approved the Tobacco Sales Reduction Act, a law that imposes a limit of 45 tobacco retailing permits for each of the 11 city districts (Sabatini, 2014). This state law does not affect existing permit holders, which are expected to decline from the current 1000 permits to 495 through attrition, over the next 10 to 15 years. The Cook Islands Government has also recently approved a licensing scheme for tobacco retailers as part of a reform of the national tobacco legislation (Radio New Zealand, 2015).

### *Evidence of effectiveness of tobacco retailer licensing*

Although published evaluations are limited, tobacco retail licensing schemes appear to increase compliance with youth access restrictions and may also reduce the retail availability of tobacco, even if that was not the primary intention. An evaluation of the NSW scheme indicates that registered tobacco outlets are less likely than unregistered outlets to breach smokefree legislation (Fry et al., 2016). Research on the South Australia (SA) (Bowden et al., 2014) and Santa Clara County (Coxe et al., 2014) schemes suggests that introducing an annual licence fee and application process may be sufficient in and of itself to reduce the number of retailers selling tobacco. In SA, when the cost of a tobacco retail licence fee increased from \$12 to around \$200 AUD, the number of tobacco retail licences decreased by 24% over two years, with the largest decline in licences occurring for on-licensed venues (i.e. venues where alcohol is available for consumption on the premises) (Bowden et al., 2014). The licensing scheme in Finland is also believed to have reduced the number of outlets selling tobacco (Halonen et al., 2013), though there are no official data to support this conclusion (Reeta Honkanen, email to author, 8 July 2015). A NZ modelling study suggests that drastically reducing the number of tobacco outlets in NZ could help reduce smoking prevalence over the long-term (Pearson, van der Deen, Wilson, Cobiac, & Blakely, 2015). In this study, the estimated effect on smoking prevalence was modest in size, however, the particular analyses undertaken were based on certain

assumptions that may have resulted in conservative estimates. The impact of retailer licensing schemes on youth uptake and smoking prevalence has yet to be investigated.

### **Policy options not previously implemented**

In addition, or as an alternative to the aforementioned policies, a regulatory model for tobacco in NZ could incorporate measures that have not yet been implemented by any country or jurisdiction. One measure could be to require those selling tobacco to be aged 18 or over, which is technically a legal requirement in NZ since it is mandated by Article 16 of WHO Framework Convention on Tobacco Control (World Health Organisation, 2003). Additionally, tobacco sales could be prohibited at on-licensed premises such as bars and nightclubs. The link between alcohol use and smoking uptake and relapse is well established (Shiffman, Balabanis, Fertig, & Allen, 1995). Therefore not allowing tobacco sales at locations where alcohol is consumed might be an important way to reduce the risks associated with drinking alcohol and smoking at the same time, and reduce smoking initiation and relapse after cessation. Other strategies that would greatly reduce tobacco availability include restricting tobacco sales to specialist outlets where children are not allowed, such as off-licensed liquor stores (Pearson et al., 2015). Pharmacy-only tobacco sales is another option that merits further investigation (van der Deen, Pearson, & Wilson, 2014). In the U.S., tobacco is sold in many pharmacies, and there is concern about the potentially normalising effect of allowing this situation, given the health-promoting role that these facilities have (Brennan & Schroeder, 2014). Yet it has been suggested that only allowing tobacco sales at pharmacies (and nowhere else) would reduce availability of tobacco and could be a way to increase smokers' access to cessation support (Henriksen, 2012; van der Deen et al., 2014). This approach has been considered by the Icelandic Government, although it has not been progressed to date (van der Deen et al., 2014).

## Conclusions

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Tobacco is retailed widely throughout NZ, at up to nearly 8,000 outlets according to industry sources (Euromonitor, 2014). Evidence indicates that greater access to tobacco retail outlets is associated with increased odds of youth smoking initiation, and reduced odds of abstinence after a cessation attempt. Children and young people rely predominantly on social sources of tobacco (Gendall et al., 2014), although the apparent ease with which minors can purchase tobacco in NZ is concerning (Health Promotion Agency, 2015b; Marsh et al., 2012). Evidence suggests if enforcement is conducted consistently, it may reduce youth smoking (DiFranza, 2012; Stead & Lancaster, 2000). One way to potentially enhance enforcement in NZ would to require tobacco retailers to hold a licence. Licensing of tobacco retailers has been introduced in many overseas jurisdictions and while evidence of this measure's impact on smoking rates is not available, evaluations suggest licensing can improve retailers' compliance with legislation (Fry et al., 2016) and may reduce the number of outlets selling tobacco over time (Bowden et al., 2014; Coxe et al., 2014). Fewer outlets could reduce smoking initiation among young people who are susceptible to smoking, and also help quitters to remain abstinent after a cessation attempt (Burton et al., 2015; Cantrell et al., 2015; Kirchner et al., 2013). Different approaches to reducing tobacco outlet density have been implemented internationally, from setting a maximum number of outlets at the national-level, as in Hungary (Caceres & Chaiton, 2013), to long-term attrition of tobacco retailer licences in San Francisco City (Sabatini, 2014) and Huntington Park (Center for Public Health and Tobacco Policy, 2013). Alternatively, or additionally, restrictions on tobacco sales around schools and other youth-populated areas could be adopted (Center for Public Health and Tobacco Policy, 2013). Restrictions could also be introduced by limiting the outlets allowed to sell tobacco, as opposed to solely their location. Examples of this type of approach in the literature include allowing tobacco to be sold only at off-licensed liquor stores (Pearson et al., 2015) or at pharmacies (van der Deen et al., 2014).

One of the mechanisms that likely contributes to the association between exposure to tobacco retailers and smoking is POS display of tobacco products, which functions as a

form of advertising. The next chapter of this thesis examines the evidence linking this particular aspect of the tobacco retail environment to smoking.

## **Chapter 3. Exposure to point-of-sale tobacco promotion and smoking**

## Introduction

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In many countries, restrictions on tobacco advertising in traditional media have led the industry to become more reliant on the retail environment as a marketing medium (Feighery, Ribisl, Schleicher, & Clark, 2004; Pollay, 2007). For example, in the U.S. in 2011, the largest cigarette manufacturers spent 84% of their total expenditure on advertising and promotion in the form of incentives to retailers and wholesalers; a figure of around \$7 billion (Federal Trade Commission, 2013). These incentives encourage retailers to use POS tobacco advertising, signage, and product “slotting” (preferred positions in displays) (Bloom, 2001; Feighery et al., 2004; Lavack & Toth, 2006), and demonstrate the importance of the retail environment to the industry. Industry documents suggest POS marketing aims to increase “category growth” (i.e. tobacco consumption) (Pollay, 2007), and marketing publications have described POS displays as, “the last resort in advertising tobacco products” (Euromonitor International, 2012, p. 8). Young people exposed to tobacco brands at POS tend to have more positive perceptions of people who use those brands (Donovan, Jancey, & Jones, 2002) and higher brand recall (Wakefield, Germain, Durkin, & Henriksen, 2006). As defined by the WHO Framework Convention on Tobacco Control, a ‘comprehensive’ ban on tobacco promotion includes POS activities, since these promotions are essentially forms of advertising (Henriksen, 2012). It is unsurprising that the industry has opposed moves to ban the open display of tobacco products in retail outlets (British American Tobacco, 2012; Philip Morris International, 2012), and mounted legal challenges to this policy (Carter, Mills, & Donovan, 2009; Li et al., 2013).

In 2009, a systematic review identified twelve peer-reviewed articles examining the impact of POS tobacco promotion (Paynter & Edwards, 2009); ten on smoking initiation amongst children and two on adult smokers. The evidence was consistent with a positive association between exposure to POS tobacco promotion and increased smoking; however, areas of weakness in the evidence base were highlighted. The need for more prospective studies was identified, as well as studies examining POS promotion and quitting, and research evaluating the implementation of POS display bans. While most countries continue to allow extensive retail tobacco promotion



(Henriksen, 2012), several jurisdictions have banned POS tobacco displays, and many of these bans took effect since the 2009 review was published (e.g. Ireland, Australia, Norway, NZ, Finland, the UK, Panama and Uruguay). As a larger evidence base documenting the impact of POS tobacco display bans now exists, it is important to update the earlier review to ensure a comprehensive and current research base, and provide a resource for tobacco control researchers and advocates. Furthermore, tobacco industry-commissioned research has heavily criticised the evidence linking POS tobacco displays and smoking (Basham, 2010; Gunter, Undated; Keegan, 2010). Such criticisms may impede the development of retail restrictions on tobacco, thus heightening the importance of updating reviews of the evidence base. This project provides an opportunity to examine and put into perspective these criticisms. Furthermore, before this project, there had been no published meta-analysis of the overall effect size of the association. Identifying the magnitude of the association may help policy-makers quantify the benefits of prohibiting POS tobacco promotion.

The first aim of this project was to update and extend the 2009 systematic review, and examine how recent research affects evidence of an association between POS tobacco promotion and smoking. This work is presented in Part A of this chapter. The second aim of this project was to provide an estimate of the effect size of the association between POS tobacco promotion and smoking amongst children and adolescents. This work, the meta-analysis, is presented in Part B of this chapter. Part B focusses solely on smoking amongst children and adolescents, as the scarcity of research evidence on POS promotion and adult smoking made a meta-analysis of these studies unfeasible. Hence, the inclusion criteria for the systematic review and meta-analysis were different, and these are therefore presented as distinct studies within this chapter.

## Part A – Systematic Review

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### Methods

#### *Literature search strategy*

Relevant literature published since 2008 was identified initially through keyword searches in Medline (OvidSP), Scopus and Web of Science. The search terms were similar to those used by Paynter & Edwards (2009): the keywords “tobacco” or “smoking” or “cigarette\*” were combined with “point-of-sale”, “point of sale”, “POS”, “point-of-purchase”, “point of purchase”, “POP”, “power wall” or “retail”. Subsequent searches combined “quit”, “relapse” or “cessation” and “ban\*”, “remov\*”, “prohibit\*” or “evaluation” with the retail search terms. The titles of retrieved articles were reviewed and references were discarded if they were not related to tobacco control. The titles and abstracts of the remaining references were used to identify whether articles were relevant and met the inclusion criteria below. The full text of articles was obtained where further clarification on the measures and study objective was needed. Further searches were conducted using the reference lists and ‘cited by’ lists of retrieved articles and through ‘related article’ searches on Google Scholar. The 2013 online editions of Tobacco Control and Nicotine & Tobacco Research were scanned for relevant articles. The literature searches were conducted in October 2013 (by the thesis candidate, LR). LR and Primary Supervisor Rob McGee (RM) independently reviewed the articles for eligibility for inclusion.

#### *Inclusion criteria*

Original qualitative or quantitative research studies published in a peer-reviewed journal between 1 January 2008 and 30 October 2013 and written in English were included. Similar to Paynter & Edwards’ (2009) criteria, research was eligible if it included either self-reported or objective measures of exposure to POS tobacco promotion (e.g. awareness of POS promotion, visits to stores where POS promotion was present, assessments of the quantity of POS tobacco promotion within a specified study area); this criterion included both ‘real-world’ exposure to POS tobacco promotion and simulated exposure in experimental research. Exposure data relating to cigarette brand awareness were included only if the measure specifically identified brands in a

retail setting. For all studies, the inclusion criteria for outcome measures were population-level smoking prevalence, individual-level smoking behaviour (experimentation, smoking initiation, regular smoking, quitting behaviour and relapse, and cigarette purchasing behaviour), smoking-related cognitions (e.g. smoking susceptibility, cravings to smoke, perceived likelihood of future smoking, perception of peer-smoking prevalence) and population-level cigarette sales data. For research examining the impact of removing POS tobacco promotion, quantitative studies were eligible if the exposure measure included implementation of legislation restricting POS displays and promotion, and a comparison of pre- and post-legislation outcome measures was reported. Qualitative research was eligible if it examined smoking behaviours or smoking-related cognitions following exposure to, or in relation to the removal of, POS tobacco promotion.

Several potentially relevant articles identified during the literature search process did not meet inclusion criteria, including studies of: access to tobacco retailers and smoking (Adams et al., 2013; Johns et al., 2013; Kirchner et al., 2013; Loomis et al., 2012; McCarthy et al., 2009; West et al., 2010); retailer compliance with POS display bans (Dubray, Schwartz, Garcia, Bondy, & Victor, 2009; Quedley et al., 2008; Widome, Brock, Noble, & Forster, 2012; Zacher et al., 2013); support for POS display bans (Brown et al., 2012; Wilson et al., 2010), and the relationship between exposure to tobacco advertising and smoking (Hanewinkel, Isensee, Sargent, & Morgenstern, 2011; Mistry et al., 2013).

### *Critical appraisal*

The methodological strengths and weaknesses of quantitative studies were systematically examined by LR. Specifically, the validity and suitability of the exposure and outcome measures, the risk of bias and confounding at outcome and study-levels, external validity, effect sizes, and overall strength of evidence was assessed for each study. Evidence supporting a causal relationship was assessed according to: strength, consistency, reversibility and plausibility of association, and evidence of a dose-response association and a temporal relationship (Hill, 1965). Qualitative studies were critically appraised in terms of the suitability of the sample, methods of data collection and analysis, generalisability of findings and extent of reflexivity (Kuper, Reeves, &

Levinson, 2008). Data were extracted to a summary table and final summaries were agreed upon following discussion between LR and RM.

## **Results**

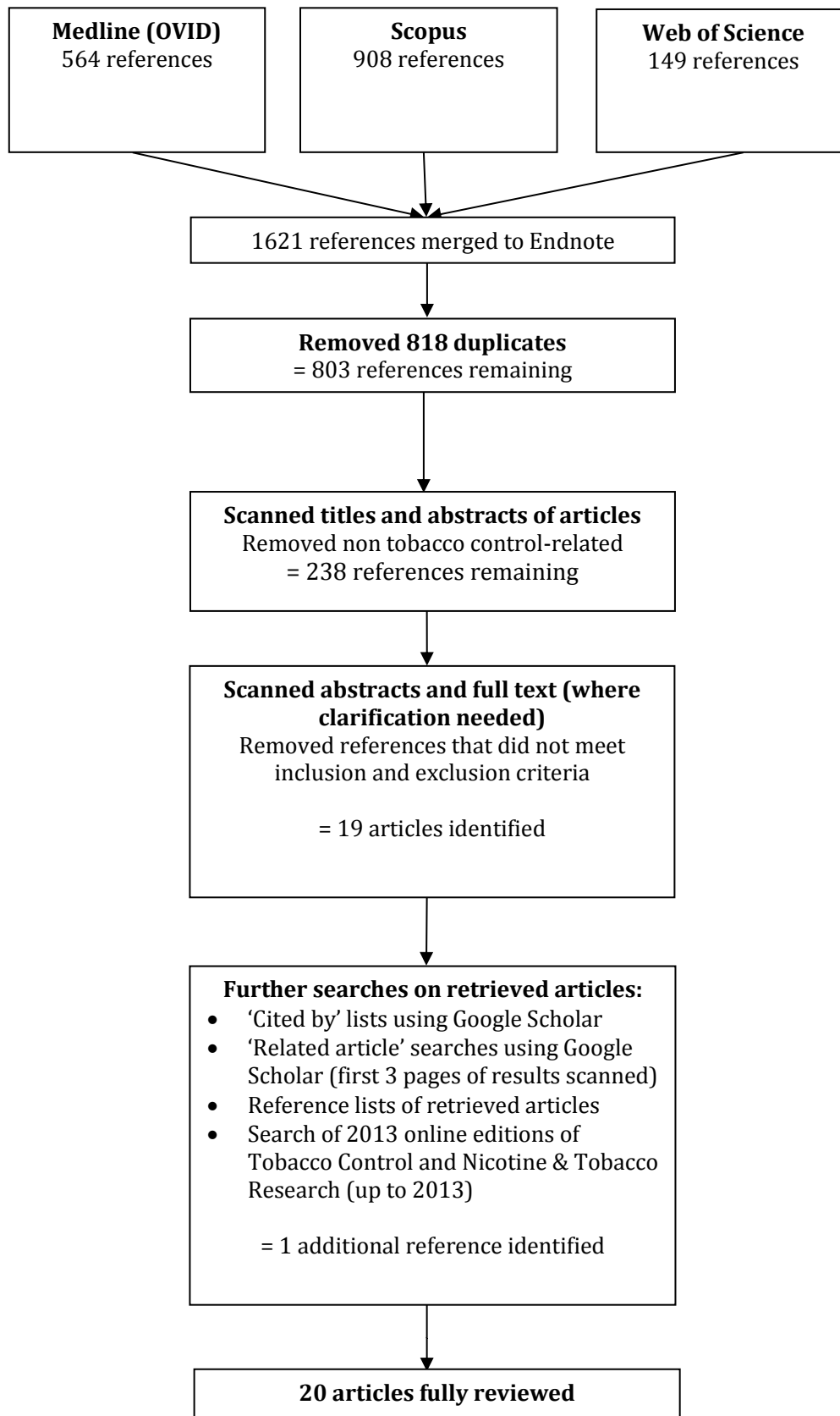
The initial literature searches yielded 803 potential articles (Figure 5). Of these, 19 were judged to have met the inclusion criteria for the review. Supplementary searches using the 19 articles resulted in the identification of one additional study meeting inclusion criteria, giving a total of 20 articles that were fully reviewed. Nine examined the association between exposure to POS tobacco promotion and smoking amongst children and young people. Of these, five were cross-sectional, one was experimental and three were longitudinal. Six articles examined quitting and tobacco purchasing behaviours amongst adult smokers; four were cross-sectional, one was longitudinal and one was qualitative. A further five studies evaluated the impact of POS display bans; these were predominantly quantitative pre- and post-legislation surveys, and one qualitative study was identified.

### ***Findings from studies of children and young people***

#### *Cross-sectional studies*

These studies used large-scale surveys to collect both exposure and outcome data cross-sectionally (Table 5); two linked outcome data to objective estimates of retail tobacco advertising within a school neighbourhood, or at the county-level (Henriksen et al., 2008; Kim, Loomis et al., 2013). Other exposure measures included self-reported awareness of, or attraction to, POS displays; store-visiting frequency, and cigarette brand recognition. Outcome measures were predominantly individual-level; the exception was school smoking prevalence (Henriksen et al., 2008). Two were conducted in the U.S., two in the UK and one in NZ, and samples comprised schoolchildren aged between 9 and 17 years old. Each of the five studies reported a positive association between exposure and outcome. This was the case across varied outcomes, including pro-smoking attitude, smoking susceptibility, experimental smoking, current smoking and school smoking prevalence, regardless of whether the exposure was frequency of visiting stores where tobacco was displayed or frequency of noticing tobacco in-store (Table 5).

Figure 5. Process of identifying articles for the systematic review



**Table 5. Cross-sectional and experimental studies of smoking and exposure to POS tobacco promotion in children and young people**

Author, year	Location, study year, participants	Study design	Exposure(s)	Outcome(s)	Analytical method	Adjustment	Results
(Henriksen et al., 2008)	California, U.S., 2005-06; 135 high schools (age of students unstated).	Cross-sectional, statewide school survey.	1. Density of retail cigarette adverts in school neighbourhood (none, moderate, high).	a. School smoking prevalence b. No. of cigarettes in past 30 days	Ordinary least squares regression.	School-level ethnicity & SES, school achievement, neighbourhood SES & population density, neighbourhood type (urban/ rural).	1a. Positive association: approx 2% increase in school smoking prevalence in neighbourhoods with any advertising vs no advertising. 1b. Not statistically significant
(Kim, Loomis et al., 2013)	New York state, U.S., 2004-08; 58,964 students aged 9-17 years.	Cross-sectional, statewide school surveys.	1. Mean cigarette adverts per store at county-level 2. Mean price promotions per store at county-level	a. Pro-smoking attitude b. Smoking susceptibility c. Retail stores usual source of tobacco d. Current smoking e. Frequent smoking f. Cigarettes per day	Logistic and linear regression. Stratified by smoking status and area.	Age, ethnicity, gender, student income, school smoking prevalence, living with smoker, county of residence, survey year.	1a. Positive association amongst non-smokers living outside of New York City (NYC) (AOR: 1.15, 95% CI: 1.05-1.25). 2b. Negative association for non-smokers living in NYC (AOR: 0.64, 95% CI: 0.48-0.86). 2d. Positive association for NYC youth (AOR: 1.57, 95% CI: 1.01-2.44) No other statistically sig. associations between remaining exposure & outcome variables.
(Kim, Nonnemaker et al., 2013)	U.S., year of data collection not stated, 1,216 children aged 13-17 years.	Experimental study; virtual shopping scenario.	Random assignment to 1 of 6 conditions: C1. Open POS display, ads in store C2. Enclosed display, ads in store C3. Enclosed display, ads in store, cabinet ads C4. Open display, no ads in store C5. Enclosed display, no ads in store C6. Enclosed display, no ads in store, cabinet ads.	a. Tobacco purchase attempt in virtual store b. Perceived ease of purchasing tobacco in real store	Logistic regression. Stratified by smoking status.	Age, ethnicity, sex, sensation-seeking, friends smoking, living with smoker, store visiting frequency, perceives virtual store resembles real store. Current smoker models controlled for usual source of cigarettes.	a. Compared to C1, the display ban conditions (C2, C3 & C6) were each associated with decreased odds of purchase attempt amongst never-smokers (AORs range 0.22 – 0.28) and current smokers (AORs range 0.27 – 0.39). b. Compared to C1, C5 was associated with decreased odds of perceiving cigarettes to be hard to purchase, amongst never-smokers only (AOR: 0.49, 95% CI: 0.28-0.85).
(MacKintosh, Moodie, & Hastings, 2012)	UK, 2008; 946 never-smokers aged 11-16 years.	Cross-sectional, nationwide survey.	1. Noticing POS tobacco displays during past month (yes/no) 2. Attraction to POS displays (continuous)	a. Smoking susceptibility	Logistic regression.	Age, gender, social grade, parental smoking, close friend smoking, sibling smoking. Attraction to POS display model controlled for display noticing.	1a. Positive association (AOR: 1.77, 95% CI: 1.15-2.73) 2a. Positive association (AOR: 1.07, 95% CI: 1.03-1.11)
(Paynter, Edwards, Schluter, & McDuff, 2009)	New Zealand, year of data collection not stated; 27,757 students aged 14-15 years.	Cross-sectional, nationwide survey.	1. Store visiting frequency (at least daily, 2-3 times week, weekly, less than weekly) 2. Frequency of noticing tobacco in-store (every time, most times, sometimes, hardly ever, never).	a. Experimental smoking (vs never-smoking) b. Smoking susceptibility c. Current smoking	Three-level mixed effect logistic regression.	Age, sex, ethnicity, peer and parental smoking, school-level SES, smoking in the home.	1a. Positive association: (AOR: 2.7, 95% CI: 2.4-3.1). 1b. Positive association: (AOR: 1.8, 95% CI: 1.6-2.2). 1c. Positive association: (OR*: 4.1, 95% CI: 3.4-4.9) *unadjusted odds reported. 2a. Positive association: (AOR: 1.5, 95% CI: 1.3-1.7). 2b. Positive association: (AOR: 2.0, 95% CI: 1.7-2.3). 2c. Positive association: (AOR: 3.5, 95% CI: 2.8-4.4). Associations above refer to most frequent vs least frequent exposure (i.e. ref).
(Spanopoulos, Britton, McNeill, Ratschen, & Szatkowski, 2014)	Nottingham, England, 2011; 5,376 children aged 11-15 years.	Cross-sectional, city-wide survey.	1. Store visiting frequency (almost every day, 2-3 times a week, once per week, less than once per week). 2. Frequency of noticing tobacco in-store (every time, most times, sometimes, hardly ever, never) 3. Cigarette brand recognition from retail tobacco displays (number identified).	a. Ever-smoking (vs never-smoking) b. Smoking susceptibility	Logistic regression.	Gender, SES, school year, ethnicity, perceived academic performance, rebelliousness/ sensation-seeking, parent and sibling smoking, home smoking status, friends smoking, perceived peer smoking prevalence.	1a. Positive association: (AOR: 2.23, 95% CI: 1.40-3.55) 1b. Positive association: (AOR: 1.62, 95% CI: 1.25 – 2.10) 2a. Not statistically significant (AOR: 1.67, 95% CI: 0.85-3.28) 2b. Positive association: (AOR: 3.15, 95% CI: 1.52-6.54) 3a. Positive association: (AOR: 1.05, 95% CI: 1.03-1.06) 3b. Positive association: (AOR: 1.04, 95% CI: 1.02 – 1.05) Associations refer to most frequent vs least frequent exposure (i.e. ref).

N.B. All relevant statistically significant associations are reported in the 'Results' column and the label for each association (e.g. 1a; 2b etc) refers to the exposure and outcome analysed, as indicated by the labels in the 'Exposure' and 'Outcome' columns. Abbreviations: Ref = reference group; ads = advertisements; sig. = significant; AOR = adjusted odds ratio

The most common outcome examined was smoking susceptibility. As described in Chapter 2, smoking susceptibility is an indicator of a never-smoker's predisposition to smoking, based on intentions and expectations of future behaviour, and has been validated as a predictor of future smoking amongst adolescents (Pierce et al. 1996). Compared with outcomes such as being a current or experimental smoker, the susceptibility measure provides greater confidence about the direction of an association between POS tobacco promotion and smoking. This confidence comes about because increased susceptibility amongst never-smokers is unlikely to result in greater exposure to POS tobacco since these individuals are not yet buying tobacco. The UK study sample consisted solely of children who reported having never smoked (MacKintosh et al., 2012). Both self-reported noticing of and attraction to POS tobacco displays were independently associated with increased smoking susceptibility after controlling for demographic and other smoking-related variables, thus providing convincing evidence of a true association, albeit with a small effect size (adjusted odds ratios AORs 1.07 and 1.77). Paynter et al. (2009) and Spanopoulos et al. (2014) used the same susceptibility measure but also examined current and experimental smoking as outcomes. Each study used self-reported store visiting frequency and frequency of noticing tobacco in-store as exposure measures. Together, these methodologically robust studies provide strong evidence of a small to moderate effect of POS tobacco displays on increased smoking and smoking susceptibility amongst children (AORs of 1.04-3.15), even after controlling for an extensive range of potential confounding factors.

Two studies used an ecological design, which minimises recall or social desirability bias in exposure assessment (Henriksen et al., 2008; Kim, Loomis et al., 2013). Henriksen et al. (2008) measured exposure by assessing the density of tobacco retail advertising around schools. Schools with any retail tobacco advertising in their neighbourhood had a smoking prevalence approximately 2% greater than those with none, though there was no association with number of cigarettes smoked in the past 30 days. However, the exposure assessment was limited since other factors, such as participants' store-visiting frequency, were not assessed. Kim, Loomis et al. (2013) used county-level estimates of POS tobacco advertising and price promotions as exposure measures, and a range of cognitive and behavioural smoking-related

outcomes. Living in a county with greater retail tobacco promotion was associated with greater odds of being a current smoker and of having a pro-smoking attitude (AORs 1.57 and 1.15, respectively). However, the main limitation with ecological studies is that associations observed at the population level cannot be assumed to be applicable at the individual-level (Sedgwick, 2014). In addition to this, there were inconsistencies in the results according to geographical area, and several analyses resulted in non-statistically significant results. It is plausible that the county-level exposure estimate may have masked variation in the actual exposure which, if non-differential, would have biased the results towards the null and may accounted for some of the non-statistically significant results. Uncontrolled confounding associated with differences between urban areas and the rest of the state may also explain the inconsistent results.

#### *Experimental study*

Kim, Nonnemaker et al. (2013) used an online scenario in which participants were asked to select any four items for purchase within a virtual store, and complete an online survey. Current smokers and never-smokers not exposed to POS tobacco displays in the scenario were less likely to attempt to purchase cigarettes compared to those who were exposed to POS tobacco displays (AORs 0.22 – 0.39). Removing retail cigarette advertisements alone had little effect on purchasing behaviour, which suggests POS displays in particular may be most salient to youth. The randomised design is a particular strength of the study, as the observed differences between the experimental conditions are highly unlikely to have been confounded by an unmeasured variable. Although external validity is a limitation of this type of research, the strength of randomised experimental studies such as this is that they provide convincing evidence of a causal relationship.

#### *Cohort study*

Shadel et al. (Shadel, Martino, Setodji, & Scharf, 2013) used an EMA methodology, whereby participants used smartphones to log the number of real-time exposures to POS tobacco advertising encountered over a 21-day period (Table 6). Outcome data were self-reported smoking susceptibility ratings, and participants were found to report higher levels of smoking susceptibility following exposure to POS tobacco



advertising, compared to random intervals during the day. An important limitation to these findings is that 61% of participants were ever-smokers and 37% of these reported smoking in the past month, therefore this measure of susceptibility is not as strong as the validated measure used in other studies (e.g. MacKintosh et al., 2012).

Dauphinee et al. (Dauphinee, Doxey, Schleicher, Fortmann, & Henriksen, 2013) examined the relationship between never-smokers' cigarette brand recognition at baseline and risk of smoking initiation over 12-months. Exposure to POS tobacco promotion was estimated by testing students' ability to name three brands represented in photographs of retail tobacco advertisements (with brand names removed). Never-smokers at baseline who recognised the Newport brand were significantly more likely to report having tried smoking 12-months later (AOR: 1.49, 95% CI: 1.04 – 2.15). Neither recognition of Camel nor Marlboro was associated with ever-smoking. A limitation with this exposure measure is that children's recognition of cigarette brands may follow exposure to the packs smoked by parents or friends, or to advertisements at locations other than the POS. These factors make it difficult to conclude that the association with Newport brand is directly attributable to POS promotion. However, the analyses controlled for friend and family member smoking, and a store-visiting frequency measure was also included in the statistical models. Store-visiting frequency was not significantly associated with smoking initiation, though the AORs were in the expected direction (range 1.12-1.17). Thirty-eight percent of the sample (n=726) were lost to follow-up, and those students lost had significantly higher store visiting rates at baseline, meaning the reported results may be biased towards a null association.

A prospective cohort study among never-smokers (Henriksen, Schleicher, Feighery, & Fortmann, 2010) used frequency of store-visiting and noticing tobacco as exposure measures, and a more objective composite variable based on tobacco promotion in stores around participating schools. The outcome, smoking initiation, was found to be positively associated with each exposure measure at both 12- and 30-months (with one exception), even after controlling for a range of confounding variables. Findings were consistent with cross-sectional studies (MacKintosh et al., 2012; Paynter et al., 2009; Spanopoulos et al., 2014), with small to moderate effect sizes observed (AORs 1.11 – 2.58), and provide strong evidence of a causal relationship.

**Table 6. Longitudinal studies of smoking and exposure to POS tobacco promotion in children and young people**

Author, year	Location, study year, participants	Study design	Exposure(s)	Outcome(s)	Analytical method	Adjustment	Results
(Dauphinee et al., 2013)	Tracy, California, 2006-2008; 1,179 never-smokers aged 11-15years at baseline	Prospective cohort study, 12-month follow up	1. Cigarette brand recognition (yes/no for 3 brands) 2. Store visiting frequency (sum of visits per week for 3 store types)	a. Ever-smoking (vs never-smoking)	Hierarchical general linear models	Gender, ethnicity, school year, survey year, school performance, unsupervised days after school, risk-taking propensity, smoker at home, friend who smokes.	1a. Positive association for Newport brand recognition (AOR: 1.49, 95% CI: 1.04-2.15). Associations for Camel and Marlboro not statistically significant. 2a. Associations not statistically significant (AORs range 1.12-1.17).
(Henriksen et al., 2010)	Tracy, California, 2003-2005; 1,356 never-smokers aged 11-14 years at baseline	Prospective cohort study, 12-month and 30-month follow-up	1. Store visiting frequency (low, moderate, high) 2. Frequency of noticing tobacco advertising in-store (often vs less than often) 3. Composite 'brand exposure' measure (based on store visiting frequency and objective assessment of in-store advertising; low, moderate, high)	a. Ever-smoking (vs never-smoking)	Logistic and linear regression analysis	Gender, ethnicity, racial/ minority status, parent/ household smoking, friend smoking, exposure to tobacco in movies/ TV, school year, academic performance, risk-taking propensity & unsupervised time after school. Brand exposure model controlled for noticing tobacco in-stores.	1a. Positive association both at 12-month (AOR: 2.58, 95% CI: 1.68-3.97) and 30-month follow-up (AOR: 1.42, 95% CI: 1.19-1.69). 2a. Not statistically significant at 12-months (AOR: 0.90, 95% CI: 0.74-1.1) but positive association at 30-month follow-up (AOR: 1.11, 95% CI: 1.02-1.22) 3a. Positive association both at 12-month (AOR: 2.36, 95% CI: 1.55-3.61) and 30-month follow-up (AOR: 1.58, 95% CI: 1.05-2.37). Associations above refer to most frequent/ highest vs least frequent/ lowest exposure (i.e. ref).
(Shadel et al., 2013)	Location unspecified, U.S., 2010-11; 134 college students (mean 21 years)	EMA	1. Real-time viewing of POS tobacco promotion (total number in 21 days)	a. Smoking susceptibility	Hierarchical linear mixed model.	Gender, ethnicity, day of week, smoking status.	1a. Positive association: higher susceptibility following exposure to POS tobacco promotion compared to the randomly sampled prompts (adjusted B co-efficient =0.13, p<0.001).

N.B. All relevant statistically significant associations are reported in the 'Results' column and the label for each association (e.g. 1a; 2b etc) refers to the exposure and outcome analysed, as indicated by the labels in the 'Exposure' and 'Outcome' columns.

Abbreviations: Ref = reference group; ads = advertisements; sig. = significant; AOR = adjusted odds ratio; EMA = Ecological Momentary Assessment

### *Findings from studies examining the impact of POS promotion on adult smoking*

These six studies varied in design (Table 7); two comprised post-purchase interviews (Carter, Mills, & Donovan, 2009; Clattenburg, Elf, & Apelberg, 2012), one was a diary-style study (Burton, Clark, & Jackson, 2012), and two were surveys (Wakefield, Germain, & Henriksen, 2008); one with an 18-month follow-up (Germain, McCarthy, & Wakefield, 2010). Four were conducted in Australia and one in the U.S. Exposure measures included viewing tobacco at POS, self-reported store-visit frequency, and noticing of POS displays. Each study examined individual-level outcomes, including smoking-, quitting- and tobacco purchasing-related behaviours, and perceptions about the influence of POS promotion. Samples comprised adult smokers, with recent quitters also included as a sub-group in one study. Differences in study design limit comparisons, though in the three studies that used regression analyses, the findings were consistent: positive associations were reported between exposure to POS tobacco promotion and smoking and tobacco purchasing (including urge to purchase and impulse purchase), and a negative association between exposure to POS tobacco and abstinence from smoking.

Both post-purchase survey studies (Carter et al., 2009; Clattenburg et al., 2012) found that a small to moderate proportion of tobacco purchases were made on impulse, and approximately one third of smokers agreed POS promotion made quitting smoking more difficult; a similar finding was also reported by Wakefield et al. (2008). Immediate post-purchase interviews minimise any inaccurate recall associated with retrospective reporting of impulse purchasing. However, each study used only self-reported data, and the use of direct, and potentially leading, questioning about the role of POS displays, e.g. "Did the cigarette displays encourage you in any way to purchase cigarettes in this instance?" may have influenced participants' responses (Carter et al., 2009). The studies largely rely on descriptive data and do not have comparative information from controls not exposed to POS displays; these attributes limit conclusions that can be drawn about an association between POS display exposure and tobacco purchasing behaviour.

**Table 7. Quantitative studies of smoking and exposure to POS tobacco promotion amongst adult smokers**

Author (year)	Location, study year, sample	Study design	Exposure(s)	Outcome(s)	Analytical method	Adjustment	Results
(Burton et al., 2012)	New South Wales, Australia, 2007-08; 1,109 adult smokers (mean age not stated)	Diary-style study	1. Real-time viewing of POS tobacco displays over 4-day study period (yes/ no within each 4-hour interval)	a. Smoking within 4-hr interval b. No. of cigarettes smoked in 4-hr interval c. Tobacco purchase in 4-hr interval	Multi-level regression modelling and lagged regression analysis.	Age, gender, smoking status, SES, presence of friend/ family smoking, presence of others smoking. Participants that saw POS displays and purchased tobacco in same interval were excluded. Lagged analysis adjusted for purchase of cigarettes in previous 4-hr period.	1a. Positive association: (AOR: 1.45, 95% CI: 1.36-1.55) 1b. Positive association: (Event Rate Ratio: 1.21, 95% CI: 1.16-1.26) 1c. Marginally significant association (AOR: 1.15, 95% CI: 0.99-1.34, p=0.066)
(Carter et al., 2009)	Perth, Australia, year of study not stated; 206 adult daily smokers (mean age 37 years)	Face-to-face post-purchase survey	All participants exposed to POS tobacco display whilst purchasing tobacco in store immediately prior to survey.	a. Unplanned tobacco purchase b. Factors in-store that prompted purchase c. Agreed POS display encouraged purchase d. Purchased non-usual brand e. Factors that prompted non-usual brand purchase f. Agreed POS display encouraged non-usual brand purchase g. Agreed removing POS displays would make quitting easier.	Descriptive statistics and chi-squared test.	Not applicable.	a. 22% (n=45) made unplanned purchases b. 8% (n=16) spontaneously said POS display prompted purchase c. 19% (n=40) agreed POS display had encouraged purchase. Greater tendency to report being influenced by tobacco displays among unplanned than planned purchasers (47% vs 12%, p<0.001). d. 5% (n=11) purchased non-usual brand e. none spontaneously said POS display prompted non-usual brand purchase f. 3% (n=6) said POS display had encouraged non-usual brand purchase g. 28% (n=58) agreed removing POS displays would make quitting easier
(Clattenburg et al., 2012)	Vermont, U.S., 2010; 301 adult smokers (median age 32 years)	Face-to-face post-purchase survey	All participants exposed to POS tobacco display whilst purchasing tobacco in store immediately prior to survey.	a. Unplanned tobacco purchase b. Factors in-store that prompted unplanned purchase c. Agreed POS tobacco promotion influences cigarette brand or product purchased d. Purchased non-usual brand e. Agreed POS promotion makes quitting harder.	Descriptive statistics	Not applicable.	a. 11% (n=34) made unplanned purchases b. 76.5% (n=26) said POS promotion prompted unplanned purchase c. 13% (n=39) agreed POS influences brand/ product choice d. 14% (n=43) purchased non-usual brand e. 31% (n=94) agreed POS promotion makes quitting harder.
(Germain et al., 2010)	Victoria, Australia, 2008, 222 adult smokers (mean age 42.6 years)	Prospective cohort study, 18-month follow-up	1. POS display sensitivity (low, medium, high).	a. Having quit smoking (vs smoking) b. Quit attempt in previous 18 months	Logistic regression analysis	Sex, SES, age and no. of cigarettes per day	1a. Negative associations: (AOR: 0.27, 95% CI: 0.08-0.91), for high vs low POS sensitivity. Also significant for medium vs low POS sensitivity (AOR: 0.32, 95% CI: 0.14-0.74). 1b. No statistically significant associations
(Wakefield et al., 2008)	Victoria, Australia, 2006, 2,996 adults (506 smokers, 67 recent quitters; average age not stated),	Cross-sectional, statewide survey	1. Store visiting frequency daily (vs not daily) 2. Frequency of noticing tobacco in-store at least sometimes (vs rarely/ never).	a. Impulse purchasing cigarettes due to POS displays b. Agreement that removing POS displays would make quitting easier c. Urge to buy cigarettes after seeing POS displays (amongst attempting quitters)	Descriptive statistics and logistic regression.	Age, sex, SES, cigarette consumption level, quit attempt in past 12 months, considering quitting in next 6 months.	Descriptive statistics: a. 25% purchased due to seeing POS displays at least sometimes b. 31% agreed/ strongly agreed removing POS displays would help quitting c. 38% said seeing POS displays had caused urge to buy cigarettes Regression: 1a. Association not statistically significant (AOR: 1.39, 95% CI: 0.86-2.24). 1b. Association not statistically significant (OR not reported). 1c. Positive association: (AOR: 2.11, 95% CI: 1.05-4.25). 2a. Positive association: (AOR: 2.49, 95% CI: 1.29-4.80). 2b. Positive association: (AOR: 2.38, 95% CI: 1.35-4.17). 2c. Positive association: (AOR: 3.88, 95% CI: 1.36-11.03).

N.B. All relevant statistically significant associations are reported in the 'Results' column and the label for each association (e.g. 1a; 2b etc) refers to the exposure and outcome analysed, as indicated by the labels in the 'Exposure' and 'Outcome' columns.

The large, population-based survey by Wakefield et al. (2008) is a more methodologically robust examination. More frequent noticing of POS tobacco displays was associated with greater odds of impulse purchasing and having an urge to purchase tobacco, and daily store visiting was also associated with greater urge to purchase tobacco (AORs range 2.11 – 3.88). Limitations include reliance on self-reported data, and retrospective reporting of impulse tobacco purchases. Due to their nature, unplanned purchases may be under-reported, though if this were the case, it would have biased the associations towards the null, resulting in an underestimate of the association. Retrospective reporting of quit attempts during the past 12 months may also have been underestimated, though any effect would have been a reduction in the size of this subgroup of participants, rather than changing the associations reported.

Collecting real-time exposure and outcome data, as one study did (Burton et al., 2012) overcomes the limitations associated with self-reported data. Participants recorded whether they had seen cigarettes for sale during each four-hour period that they were awake over four days. A lagged analysis was used to examine whether exposure to POS displays in one period predicted tobacco purchase in the following period whilst controlling for prior period purchase. Participants who had purchased tobacco in the same four-hour period as their recorded exposure to POS displays were excluded from the analyses, providing more certainty as to the direction of the association observed. The main finding was a small and marginally significant association between exposure to POS displays and subsequent purchase of tobacco. This approach would likely have provided a more conservative estimate of the true size of the association since the excluded data would have included those participants who made their tobacco purchase decision as a result of a separate, prior exposure to POS displays within the same four-hour period, or on impulse.

A methodologically robust prospective study of smokers in Australia (Germain et al., 2010) found that smokers who were more sensitive to POS displays were around 70% less likely to have quit smoking at 18-month follow-up compared to those who were less sensitive. Sensitivity to POS displays was not associated with attempts to quit during the follow-up. The use of a composite sensitivity variable (based on three

measures of exposure to POS promotion) is a strength, although each of the measures was self-reported. The attrition rate between baseline and follow-up was 51%: it is not known whether those lost to follow-up differed from the remaining sample in terms of quit status, though there were no differences between groups in POS sensitivity or number of cigarettes per day. The likely effect of the high attrition would be reduced power due to the smaller sample size at follow-up, though in spite of this limitation, the association between exposure and the main outcome was statistically significant.

### *Qualitative study*

A NZ study conducted with a sample of smokers used in-depth interviews to investigate how tobacco retail displays affect smoking behaviour and quit attempts (Hoek, Gifford, Pirikahu, Thomson, & Edwards, 2010). Thematic analysis suggested that the size, prominence and position of tobacco displays were aspects of the POS environment relevant to smokers and recent quitters. Some participants felt unaffected by tobacco displays, while others felt tempted by them, and cravings often prompted purchase. Exposure to tobacco brand imagery often primed sensations relating to smoking rituals and their perceived benefits to the smoker. The in-depth interview approach was an appropriate methodology, and the overall approach was pragmatic, with an emphasis on policy implications. The sampling approach was consistent with 'typical case sampling' (Kuper et al., 2008), and the sample representative of typical long-term smokers in NZ.

### *Studies evaluating the impact of POS tobacco display bans*

Two studies used nationwide pre- and post-legislation surveys (McNeill et al., 2010; Scheffels & Lavik, 2012) and one used a longitudinal cross-country comparison (Li et al., 2013) to evaluate the impact of POS display bans; in each study the post-legislation follow up period was 12 months or less. The remaining studies included an analysis of national retail tobacco sales (Quinn, Lewis, Edwards, & McNeill, 2010), and a qualitative methodology (Burton, Spanjaard, & Hoek, 2013) (Table 8). Two were conducted in Ireland, one in Norway, and the multi-country study included Australia, Canada, the U.S. and the UK. The varied samples comprised population-based samples of adults, young people, smokers and former smokers. A variety of smoking and tobacco purchasing-related outcome measures were examined. While there are some

inconsistencies in the findings, the studies provide evidence that POS bans may contribute to a shift in perceptions about smoking and lower rates of impulse tobacco purchasing. There was no evidence of a short-term impact of POS display bans on population-level smoking outcomes.

The multi-country prospective longitudinal study (Li et al., 2013) provides good evidence of lower rates of impulse purchasing of tobacco in Canadian and Australian jurisdictions that have POS display bans, compared to the UK and U.S. where display bans had not yet been implemented. This outcome was observed irrespective of whether impulse purchasing was measured by direct self-report or by self-reported non-usual brand purchase. A strength of the study is its use of both country-level and individual-level exposure data, particularly because Australian states varied in the status of POS display bans at the time of data collection, and the findings were consistent regardless of the exposure measure used. The use of retrospective self-reported outcome measures is a limitation. It remains plausible that other differences between the countries' tobacco control policies may have influenced the results, though this is unlikely given that the survey questions were specifically worded to assess the role of POS promotion on purchasing.

The Norwegian study evaluated consumers' perceptions of the POS display ban implemented in January 2010 (Scheffels & Lavik, 2012). Around a quarter of smokers reported being tempted to buy tobacco when exposed to POS displays pre-legislation, and most agreed the ban would make smoking uptake more difficult. Nine months post-ban around 20% agreed the ban had made it more difficult to buy tobacco. Overall, the surveys provide a subjective indication of the impact of POS bans, given the reliance on self-reported perceptions of the ban and descriptive data analyses. In the qualitative component, some occasional and former-smokers reported that the POS display ban could prevent impulse purchasing, and smoking initiation by reducing brand attachment, and denormalisation of smoking. The semi-structured interview approach was appropriate for the research question, and provides useful detail about possible mechanisms linking POS tobacco displays and smoking.

**Table 8. Quantitative studies evaluating the impact of removing POS tobacco promotion on smoking and cigarette sales**

Author (year)	Location, study year, participants	Study design	Exposure(s)	Outcome(s)	Analytical method	Adjustment	Results
(Li et al., 2013)	Australia, Canada, US & UK, adult smokers, Wave 5 (n=8242) 2006-07; Wave 6 (n=8193) 2007-08; Wave 7 (n=7206) 2008-09; Wave 8 (n=5939) 2010-11	ITC Four Country Survey	1. Presence of POS displays country-level; (present in UK and US; banned in Canadian and Australian jurisdictions) 2. Individual-level; resides in display ban area (vs area without ban).	a. Impulse purchase as a result of seeing POS promotion (Wave 8 only) b. Non-usual brand purchase due to POS promotion (Waves 6, 7 & 8)	Descriptive statistics; logistic regression for same year cross-country comparison; GEE modelling for over-wave comparison.	Age, sex, education level, income and cigarettes per day.	1a. Positive association: greater odds of impulse purchase due to POS displays in the US (OR: 3.26, 95% CI: 2.13-4.99) and UK (OR: 2.49, 95% CI: 1.58-3.91) compared to Canada; no significant difference in odds of impulse purchase between Canada and Australia. 1b. The odds of non-usual brand purchase were significantly lower in wave 8 vs wave 6 in Australia (AOR: 0.71, 95% CI: 0.53-0.95) and Canada (AOR: 0.58, 95% CI: 0.46-0.73), though not in the UK (OR: 0.89, 95% CI: 0.73-1.08). In the US there was a significant decline in purchase of non-usual brands because of POS across waves, though this was high at each wave. 2a. Negative association: residing in area with display ban associated with lower impulse purchase (AOR: 0.39, 95% CI: 0.27-0.54) 2b. Negative association: residing in area with display ban associated with lower non-usual brand purchase due to display (AOR: 0.35, 95% CI: 0.24-0.52).
(McNeill et al., 2010)	Ireland; data collection 2002-2010; i) 1,000 adults (mean age unstated); ii) 180 youth aged 13-15 years	Pre- and post-legislation study, comprising i) monthly survey of adults, ii) 2 surveys of youth	1. Legislation banning POS tobacco promotion (pre- vs post-implementation)	a. Smoking prevalence (adults) b. Perception that ban made quitting easier (adult smokers) c. Smoking status (children) d. Perception that attempted tobacco purchase would be successful (children) e. Overestimation of peer smoking prevalence (children) f. Perception that ban makes it easier not to smoke (children)	Time series analysis; descriptive statistics and chi-squared; logistic regression analysis.	Survey data weighted for demographic factors. Time series analysis adjusted for underlying trends and autocorrelation.	1a. No statistically significant difference 1b. Decreased from 20% 3 months pre-ban to 10% 3 months post (p<0.001), then rose to 14% 7 months post-ban. 1c. No statistically significant difference 1d. No statistically significant difference 1e. Lower odds of children overestimating peer smoking prevalence post-ban (OR: 0.30, 95% CI: 0.16-0.57) vs pre-ban. 1f. No statistically significant difference
(Quinn et al., 2010)	Ireland, 2006-09; nationwide sample (n=1,956 in 2009) of retail outlets.	Pre- and post-legislation study, analysis of cigarette-pack sales data.	1. Legislation banning POS tobacco promotion (pre- vs post-implementation)	a. National-level retail cigarette-pack sales	Time series analysis	Seasonality, trading-day and cyclical variation, secular trends.	1a. No impact on retail cigarette pack sales attributable to the legislation.
(Scheffels & Lavik, 2012)	Norway, 2009-2010; i) 3 surveys, approx 900 adults 15-54 yrs for each survey; ii) 62 smokers & ex-smokers aged 16-50 yrs (focus groups)	Pre- and post-legislation study, comprising i) 3 surveys of adults; ii) focus groups	1. Legislation banning POS tobacco promotion (pre- vs post-implementation)	a. Reported temptation to buy tobacco when exposed to PoS displays (pre-ban) b. Perception that ban would make/has made quitting easier c. Perception that ban would make/has made smoking uptake more difficult d. Agreement that ban has made brand choices more difficult (3 <sup>rd</sup> survey only) e. Agreement that ban has made buying tobacco more difficult (3 <sup>rd</sup> survey only).	Descriptive statistics	Not applicable	1a. 26% of smokers reported being tempted when exposed to PoS displays often or sometimes. 1b. From timepoints 1-3 a progressively lower proportion of occasional smokers (p=0.05) thought the ban would make it easier to quit (55% pre-ban vs 39% 9 months post-ban). Same trend for daily smokers (27% pre-ban vs 21% 9 months post-ban) 1c. Overall agreement that ban would make uptake more difficult- no significance difference by timepoint; but agreement highest amongst non-smokers, lowest amongst daily smokers. 1d. 32% agreed ban had made it more difficult to choose brand. 1e. 20% agreed ban had made it more difficult to buy tobacco.

N.B. All relevant statistically significant associations are reported in the 'Results' column and the label for each association (e.g. 1a; 2b etc) refers to the exposure and outcome analysed, as indicated by the labels in the 'Exposure' and 'Outcome' columns.



An Irish study examined survey data before and after a ban on POS displays and advertising in July 2009 (McNeill et al., 2010). Post-ban, children were significantly less likely to over-estimate peer smoking prevalence compared to pre-ban, which suggests the removal of POS tobacco displays may contribute to the denormalisation of tobacco products amongst children. The proportion of adult smokers who believed the ban would make quitting easier increased from 10% three months post-ban to 14%, seven months post-ban. No statistically significant changes in smoking behaviour were observed, which is unsurprising given the short-term nature of this study and the small sample size for the surveys of children. The authors note that it was not possible to disentangle the independent effects of a POS display ban and a concurrent ban on in-store tobacco advertising on participants' responses. Secondly, other tobacco control measures such as annual tax increases on tobacco may have confounded the results. Lastly, the use of quota sampling (as opposed to random selection) may have introduced bias and may also limit the generalisability of the findings. Another Irish study examined retail cigarette sales data as the outcome measure and found no difference in the level of retail cigarette sales as a result of the display ban (Quinn et al., 2010).

#### *Qualitative study*

An Australian study, comprising in-depth interviews and diary-style data collection with 31 smokers and attempting quitters, investigated how the tobacco retail environment affected tobacco purchases or smoking after the implementation of POS display bans (Burton et al., 2013). Thematic analysis of interviews suggested that a decrease of environmental smoking cues reduces temptation to smoke and contributes to lower smoking. However, even in the absence of POS tobacco promotions, participants reported that images of tobacco retailers, and of tobacco storage cupboards, triggered thoughts about smoking. The diary-style data indicated that, in a real-world situation, seeing a tobacco retailer often prompted smoking or tobacco purchase. Little detail on the sampling strategy was provided, making the sample representativeness difficult to ascertain.

### *Assessment of causality*

The AORs reported in observational studies of children and young people ranged from between 1.04 and 3.15 for smoking susceptibility; between 1.05 and 2.7 for experimental or ever-smoking, and between 1.57 and 3.50 for current smoking. In studies with adult smokers, the AORs ranged from 1.15 to 2.49 for impulse purchasing or self-reported smoking; from 2.11 to 3.88 for urge to purchase, and 0.27 to 0.32 for abstinence from smoking. The consistency of results, both internally within each study, and across different countries, settings, study designs and measures provides further support for a causal association between POS tobacco promotion and smoking behaviour and cognitions. Five studies were able to assess dose-response relationships (Germain et al., 2010; Henriksen et al., 2008; Henriksen et al., 2010; Paynter et al., 2009; Spanopoulos et al., 2014) and of these, four provided strong evidence of a positive dose-response association between POS promotion exposure and smoking or smoking susceptibility. The remaining studies did not attempt to assess dose-response associations.

Two prospective cohort studies (Dauphinee et al., 2013; Henriksen et al., 2010) each found statistically significant associations between POS display exposure or sensitivity and smoking behaviour over the follow-up period, providing good evidence of a temporal relationship. Further support for a temporal relationship is provided by the three studies that found statistically significant associations between POS promotion exposure and susceptibility amongst never-smokers. Smoking susceptibility is useful in terms of assessing causality since, for never-smokers, tobacco purchasing cannot plausibly have influenced exposure to POS tobacco promotion (therefore the reverse causation explanation is not valid). One study used lagged analysis to control for tobacco purchasing behaviour that occurred in the same time period as the exposure, though the results were marginally significant. The intervention studies provide evidence of the reversibility of the effect of POS tobacco promotion on impulse purchasing and on overestimating smoking prevalence. Significant associations between POS promotion exposure and measures such as pro-smoking attitudes, urges to purchase and unplanned tobacco purchases support the plausibility of a relationship between POS tobacco promotion and increased smoking, and the qualitative studies provide further support to this end.

## Discussion

This study extends the work by Paynter & Edwards (2009) and reports similar findings, using an evidence base that is now much more extensive than that which existed prior to 2008. A total of eighteen quantitative studies and two qualitative studies were identified, each of which reported results consistent with a positive association between exposure to POS tobacco promotion and smoking.

In terms of research with children and youth, the nine studies reviewed were heterogeneous in their design, study location and exposure and outcome measures, similar to the range reviewed by Paynter and Edwards (2009). Both reviews found the majority of evidence indicated a positive association between exposure to POS tobacco promotion and smoking, regardless of whether the outcome was pro-smoking attitudes, smoking susceptibility, smoking status, or school smoking prevalence. The 2009 review reported ORs for daily or current smoking ranging from 1.1 to 3.0; for ever-smoking from 1.1 to 2.0; and for susceptibility from 1.3 to 1.6, which are consistent with the ORs in the studies reviewed in this chapter. The main difference between our review and Paynter & Edward's is that the recent studies appear to provide even stronger evidence of an association than those analysed in the 2009 review. Firstly, smoking status was the most common outcome examined in the earlier studies, which limited conclusions regarding the direction of the association: starting to smoke could plausibly cause more store visits or greater awareness of POS tobacco promotion. However, more of the recent studies examined susceptibility amongst never-smokers. Evidence of an association between POS promotion and susceptibility is particularly compelling because, since these individuals are not smoking, tobacco purchasing behaviour cannot have caused more exposure to POS tobacco promotion. Secondly, no studies in the 2009 review assessed dose-response relationships, whereas five of the studies we reviewed did, of which four were consistent with a dose-response association.

Regarding research with adult smokers, a comparison of this evidence between the two reviews is limited since only two adult studies were included in the 2009 review, one of which was an experimental study that included a craving outcome measure (Carter et

al., 2009) not used in any of the more recent studies. We identified five quantitative studies and one qualitative study with adult smokers; each study suggested that exposure to POS tobacco promotion was associated with increased risk of smoking, impulse purchasing of tobacco, or having an urge to buy tobacco. While strengths of these studies include 'real-world' retail settings, they used subjective outcome measures and descriptive statistical analyses, and there is a need for more research in this area. Only one provided robust evidence consistent with a causal relationship, since it met criteria for both a dose-response association and a temporal relationship (Germain et al., 2010).

This review provides the first analysis of the available evidence examining the impact of POS tobacco display bans. A cross-country comparison of smoking survey data suggests that there are lower rates of tobacco impulse purchases in jurisdictions that have implemented POS display bans. Evidence also suggests that the introduction of POS display bans may contribute to a decrease in children's perception of peer smoking prevalence, which has important implications for the denormalisation of tobacco. To date, there is no evidence that POS display bans have reduced smoking prevalence, though this finding is unsurprising, given no studies have yet assessed outcomes over a period of more than one year post-ban. Bans on POS tobacco displays and promotion are likely to affect smoking behaviour through the denormalisation of tobacco and by providing a supportive environment for smokers to quit. Thus any impact on smoking as a result of these processes is likely to be observed over a longer-term period.

Tobacco industry-funded reports published since Paynter & Edwards' review have claimed that the evidence for an association between POS tobacco marketing and smoking is methodologically flawed (Basham, 2010; Gunter, Undated; Keegan, 2010). The criticisms in these industry funded reports centre on: i) the validity and reliability of the exposure and outcome measures, ii) the "small" effect sizes and non-statistically significant results, iii) a lack of 'real-world' research, and iv) a lack of randomised controlled trials (RCTs). However, many of these assertions are inaccurate and do not appear to consider epidemiological principles.

For example, several of the exposure measures used have been previously validated (Feighery, Henriksen, Wang, Schleicher, & Fortmann, 2006). In any epidemiological research, the crucial consideration is whether any inaccuracy related to the exposure is in some way systematically associated with the outcome, as such a bias could account for the observed associations. The fact that smoking susceptibility was used as an outcome in several studies largely overcomes this potential bias, since it is highly unlikely that susceptible never-smokers and non-susceptible never-smokers differ in the accuracy of their store visit frequency reports. The use of non-behavioural outcome measures, such as attitudes and perceptions about smoking, has also received criticism. However, tobacco industry documents themselves suggest the importance of influencing perceptions about smoking as a mechanism to recruit new smokers (Ling & Glantz, 2002). The validity of the smoking susceptibility measure in particular has been questioned, despite evidence that this measure is a significant predictor of smoking behaviour amongst never-smokers over a four-year period (Pierce et al., 1996). Industry-funded reports have attempted to argue that the limitations associated with exposure and outcome measures used in this body of research render the evidence flawed. In fact, from an epidemiological perspective, the consistency of findings across different study designs and measures provides highly convincing evidence to support the association between POS tobacco promotion and smoking.

One industry-funded report criticises the effect sizes that have been found (Basham, 2010), yet while these may be considered small to moderate, effects such as these accumulate to produce meaningful outcomes at a population-level. Furthermore, it is plausible that the existing research may underestimate the true effect size, which may also account in part for some of the non-statistically significant results. Studies may underestimate or fail to detect an association where the exposure to a risk factor is homogenous in a population, such as in the case of ubiquitous POS tobacco promotion (Rose, 2001). Other studies may also have provided a conservative estimate of the true association, through differential loss to follow-up (Henriksen et al., 2012) and exclusion of same-time-period impulse purchases (Burton et al., 2012). The use of unplanned purchasing as an outcome is likely to provide a conservative estimate of an association, since these purchases by their very nature are likely to be under-reported. Several studies were conducted in jurisdictions with prohibitions on in-store tobacco

advertising and promotion, other than POS displays, which suggests that stronger associations may be found in countries with more extensive retail tobacco advertising.

Criticisms have also been made both in terms of the lack of 'real-world' research, and the lack of RCTs. However, there is an emerging body of 'real-world' research conducted using EMA, diary-style and post-purchase interview protocols, which provide valuable data. Studies using these more novel methods have produced data supporting the same conclusions as those arising from studies using more traditional methodologies. Randomised controlled trials may be an especially rigorous study design in terms of showing causal relationships, yet these would be extremely difficult to conduct in this area given that smoking outcomes in two similar communities, which differ only in terms of POS marketing legislation, would need to be compared, and retailers persuaded to take part in a study where they agreed to be assigned at random to having POS displays removed. These conditions would be difficult to meet, particularly as there will be a perception that participation could result in competitive disadvantage and reduced sales and income. However, the experimental study design by Kim, Nonnemaker et al. (2013) is as close to an RCT as is feasible, and provides good evidence that banning POS tobacco promotion may be associated with lower risk of tobacco purchasing amongst youth.

Some limitations to the existing evidence should be noted. Studies carried out in jurisdictions with few or no restrictions on retail marketing of tobacco do not enable us to disentangle the independent effect of the POS display on smoking outcomes from the overall effect of in-store tobacco promotion. The majority of existing research is cross-sectional, and further prospective studies are needed to strengthen the evidence of a causal association. Most of the studies controlled for a comprehensive range of confounding factors though, as with any observational research, it is possible that an uncontrolled confounding factor, such as greater access to tobacco retail outlets, may have impacted the results. More research on the relationship between POS promotion and quitting-related outcomes is needed. There is also a need for longer-term evaluations of the impact of POS display bans, as no studies have yet been published examining outcomes beyond 12 months. Further research in this area will be invaluable for countries that have not yet implemented POS display bans. Three

studies in this review consisted of qualitative research, and in all qualitative studies there is the potential for power relationships between researchers and participants to have affected participants' expressed views. As smoking has become less socially desirable, participants may tend to attribute responsibility for their smoking towards environmental cues such as tobacco displays when discussing their opinions with an interviewer. Equally possible, is the 'third-person effect' (Davison, 1996), where participants tend to underestimate any influence of environmental factors on their own behaviour, while acknowledging that the same effects are likely to impact on others' behaviour. However, the importance of qualitative studies is in the detail they provide about possible mechanisms underpinning a relationship between POS tobacco promotion and smoking, rather than evidence of an association.

The following part of this chapter describes the methods and results of the meta-analysis of studies with children and adolescents, before drawing overall conclusions based on both parts of this project.

## Part B – Meta-analysis

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### Methods

#### *Literature search strategy*

Literature searches were similar, though not identical, to those used in the systematic review and were conducted by LR in June 2014 using Medline (OvidSP), Scopus, and Web of Science. An initial search for the keywords “tobacco” OR “smoking” OR “cigarette\*” was conducted. A separate search was then conducted for the following terms, using the OR command between each keyword (“point-of-sale”, “point of sale”, “POS”, “point-of-purchase”, “point of purchase”, “POP”, “powerwall”, “retail” OR “store”). Lastly a search was conducted with the following keywords (“youth”, “adolescent”, “teen\*”, OR “child\*”). These three searches were each combined using the AND command (e.g. #1 AND #2 AND #3). The titles and abstracts of retrieved articles were reviewed by LR and references discarded if they were not related to tobacco control. The abstracts of the remaining references were reviewed by LR to identify whether articles were relevant and met the inclusion criteria below. The full text of each article was obtained where further clarification on the measures and study objective was needed. Further searches were conducted using the reference lists and ‘cited by’ lists of retrieved articles and through ‘related article’ searches on Google Scholar. The 2014 online editions of Tobacco Control and Nicotine & Tobacco Research were scanned for relevant articles. Searches were conducted by LR. Both LR and a biostatistician, Claire Cameron (CC), independently reviewed the articles for eligibility and inclusion.

#### *Inclusion criteria*

Quantitative research published in a peer-reviewed journal between 1 January 1990 and 23 June 2014 was included. Research was eligible if it included either self-reported or objective measures of exposure to POS tobacco promotion (e.g. awareness of POS promotion, visits to stores where POS promotion was present, or assessments of POS tobacco promotions within a specified study area). Cigarette brand awareness was included as a proxy measure for exposure to POS tobacco promotion only if it specifically related to the identification of brands in a retail setting. The inclusion



criteria for outcome measures were individual-level smoking behaviour (experimentation, smoking initiation, regular smoking and cigarette purchasing behaviour) and smoking-related cognitions (e.g. smoking susceptibility, cravings to smoke, perceived likelihood of future smoking, perception of peer smoking prevalence). Studies were eligible if the samples included children and adolescents aged 18 years old or younger. Only observational studies were included. Experimental research was excluded to assess naturalistic exposure to POS tobacco promotions rather than the simulated exposures used in most experimental research.

Several potentially relevant articles identified during the literature search process did not meet inclusion criteria, including a study with a college student sample (Shadel et al., 2013), studies using an exposure measure that included but was not specific to POS marketing (MacFadyen, Hastings, & MacKintosh, 2001; Weiss et al., 2006), studies assessing the relationship between smoking and exposure to tobacco advertising in general (Hanewinkel et al., 2011), and studies investigating access to tobacco retailers and smoking (Adams et al., 2013; Johns et al., 2013).

### ***Data extraction***

A data collection form (Egger & Davey Smith, 2001) (Appendix 1) was developed and piloted by LR and CC. Extracted data comprised: study authors, publication year, data collection year, study design (cross-sectional versus cohort), country, exposure and outcome measures, participant age group, sample size, OR and 95% confidence intervals, and whether the OR was adjusted or not. LR and CC independently extracted the required data from each article; these were subsequently compared for accuracy, and any discrepancies were resolved by discussion between LR and CC. For studies with multiple exposure measures, we prioritised more objective measures (e.g. store-visiting frequency) over subjective measures (e.g. attraction to POS displays), selecting these ORs for the meta-analysis. Where multiple outcome measures were reported in a single article, we prioritised smoking status (i.e. being a current smoker or ever-smoker) over other behavioural variables (e.g. cigarettes per day, purchasing-related measures), and we prioritised smoking susceptibility amongst never-smokers over other cognitive variables. Where ORs were not reported, we calculated an unadjusted

OR using the descriptive data provided in the article. Where an article provided multiple ORs for data collected at more than one time-point, we decided *a priori* to use data for the most recent year. The exception to this was the cohort study that provided ORs at both 12-month and 30-month follow-up (Henriksen et al., 2010) we decided that the 12-month OR should be used as this estimate would be most comparable to those in the remainder of the research (since these were mostly cross-sectional studies, along with one other 12-month cohort study). Where an article provided multiple ORs due to the use of categorical exposure data (e.g. Paynter et al., 2009), these were combined into a single overall estimate by running a meta-analysis on the ORs and confidence intervals presented. We called this a “within-paper” meta-analysis and it provided a single estimate for that particular analysis. Where an article provided multiple ORs in stratified analyses, such as by geographic area or age group, these were combined to provide a single OR for the overall study. Where an article provided multiple ORs in statistical models that adjusted for different covariates, we selected the OR that had been adjusted for the greatest number of variables. Each study was scored according to the POS tobacco promotion context (i.e., studies conducted in environments where only POS tobacco displays were permitted at the time of data collection were scored a “0”; those in environments that permitted retail tobacco promotions in addition to tobacco displays were scored a “1”). This information was ascertained by LR, either through prior knowledge (in the case of the U.S., UK and NZ), through information provided in the article, or by contacting the study author.

### ***Quality assessment***

A quality score was assigned to each article as a way of assessing risk of bias; we used the Newcastle-Ottawa Quality Assessment Scale (NOQAS; Wells et al., 2000) for cohort studies, and a modified version for cross-sectional studies (see Appendix 2). Studies were awarded a maximum of two points if they controlled for the most important potential confounding factors; we deemed these to be SES and smoking by family members AND peers, since we theorised that these factors would be most likely to be associated with both the exposure and outcome. We also allowed a score of 0.5 to be given for exposure measures assessed via written self-report but that were objective (e.g. store-visiting frequency) compared to the self-reported exposure measures we

considered much more subjective (e.g. noticing tobacco displays). This approach differentiated quality within the studies insofar as the measurement of exposure was concerned, since all studies used written self-report as means of assessing exposure. The overall scores for cohort and cross-sectional studies were adjusted to give each study a total score out of 10. LR assigned quality scores to each study; these were then reviewed and corroborated by RM.

### *Statistical analyses*

Random effects meta-analyses were performed. A random effects model is the most appropriate model to use with meta-analyses of observational studies, as it assumes the studies are each estimating their own effect rather than a 'true' effect that a fixed effects model would assume (and that may be more applicable to RCTs). Separate analyses were performed for the behavioural (11 studies) and the cognitive outcomes (6 studies). We conducted a subgroup analysis for the two tobacco POS advertising environments for each of those two study types. Sensitivity was examined through analysing the studies according to quality (5 or below compared to more than 5 out of 10) and study size (up to 10,000 participants, more than 10,000). Meta-regression was used to determine any significant differences between the subgroups (quality and study size). Funnel plots were created to investigate the possibility of publication bias. Statistical analyses were performed using Stata Version 13 (using metan and metareg commands) (StataCorp, 2013).

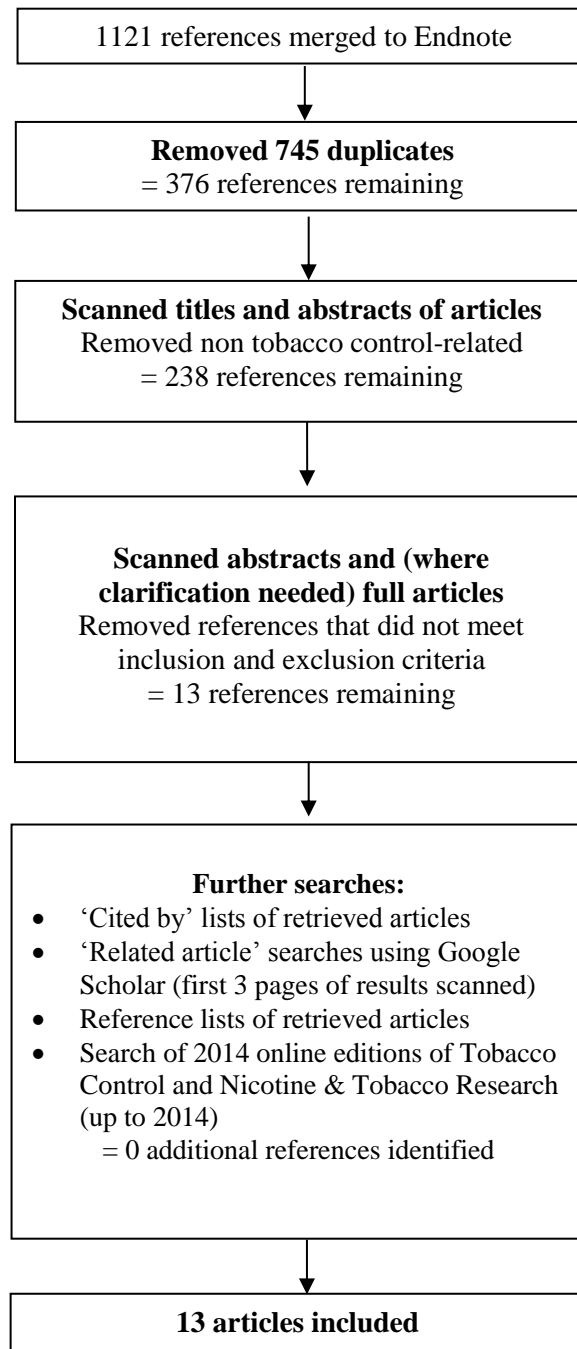
## **Results**

### *Results of literature search*

The initial literature searches yielded 1121 potential articles (see Figure 6). Of these, 13 were judged to have met the inclusion criteria and were reviewed in full. These included five of the ten studies on children and youth included by Paynter & Edwards (2009), six of the nine studies included in the systematic review described in Part A of this chapter (Robertson et al., 2014), and an additional two studies subsequent to the search dates in the reviews (see Appendix 3). Eleven articles reported associations for behavioural outcomes (Table 9), and six for cognitive outcomes (Table 10); four studies reported both behavioural and cognitive outcomes. Of the studies assessing

behavioural outcomes, seven examined ever-smoking, whereas four used being a current smoker as an outcome. Of the studies assessing cognitive outcomes, all examined smoking susceptibility, though five used a sample of never-smokers, while one used non-smokers (hereafter the cognitive outcomes are referred to as “smoking susceptibility”). All studies except two (Kim, Loomis et al., 2013; Slater, Chaloupka, Wakefield, Johnston, & O’Malley, 2007) used self-reported exposure measures, though seven used a more objective self-report question (i.e. store-visiting frequency). Eight studies were conducted in the U.S., three in Europe, one in NZ, and one in Japan. Two were cohort studies and the remainder were cross-sectional.

Figure 6. Process of identifying references for meta-analysis



**Table 9. Studies examining association between POS tobacco promotion and behavioural smoking outcomes amongst children and adolescents**

Author	Year published	Year data collected	Country	Study design	Average age of sample (yrs)	Sample size	Exposure	Outcome	Adjustments	POS context score	NOQAS score (10 max)	Odds ratio (95% confidence interval)
(Braverman & Aarø)	2004	1995	Norway	Cross-sectional	13-15	4,065	Self-reported recent exposure to retail tobacco promotion	Smoking status (daily, occasional, non-smoker)	SES; ethnicity; gender; smoking by family; smoking by friends	0	2	2.07 (1.73 - 2.49)
(Dauphinee et al.)	2013	2006	US	Cohort; 12-mnth	11-15	1,179	Self-reported store-visiting frequency	Ever-smoking (vs never-smoking)	Gender; ethnicity; school year; survey year; school performance; unsupervised days after school; risk-taking propensity; smoker at home; friend who smokes	1	7	1.15 (1.04 - 1.27)
(Feighery et al.)	2006	2003	US	Cross-sectional	11-14	2,063	Self-reported store-visiting frequency	Ever smoking (vs never-smoking)	SES; ethnicity; gender; smoking by family; smoking by friends; unsupervised time	1	5	2.01 (1.54 - 2.62)
(Henriksen, Feighery, Wang, & Fortmann)	2004	2003	US	Cross-sectional	11-14	2,125	Self-reported store-visiting frequency	Ever smoking (vs never-smoking)	SES; ethnicity; gender; smoking by family; smoking by friends; exposure to other tobacco marketing	1	5	1.50 (1.10 - 2.10)
(Henriksen et al.)	2010	2003	US	Cohort; 12-mnth	11-14	1,182	Self-reported store-visiting frequency	Transition from never-smoking to ever-smoking	School year; gender; ethnicity; racial minority; academic performance; being unsupervised after school; risk-taking propensity; parent smoking; sibling smoking; exposure to smoking on TV/movies; perceived exposure to retail tobacco advertising	1	7	2.06 (1.32 - 3.21)
(Kim, Loomis et al.)	2013	2004-08	US	Cross-sectional	9-17	46,894	Mean no. of cigarette adverts per store at county-level	Current smoker	Age; ethnicity; gender; student income; school smoking prevalence; living with smoker; county of residence; year of survey	1	8	0.96 (0.84 - 1.10)
(Paynter et al.)	2009	2007	New Zealand	Cross-sectional	14-15	27,757	Self-reported store-visiting frequency	Current smoker	Age; gender; ethnicity; peer smoking; parental smoking; smoking in the home; school SES	0	7	1.73 (1.19 - 2.50)
(Schooler, Feighery, & Flora)	1996	1994	US	Cross-sectional	13	571	Self-reported frequency of noticing retail tobacco promotion	Ever smoking	n/a	1	2	2.98 (2.01 - 4.41)
(Slater et al.)	2007	2003	US	Cross-sectional	14-18	26,301	Observational assessments of tobacco promotion in stores	Transition from never-smoker to "puffer"	School grade, gender, ethnicity; resides with both parents; student income; parental education; urbanisation; state-level tobacco control policies; year of data collection	1	6	1.08 (1.02 - 1.14)
(Spanopoulos et al.)	2013	2011	UK	Cross-sectional	11-15	5,376	Self-reported store-visiting frequency	Ever smoking (vs never-smoking)	Gender; ethnicity; school year; academic performance; rebelliousness; parent smoking; sibling smoking; perceived peer smoking prevalence; SES	0	7	1.64 (1.14 - 2.34)
(Watanabe et al.)	2013	2008-09	Japan	Cross-sectional	15-18	540	Self-reported store-visiting frequency	Current smoker	Parental smoking	1	2	6.73 (2.00 - 22.60)

Table 10. Studies examining association between POS tobacco promotion and smoking susceptibility amongst children and adolescents

Author	Year published	Year data collected	Country	Study design	Average age of sample (yrs)	Sample size	Exposure	Outcome	Adjustments	POS context score	NOQAS score (10 max)	Odds ratio (95% confidence interval)
(Dube, Arrazola, Lee, Engstrom, & Malarcher)	2013	2011	US	Cross-sectional	11-18	3,043	Self-reported exposure to retail tobacco promotion	Smoking susceptibility among never-smokers	School grade, sex, ethnicity, exposure to peer smoking, exposure to smoking at home	1	4	1.35 (0.88 – 2.07)
(Feighery et al.)	2006	2003	US	Cross-sectional	11-14	1,642	Self-reported store-visiting frequency	Smoking susceptibility among never-smokers	SES; ethnicity; gender; smoking by family; smoking by friends; unsupervised time	1	5	1.25 (0.98 – 1.61)
(Kim, Loomis et al.)	2013	2004-08	US	Cross-sectional	9-17	42,138	Mean no. of cigarette adverts per store at county-level	Smoking susceptibility among non-smokers	Age; ethnicity; gender; student income; school smoking prevalence; living with smoker; county of residence; year of survey	1	7	1.03 (0.89 – 1.20)
(MacKintosh et al.)	2012	2008	UK	Cross-sectional	11-16	905	Self-reported frequency of noticing retail tobacco promotion	Smoking susceptibility among never-smokers	Age; gender; SES; sibling smoking; close friend smoking; parent smoking; attraction to PoS displays	0	6	1.77 (1.15 – 2.73)
(Paynter et al.)	2009	2007	New Zealand	Cross-sectional	14-15	15,071	Self-reported store-visiting frequency	Smoking susceptibility among never-smokers	Age; gender; ethnicity; peer smoking; parental smoking; smoking in the home; school SES	0	7	1.68 (1.37 – 2.06)
(Spanopoulos et al.)	2013	2011	UK	Cross-sectional	11-15	1,204	Self-reported store-visiting frequency	Smoking susceptibility among never-smokers	Gender; ethnicity; school year; academic performance; rebelliousness; parent smoking; sibling smoking; perceived peer smoking prevalence; SES	0	7	1.20 (0.91 – 1.58)

### *Results of meta-analysis*

As shown in Figure 7, for the 11 studies examining behavioural outcomes, the pooled OR was 1.61 (95% confidence interval (CI): 1.33- 1.96). For studies examining smoking susceptibility the pooled OR was 1.32 (95% CI: 1.09 – 1.61) (Figure 8). Overall, there was significant heterogeneity between the studies, both in the behavioural outcome subset ( $I^2$  91.3%,  $p < 0.001$ ) and the smoking susceptibility subset ( $I^2$  70.7%,  $p = 0.005$ ).

Sub-group analyses suggested a higher OR in “restricted POS environment” study jurisdictions, where the only form of POS tobacco promotion was the tobacco display. For behavioural outcomes, the OR in “restricted POS environment” jurisdictions was 1.93 (95% CI: 1.66 – 2.24) compared to 1.50 (95% CI: 1.23 – 1.83) for the remaining studies. Similarly for smoking susceptibility, the OR in “restricted POS environment” jurisdictions was 1.51 (95% CI: 1.18 – 1.92) compared to 1.13 (95% CI: 0.97 – 1.32) for the remaining studies. However, meta-regression indicated that the difference in ORs between the two POS promotion environments was not statistically significant for either behavioural or smoking susceptibility studies.

Sensitivity analyses were performed by, (i) comparing large studies (10,000 participants or more) with smaller studies (less than 10,000) and, (ii) comparing studies that scored low on quality (5 out of 10 or below) with those that scored more highly (more than 5). Meta-regression showed that there was no difference in the effects for the study size in either the behavioural or the smoking susceptibility group of studies. There was some indication ( $p = 0.03$ ) that the OR for higher quality studies was significantly lower than that for the lower quality studies in the behavioural group of studies: the OR for studies with a quality score of 5 or below was 2.14 (95% CI: 1.68 – 2.74) compared to 1.22 (95% CI: 1.06, 1.40). There was no evidence of a similar difference in the smoking susceptibility studies. The funnel plots were asymmetrical for both the behavioural studies (Appendix 4) and smoking susceptibility studies (Appendix 5). This is consistent with the presence of publication bias, although there are several possible explanations for asymmetry in a funnel plot, including heterogeneity in the study data.



Figure 7. Forest plot of studies examining association between exposure to POS tobacco promotion and behavioural smoking outcomes

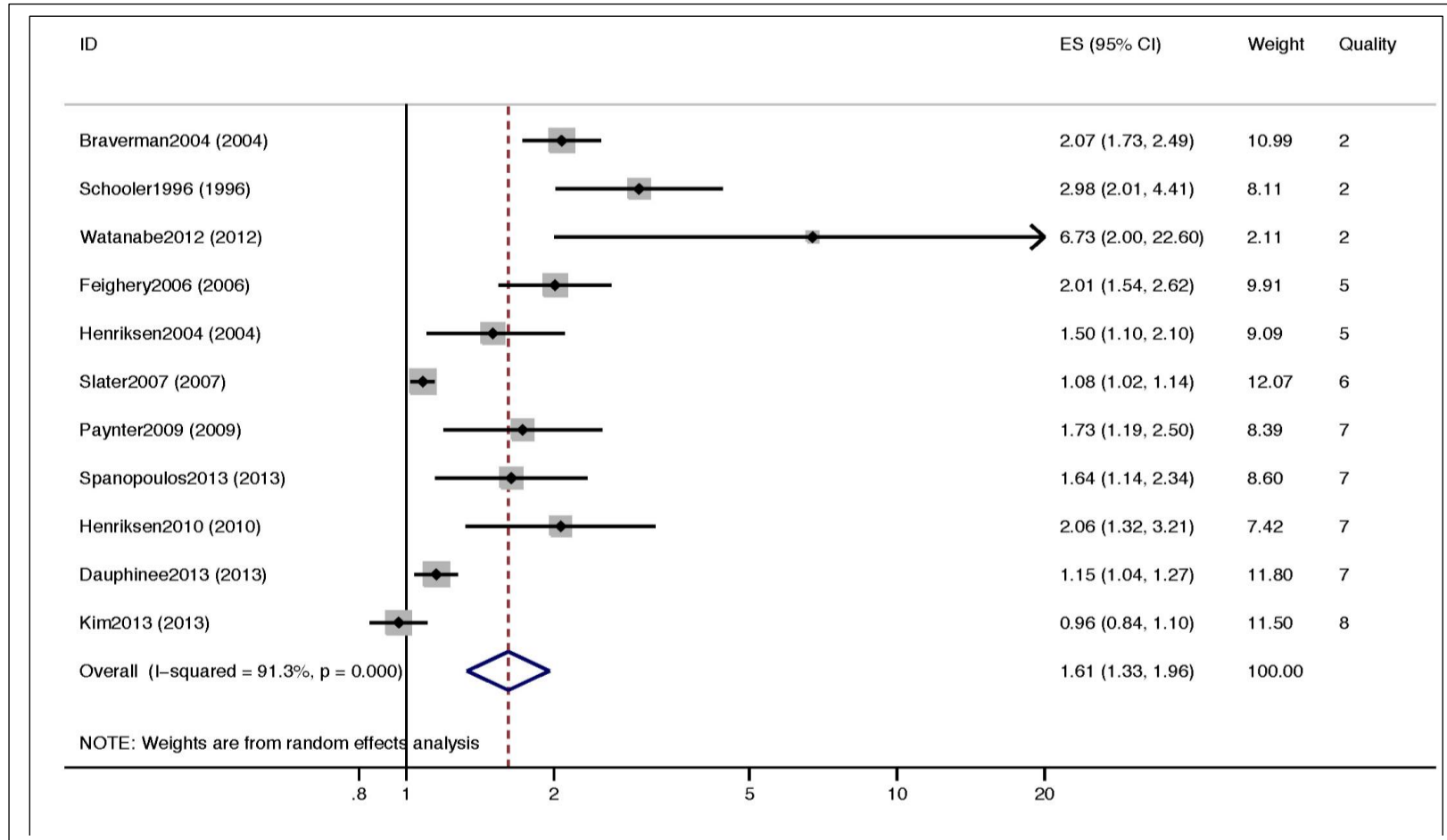
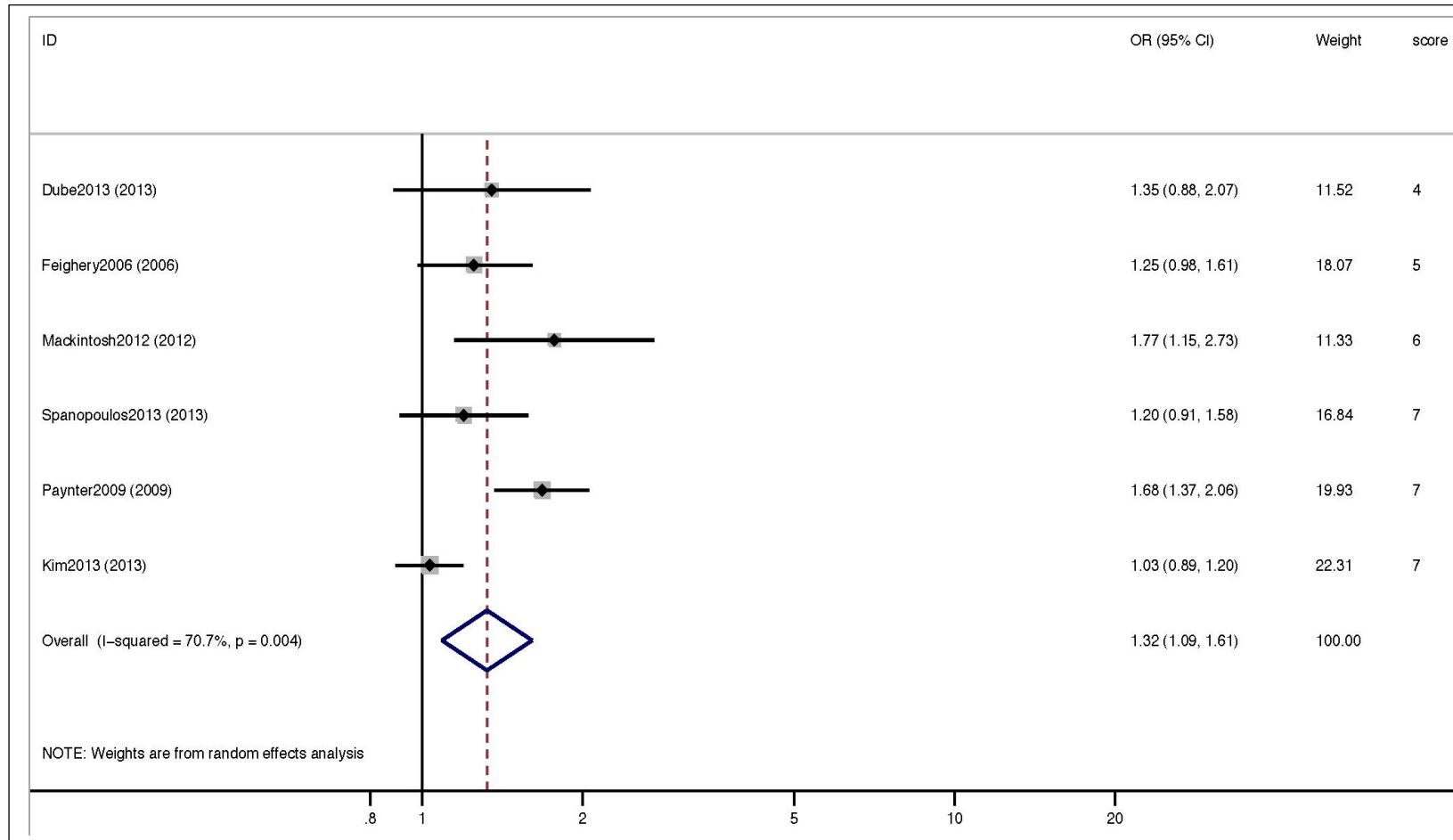


Figure 8. Forest plot of studies examining association between exposure to POS tobacco promotion and smoking susceptibility



## Discussion

The results of this meta-analysis indicate that the odds of having tried smoking are around 1.6 times higher for children and young people who are frequently exposed to POS tobacco promotion, compared to those who are less frequently exposed. Similarly, the odds of being susceptible to future smoking amongst never-smokers are approximately 1.3 times higher for children and young people frequently exposed to POS tobacco promotion, compared to those less frequently exposed.

In each study, the reported ORs were consistent in their direction. The exception was the study by Kim, Loomis et al. (2013) which used an ecological design, where the exposure measure was county-level estimates of POS tobacco advertising and promotions, rather than individual-level exposure. As discussed in Part A, this approach may have masked individual variation in actual exposures, which, if non-differential, would have biased the results towards the null, and may account for the non-statistically significant ORs. This explanation may also apply to Slater et al.'s (2007) study, which also used a population-level exposure measure that could plausibly have contributed to an effect size lower than those reported in the other studies. While the higher quality studies show a smaller effect size for the studies using behavioural outcomes, the OR (1.22, 95% CI: 1.06, 1.40) was in the same direction as the overall pooled OR, and is consistent with the inference that exposure to POS tobacco promotion is associated with higher odds of being a smoker or of having tried smoking.

Subgroup analyses indicated that there was no statistically significant difference in the effect size between jurisdictions where the only form of retail tobacco promotion is the tobacco product display and those that allowed more extensive POS tobacco promotions. This finding implies that any type of in-store tobacco advertising - whether signage, posters or the product display - is associated with increased odds of smoking and smoking susceptibility. To be effective, bans on POS tobacco promotion should therefore cover both in-store advertising, such as brand or price promotions, as well as the display unit featuring cigarette packs.

As discussed in Part A, the tobacco industry has previously criticised research on POS advertising for supposedly showing “small” effect sizes (Basham, 2010). Yet the overall pooled ORs in this meta-analysis are comparable in size to those of other well-accepted risk factors for youth smoking. These include having a parent who smokes (OR 1.72) (Leonardi-Bee, Jere, & Britton, 2011) and exposure to pro-tobacco marketing and media in general (ORs 1.51 to 2.23) (Wellman, Sugarman, DiFranza, & Winickoff, 2006). Furthermore, this industry criticism overlooks the important point that at a population-level - and particularly at a global-level - small to moderate effect sizes accumulate to produce highly meaningful outcomes.

The main limitation to this meta-analysis is that, with the exception of two cohort studies (Dauphinee et al., 2013; Henriksen et al., 2010), the studies included were cross-sectional, thus limiting a causal inference. However, as noted previously, the use of the smoking susceptibility outcome in cross-sectional studies provides greater confidence about the causal influence of POS tobacco promotion on smoking risk, compared to current smoking or ever-smoking. Being a current smoker, or ever-smoker can plausibly cause more store visits or greater awareness of POS tobacco promotion, therefore any observed associations can theoretically be explained by reverse causality. Evidence of an association between POS promotions and smoking susceptibility among never-smokers is compelling because these individuals are not smoking, which means tobacco purchasing is highly unlikely to be a cause of greater exposure to POS tobacco promotion. The relationship can plausibly only run in one direction and thus supports the conclusion that exposure to POS tobacco promotions fosters smoking susceptibility.

There is a possibility that the associations observed in the studies are confounded by some uncontrolled variable. For example, it is theoretically possible that young people who frequently visit stores selling tobacco differ in some way that predisposes them to initiate smoking. We also note there is some evidence that publication bias may be present in the studies included in this meta-analysis, as indicated by the asymmetry in the funnel plots. If publication bias was present, it may have resulted in an

overestimation of the pooled effect size. However, we cannot conclude this bias is present with certainty, as heterogeneity in the data is one of several other possible explanations for the asymmetry observed.

## Conclusions

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The available research consistently demonstrates a positive association between exposure to POS tobacco promotion and smoking. The evidence supporting a causal association has increased since the first review in 2009, with several studies having demonstrated findings consistent with a dose-response relationship, a temporal sequence between exposure and outcome, a high level of consistency of results across different study methodologies, locations and the use of different measures, and some evidence of reversibility of the association. For adult smokers, tobacco product displays and other forms of POS promotion appear to cue cravings, trigger impulse purchases and undermine attempts to quit. However, more research is needed with adult smokers to strengthen these inferences. For children and young people, the evidence base linking POS tobacco promotion to smoking and smoking susceptibility is more established than that for adult smokers. Children and adolescents more frequently exposed to POS tobacco promotion have around 1.6 times higher odds of having tried smoking and around 1.3 times higher odds of being susceptible to future smoking, compared to those less frequently exposed.

New Zealand's ban on tobacco displays at the POS came into effect in July 2012, and the findings of this review and meta-analysis strongly suggest that this measure will contribute to reducing smoking prevalence. As yet, there are no published studies evaluating NZ's POS display ban. However, one study that is in progress indicates that the positive association between store-visiting frequency and experimental smoking has decreased from an AOR of 2.66 (95% CI: 2.22 – 3.18) in 2007, to 1.68 (1.50 – 1.89) in 2013 (i.e. after the display ban came into effect) (Edwards, Ajmal, Healey, & Hoek, in press). Associations for smoking initiation and frequency of attempted tobacco purchase also attenuated post-implementation of the display ban (Edwards et al., in press). It is not possible to ascertain whether the apparent positive effects are due to the removal of POS tobacco displays, or other provisions in the legislation (e.g. stronger enforcement penalties for sales to minors). However, evaluation studies suggest tobacco display bans may reduce youth smoking susceptibility, help denormalise smoking, and potentially reduce youth smoking behaviour (Dunlop et al., 2015; McNeill

et al., 2010; Shang, Huang, Cheng, Li, & Chaloupka, 2016), and this evidence suggests that removing tobacco from open display in retail outlets may help NZ's progress towards the 2025 goal.

The findings of this review and meta-analysis are important for jurisdictions without a POS tobacco promotion ban, because children and young people's exposure to POS tobacco promotion is likely to be almost universal in those places, given the widespread availability and promotion of tobacco (Henriksen, 2012). A recent modelling study suggests that banning POS tobacco promotion in the U.S. would reduce smoking prevalence by approximately 16% by the year 2065, thus preventing around 630,000 smoking attributable deaths, 215,000 low birth weight infants, 140,000 pre-term births and 1900 infant SIDs-related deaths in the U.S. (Levy et al., 2015). This project provides evidence that supports continuation of POS tobacco display bans in those jurisdictions where such legislation has been introduced, and it should encourage similar policies in jurisdictions still to implement a POS display ban.

The remainder of this thesis explores stakeholders' perceptions to further measures that could regulate the tobacco retail environment in NZ. In particular, stakeholders' views on likely benefits, effectiveness, acceptability and challenges will be explored, as this knowledge may help to shape the NZ tobacco control sector's advocacy efforts.

## **Chapter 4 – A qualitative analysis of NZ tobacco control experts' views**



## Introduction

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As discussed in the first two chapters of this thesis, tobacco control advocates have made many arguments to reduce tobacco availability, both overseas (Ackerman et al., 2016; Chapman & Freeman, 2009; Lipperman-Kreda, 2016; Tilson, 2011; Tilson et al., 2013) and in NZ (Cancer Society Auckland Health Promotion Team, 2013; Jaine, Russell, Edwards, & Thomson, 2014; Marsh et al., 2013; National Smokefree Working Group, 2015a; Perrin, 2014; Wilson et al., 2016). Recent research in NZ has examined how tobacco control key informants (i.e. politicians, managers of smoking cessation and tobacco-related organisations, researchers and advocates) view substantial reductions in the retail availability of tobacco, amongst other 'endgame' policy ideas (Ball, Waa, Tautolo, & Edwards, 2016). In this qualitative study, several participants supported substantially reducing tobacco retail availability and believed it could be an important equity measure; however, others doubted the effectiveness and feasibility of this policy. More generally, several different strategies could reduce tobacco availability (Robertson et al., 2016; Smyth et al., 2015), and Ball, Waa et al. (2016) did not examine participants' views on different policies that could reduce tobacco availability. Therefore in NZ, there remains a lack of research exploring the sector's perceptions of different tobacco retail policies, or identifying the policies seen as most effective. The NSFVG has identified restricting tobacco supply as one of thirteen priorities for achieving the 2025 goal (National Smokefree Working Group, 2015b). The NSFVG also states that licensing of tobacco retailers may be one way to restrict tobacco supply, but suggests a wider range of policy options needs to be defined and prioritised (National Smokefree Working Group, 2015b).

The study presented in this chapter aimed to conduct an in-depth analysis of NZ tobacco control experts' views towards policy options that would regulate the tobacco retail environment. Identifying the preferred policy model among NZ experts may support tobacco control work and refine advocacy efforts in this area. The key groups involved in tobacco control activities and advocacy in NZ include NGOs such as the Cancer Society of New Zealand, smoking cessation service providers, Māori health organisations such as Te Ha Ora, Pacific health organisations such as Tala Pasifika,

Government agencies such as the Health Promotion Agency, Ministry of Health, District Health Boards and Public Health Units, and individuals working in clinical roles or academia. Many of these organisations or sectors are members of NZ's Smokefree Coalition and/ or the National Smokefree Working Group, which collectively represent NZ's tobacco control sector. The research questions were: i) how important do tobacco control experts consider tobacco retail policies to be in achieving the 2025 goal; ii) which retail policies do they consider most likely to be effective in achieving the 2025 goal; and iii) what effect do experts believe these policy changes will have, and iv) what are the barriers and facilitators to achieving these policy changes?

## Method

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### Sample

A purposeful sampling strategy was used to select individuals who would be “information-rich” about the area of tobacco retail regulation (Patton, 2002). The sampling approach was predominantly “criterion sampling” (Patton, 2002). A list of possible participants was initially identified; these were individuals judged by the research team (i.e. the candidate and supervisors) to have been influential in the tobacco sector for a minimum of one year, or whose organisation was actively involved in the tobacco control sector. Snowball sampling was also carried out when participants made suggestions about further individuals to contact. In total, thirty-eight individuals were approached and invited to take part in the study. These included representatives from a range of NGOs and organisations associated with tobacco control, a university researcher (not affiliated with the authors), former politicians, and representatives from government organisations (i.e. Ministry of Health, the NZ Health Promotion Agency, and District Health Boards), and Smokefree Enforcement Officers (SEOs) from throughout NZ.

### Qualitative approach

The approach used in this research was qualitative description, a highly pragmatic qualitative research method with an emphasis on obtaining information for practical application (Neergaard, Olesen, Andersen, & Sondergaard, 2009). The purpose of qualitative description is to provide “a rich, straight description” of the data, as opposed to a highly interpretive meaning of an experience, or theory development. Qualitative description uses generic qualitative methods, such as interviews, reflection on the interviews, coding data into themes and analysis (Caelli, Ray, & Mill, 2003). A semi-structured interview was used, whereby the discussion topics were specified in advance, though flexibility in wording and sequencing of questions was retained by the researcher to ensure the interview remained natural and conversational (Patton, 2002).

The interview guide comprised general introductory questions about the 2025 goal and probed participants' perceptions of the priority areas for tobacco control in NZ (Appendix 6). Participants were asked about the changes they would make to the way in which tobacco was sold in NZ (aside from a total ban on tobacco), the likely impact of these changes, and potential barriers to their introduction. Following these questions, the interviewer explored participants' views on potential tobacco retail interventions (e.g. registration or licensing of tobacco retailers, restrictions on the number, outlet type or location of tobacco retailers, and other potential policies, such as requiring tobacco retailers to stock nicotine replacement therapy).

### **Procedure**

Participants were initially contacted by telephone by LR to explain the study, and were subsequently emailed the information sheet (Appendix 7). Once participants had read the information sheet, and agreed to participate, a suitable time for an interview was arranged. Interviews took place by telephone and - with permission - each interview was audio recorded and subsequently transcribed. Data collection was conducted between May and December 2014 by LR. Interviews continued until the point of saturation, when no new themes emerged.

### **Analysis**

Data analysis was carried out by LR and began whilst interviews were being carried out. LR checked the interview transcripts for accuracy against audio files, and qualitative content analysis was undertaken using transcripts as the data source. The focus of qualitative content analysis is on summarising the informational content of the data (Morgan, 1993). Data were predominantly analysed in a deductive manner using the interview guide as a framework, although inductive analysis was also used to identify patterns within the data themselves (Patton, 2002). After coding all the interview transcripts, the data were sorted to identify themes. Commonalities and differences among the data were identified and extracted for further consideration. A supervisor (LM) coded three randomly selected interviews. The initial themes were compared between LR and LM who both subsequently reviewed and finalised themes through discussion.

## Results

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### Participants

Of the 38 individuals invited to participate, 25 took part in a research interview. Characteristics of the participants are shown in Table 11. In order to maintain anonymity as far as possible, the demographic characteristics are not presented in the table. Two participants were under 30 years old; ten were 30 to 45 years old; eight were 46 to 59 years old, and five were 60 years or above. Four participants identified as Māori, two as Pacific people, and the remaining identified as either NZ European or other European. Nine participants were male; 16 were female. All were currently smokefree, and eight identified as a former smoker.

Of the thirteen individuals who were invited to participate but did not take part: no contact was achieved with two former politicians; two individuals working for government organisations reported that they were unable to take part due to constraints of their role (i.e. having to maintain political neutrality); eight individuals working for government organisations did not respond to repeated attempts to contact them; and one representative of a health NGO agreed to take part although it was not possible to set up an interview time within the data collection period. Interviews lasted a mean duration of 29 minutes (range 15 minutes to 70 minutes).

**Table 11. Participant characteristics**

<b>ID</b>	<b>Type of organisation</b>	<b>Participant's role</b>	<b>Length of time in tobacco control</b>
TCE1	Health NGO	Programme Manager	7 years
TCE 2	Health Service Provider	Chief Executive Officer	6 years
TCE 3	Health Organisation	Executive Director	5 years
TCE 4	Health NGO	Clinical Director	2 years
TCE 5	Health NGO	Manager	8 years
TCE 6	University	Research Professor	> 20 years
TCE 7	Voluntary Association	Chief Executive Officer	15 years
TCE 8	Health NGO	Manager	4 years
TCE 9	University	Research Professor	10 years
TCE 10	Health NGO	Strategic Advisor	1 year (30 years in public health)
TCE 11	District Health Board	Smokefree Coordinator	10 years
TCE 12	Public Health Unit (DHB)	Team Leader	6 years
TCE 13	District Health Board	Smokefree Enforcement Officer	2.5 years
TCE 14	Public Health Unit (DHB)	Smokefree Enforcement Officer	2 years
TCE 15	Public Health Unit (DHB)	Smokefree Enforcement Officer	1.5 years
TCE 16	Public Health Unit (DHB)	Smokefree Enforcement Officer	4 years
TCE 17	District Health Board	Smokefree Enforcement Officer	10 years
TCE 18	Public Health Unit	Smokefree Enforcement / Liquor Licensing Officer	7 years
TCE19	Public Health Unit	Smokefree Enforcement / Liquor Licensing Officer	4 years
TCE20	Public Health Unit	Smokefree Enforcement / Health Protection Officer	3 years
TCE21	Public Health Unit (DHB)	Smokefree Enforcement Officer	2 years
TCE22	Public Health Unit (DHB)	Smokefree Enforcement Officer	16 years
TCE23	Public Health Unit (DHB)	Smokefree Enforcement Officer	4 years
TCE24	Public Health Unit	Smokefree Enforcement Officer	1.5 years
TCE25	Public Health Unit	Health Promotion Advisor	7 years

## **Interviews**

The results of the interviews are structured as follows. The first section explores participants' perceptions of the interventions required to achieve the 2025 goal, and the importance of tobacco retail policies within that context. The second section explores participants' views of specific tobacco retail policies in more detail. These

include registration and licensing of tobacco retailers, requiring tobacco retailers to stock nicotine replacement products, and policies to reduce outlet density such as a 'sinking lid' approach, restricting tobacco sales at certain outlets, zoning approaches, and only allowing tobacco sales at R18 stores or pharmacies. The third section reports participants' perceptions of the challenges, barriers, and possible facilitators, in relation to achieving policy adoption.

### *Importance of tobacco retail interventions in achieving 2025*

Participants expressed a consistent definition of what "smokefree 2025" meant to them, with each of them viewing the goal as a reduction in smoking prevalence to 5% or less across all population groups, and tobacco being very difficult to obtain. Participants were asked what they considered necessary to achieve 2025; they called for a combination of different interventions. Almost all reported that continued tobacco tax increases (i.e. beyond 2016) was the priority, and several suggested the need to increase tax increases beyond 10%, or to add "surprise" increases into the regime. Other commonly cited interventions included funding for smoking cessation services, mass media campaigns to support quitting and discourage smoking uptake, extending smokefree environments (such as bans on smoking in public parks and in vehicles), and plain (standardised) packaging legislation. Two additional policy ideas that were put forward, though were not commonly discussed, were the denicotinisation of tobacco products, and encouraging the use of electronic nicotine delivery systems to support cessation.

When discussing the combination of interventions needed to achieve 2025, several participants cited the importance of restricting the retail availability of tobacco:

*"I think it's really important to make selling and distributing tobacco across the nation as inconvenient as possible. That is priority number one." (TCE3)*

*"We need to think about making it harder for people to purchase tobacco and that may be both in terms of the price and also the availability... in terms of availability [it] would be considering some way of restricting the number of retail outlets, or people who can access those retail outlets."*

*(TCE9)*

Even participants who did not spontaneously discuss retail interventions, believed these were very important to the 2025 goal. Reducing the availability of tobacco was seen primarily as a way to reduce its consumption by making it more difficult to obtain. The lack of tobacco retailing regulation was seen as illogical, given the harmfulness of the product:

*"...It's absolutely nonsensical that anyone can sell tobacco in New Zealand with absolutely no restriction at all other than the ban on selling cigarettes to under 18s." (TCE4)*

Participants who were Smokefree Enforcement Officers called for more regulation of tobacco retailers because of concern over tobacco sales to minors, which they said occurred mainly at dairies (i.e., small independent convenience stores):

*"...every time we do a Controlled Purchase Operation, we'll do 20 or 30 visits, we'll get three or four sales out of that. So... we're looking at probably 10% to 20% of CPOs result in sales." (TCE12)*

*"...at the moment, I mean, the dairy's probably the high risk place anyway...that's where most of the kids are buying the product." (TCE13)*

However, two participants did not support advocating for retail interventions as a priority; they believed promoting this area could detract attention from other policy campaigns, such as plain packaging:

*"...it is important, but it's not top of the agenda for me... I think it could be a bit of a distraction and I think we should put all of our efforts at the present time into standardising packaging... I don't doubt the importance of a retail licence but it's going to take energy, commitment and work from the NGO sector and also the Ministry of Health and that will detract, in my view, from other key issues." (TCE6)*



Overall, participants tended to consider tobacco retail interventions to be one part of the policy programme required to achieve the 2025 goal; however, several thought other interventions, such as taxation and plain packaging, should have a higher priority.

### *Participants' views of specific tobacco retail policies*

After discussing the importance of tobacco retail strategies in general terms, the interviews then explored selected tobacco retail policies in more detail. Participants were first asked what changes - if any - they would make to the way in which tobacco was sold in New Zealand. Invariably, their responses combined short-term interventions, such as licensing or registration of tobacco retailers, followed by progressive reductions in the retail availability of tobacco, ultimately reducing tobacco availability to a minimal number of outlets. The interviews first explored the short-term interventions of registration and licensing for tobacco retailers.

#### *Registration of tobacco retailers*

Those who proposed a registration system for tobacco retailers were asked to describe what that would involve. Some understood registration as a scheme providing information about tobacco retailers to authorities. Participants holding this view had mixed feelings about registration, though some saw it as a useful initial step that could help communication between the government and retailers, and enhance monitoring and enforcement of retail-level legislation:

*"...It helps paint a picture, it helps to monitor things a bit better... So I do think that's helpful, I do think it's a step in the right direction." (TCE8)*

*"I visit every single lunch bar, every single premise that I can think of to find out if they do sell tobacco. So having a register of people who sell, would be a lot easier for me." (TCE11)*

Two participants suggested a potential benefit of registration was that it may even deter some retailers from selling tobacco:

*“It’s just another step that people would have to go through in order to sell tobacco and... if a retailer doesn’t have the patience to, you know, go through the registration process, then that would probably be somewhere where tobacco wouldn’t be sold.” (TCE1)*

Others felt that a registration system such as this lacked rigour, and did not consider it to be a particularly effective way of enhancing enforcement:

*“...So it’s just a simple registration that would just provide us information with who was selling tobacco?... the Public Health Units already hold that information. So as part of our contract with the Ministry of Health, we are supposed to have an up-to-date list of tobacco retailers.... I don’t see any point to the [registration] system because all that will do, is tell us what we already know.” (TCE12)*

Yet this view was not shared by all participants, and several of the SEOs stated that maintaining lists of tobacco retailers was challenging. Overall, participants tended to see that there would be some benefits to registration of tobacco retailers, yet there was a sense that this was not a worthwhile policy to advocate for by itself.

#### *Licensing of tobacco retailers*

Whilst some participants mentioned a registration scheme for tobacco retailers as their preferred short-term intervention, most referred to licensing of retailers. There appeared to be some confusion over the terminology, as a small number of participants used the terms ‘registration’ and ‘licensing’ interchangeably, and saw them as the same type of system:

*“...registration is the public relations term for it but, it’s exactly what a licensing regime should look like.” (TCE3)*

Nevertheless, most participants saw a clear distinction between registration and licensing of tobacco retailers. One of the key differences was that, unlike registration,

licensing would provide a means to introduce conditions regarding who could sell tobacco:

*“A register is just a list. A licence, I guess, will have a difference. Technically there must be some conditions for a licence.” (TCE6)*

Participants saw other potential benefits to a licensing scheme. First, they suggested a mandatory fee as a key component of licensing, and thought this could be set at a level that deterred retailers from selling tobacco:

*“... you’d want to place a licensing fee that’s high enough that little...retailer on the corner dairy’s probably gonna go ‘no’, because then that way we’re reducing supply to the market at the same time.” (TCE11)*

In addition to a licensing fee, participants suggested other requirements that could be placed on tobacco retailers as part of the licensing conditions. Examples included staff training on the current smokefree legislation, and having retailers demonstrate sufficient knowledge of the legislation before a licence was granted.

*“...I think giving people the opportunity to know exactly what’s legal and what’s not would be an important element of a licensing regime. So they might have to pass a little test in the same way to get a driver’s licence or something like that...” (TCE9)*

Participants tended to believe that requiring retailers to demonstrate knowledge of the smokefree legislation was a useful part of a licensing regime, but that by itself this would do little to improve compliance by retailers; a lack of knowledge about smokefree legislation was not considered the main factor contributing to tobacco sales to minors.

*“I don’t know that that by itself would necessarily do much, but... that would be a sensible thing to include...” (TCE4)*

Several participants felt concerned that minors were often involved in selling tobacco at small retailers and dairies. Some suggested that licensing could help prohibit this practice:

*"...[if] they've got a licence to sell tobacco, there has to be somebody in the premises at all times that is approved to sell it. And that means an adult, who can be punished and put in jail or fined if they don't comply, as opposed to the 16 year old store kid, or the 16 year old daughter of the dairy owner, who can't be fined and penalised." (TCE2)*

Several participants saw a key benefit of a licensing system was the ability to penalise retailers who breached the legislation, by revoking their ability to sell tobacco:

*"...it would also provide another mechanism for punishment when they're found to be breaching the legislation, than being fined or simply warned you'd have the mechanism to suspend or completely revoke someone's licence to sell tobacco. I think that would be a really powerful tool for enforcing the age limit legislation." (TCE4)*

Others saw licensing as enabling better communication between government agencies and tobacco retailers, which would go some way towards countering the industry's influence on retailers:

*"..by having that licensing, the Ministry would have to be informing those retail outlets of their legal responsibility, whereas most of the information they get now is from the tobacco companies." (TCE5)*

Participants agreed on the need for a regulatory system for tobacco retailers; most preferred a licensing regime over a registration system, citing several benefits that would be specific to licensing. The interviews then explored different policies that could be introduced as part of licensing.

*Requiring tobacco retailers to stock Nicotine Replacement Therapy (NRT) products*

Participants were asked how they felt about the idea of introducing legislation that required tobacco retailers to stock NRT. This idea drew polarising responses from participants. Several supported this idea and one explained that he believed tobacco retailers could play a role in supporting smokers to quit:

*“...the customer will say ‘look I’ve quit’, and a lot of the retailers are quite supportive of that and will try and help the individual by talking to them and in some instances encouraging them not to buy tobacco, so I think some retailers ... we could work with them to become a bigger advocate for tobacco control, or possibly even further and provide cessation support.”*  
(TCE12)

However, most participants opposed the idea. Some believed that it was contradictory to allow retailers who profited from tobacco to have a role in discouraging smoking, whilst others expressed concerns around the impracticalities and retailers’ lack of expertise to be able to provide advice on using the products safely:

*“...they’d need to do some training and they need to have that time to actually assess that customer to make sure that they’ve got the right sized patches and gum. Now...you’re not gonna have five or ten minutes to do a smoking cessation consultation while six people are lined up to get bread and milk.”* (TCE11)

Other reasons that participants did not support the idea included a perceived lack of effectiveness and acceptability. However, one participant described a scenario in which she considered this approach could be effective; she suggested making nicotine replacement therapy products available alongside tobacco but at a much cheaper cost than tobacco:

*“...if they were selling tobacco and they had to sell an effective cessation aid at the same time and it was much less [money], then it might help some people stay quit if they saw [nicotine] gum for \$5 and a packet of cigarettes*

*is \$20...The price option has to be much different than it currently is... addicts always go for the cheapest drug... They're not gonna pay \$20 to \$15 for some Nicorette, versus \$20 for a packet of much more satisfying cigarettes." (TCE2)*

Views on requiring tobacco retailers to sell NRT were mixed, though, overall, most participants did not appear to consider this would be a feasible policy. The interviews then discussed different policies that could achieve reductions in tobacco outlet density.

#### *A 'sinking lid' approach*

Participants tended to view the ultimate goal of tobacco retail regulation as a way to substantially decrease the number of tobacco outlets in NZ. The benefits of reducing tobacco supply included making tobacco harder to access for consumers and denormalising tobacco as an everyday product. Several participants stated that their preferred policy of reducing tobacco outlet density was via a 'sinking lid', though this approach tended to be conceptualised in slightly different ways. Some viewed a sinking lid as requiring tobacco retailers to pay a fee in order to sell tobacco, whereby the fee would initially be determined according to their sales volume (i.e. so that small independent outlets such as dairies would pay less than large supermarkets) but would progressively increase so as to decrease the number of retailers choosing to sell tobacco.

*"...that fee in the first year...will be at a level that is market researched to lop off about 1,000 [retailers]... just because of the inconvenience of paying that fee. And from that year forward, we will have a sinking lid policy on that registration fee, it will get higher and higher and higher based on market research from the impact of the last year's fee. Until we've got virtually no one selling tobacco... it's a sinking lid on the number of retailers, but the measure to take is through price." (TCE3)*

Others conceptualised this idea as a tobacco retailer licensing model where licences could not be transferred if a retailer ceased selling tobacco or moved or closed down. This approach was described as a way to gradually decrease the number of tobacco retailers over time and a more acceptable option to retailers. By contrast, the idea of imposing an immediate maximum quota of retailer licences was considered as random and unfair:

*"I think...to arbitrarily go into the community and say that in this particular area there are currently 500 retail outlets, we think there should only be 400, or 250, therefore we're going to revoke licences for half of them... It seems quite capricious and arbitrary in a lot of respects.... whereas a sinking lid policy would say, 'well look, if a service station on the corner closes down, goes out of business for whatever reason, then that registration or that licence - whatever you want to call it - is not then issued to another retailer in that area'. We're not arbitrarily just taking it away from any retailer."*  
(TCE4)

The third way in which participants viewed a 'sinking lid' policy would involve banning tobacco sales at certain outlets, gradually extending the outlets prohibited from selling tobacco:

*"...I think it should be sort've like a staged sinking lid approach. So let's stop all of the corner dairies to start with. And then... whether it's six months or a year down the track, let's stop dairies and obscure places like lunch bars... then let's stop it in licensed premises... your supermarkets probably would be next and then your petrol stations..."* (TCE11)

Overall, participants considered that a sinking lid approach was a worthwhile policy to pursue and generally agreed this should involve a staged or gradual reduction in tobacco outlet density over time. However, there was no consistent conceptualisation of the precise nature of the sinking lid policy.

### *Restricting tobacco sales by outlet type*

As indicated in the previous quotation, several participants suggested restricting tobacco sales by outlet type. In particular, SEOs preferred removing the sale of tobacco from dairies, as they reported that dairy owners and employees were the usual perpetrators of sales to minors. Yet, when asked how they felt about disallowing tobacco sales at dairies, other participants reported this could be seen as unfair and unacceptable among stakeholders:

*"...it would be a reasonable argument for the tobacco lobby and other people to make that, the approach where you limited - for example - the number of small retailers or dairies selling tobacco could be seen to be unfair... you get into the territory of acceptability and that sort of thing."  
(TCE4)*

Furthermore, prohibiting tobacco sales at dairies or other small retailers was also seen as a risky approach that could potentially attract legal action by the tobacco industry:

*"...[the Government] open themselves up to litigation by the tobacco industry whenever they discriminate against a specific business type. It's against international trade laws to do that... so I wouldn't advise that, no... I would always advise against... discriminating one form of business over and above another." (TCE3)*

Another policy that participants were asked to discuss was to prohibit the sale of tobacco at licensed premises. This approach elicited mixed views from participants. Some, for example, spontaneously referred to the need to break the association between alcohol and smoking, and no longer wanted tobacco to be sold alongside alcohol:

*"I don't think licensed premises should be able to sell smokes, because smoking and alcohol go hand in hand." (TCE11)*



*“...I wouldn’t want it to go into alcohol stores ‘cos those things kind’ve go hand in hand.” (TCE1)*

Yet several other participants did not support the idea; they either believed that it could distract from higher priority tobacco policies, or expressed doubt over its effectiveness:

*“I don’t know that it would make that much difference. I’m trying to think of somebody that would go in for their beer and if they can’t get the cigarettes there, are they going to not go and get them somewhere else? I don’t think so, yeah I’m not so sure about that one actually.” (TCE10)*

Participants expressed merits in removing tobacco sales at dairies, but also concern about the perceived fairness and acceptability of this approach. Some considered that there could be advantages in disallowing tobacco sales where alcohol was also sold, yet overall this measure tended not to be considered a high priority.

#### *Restricting children’s exposure and access to tobacco retail outlets*

Protecting children from exposure to tobacco outlets was a dominant concern in all of the interviews. Many participants spontaneously cited the need to create zones around schools where the sale of tobacco was prohibited:

*“I’d get them away from schools would be a good start.” (TCE6)*

For those participants who did not raise the possibility of banning tobacco sales around schools spontaneously, each respondent was supportive when they were asked their views on this approach. Two suggested this measure could be extended to disallow tobacco sales at a broader range of locations where children tended to be present:

*"...you could have some restriction around location, in regards to say, schools... Schools are easy because we're very worried about children... then you could look at phase two where you could consider... community centres, libraries, youth centres, that kind of thing..." (TCE9)*

Several participants also raised the possibility of only allowing tobacco sales at stores that children were not allowed access to, as opposed to a zoning approach. These outlets were described as "specialised" or "R18" stores, or, as one participant suggested, tobacconists:

*"I've heard of a retailer somewhere in New Zealand that only sells tobacco and they were advocating for that, 'cos... you can't have kids in a tobacco store, 'cos you can't be under 18 and buy it." (TCE2)*

#### *Pharmacy-only tobacco sales*

A corollary of restricting sales to specialised outlets involved tobacco sold only by pharmacies, either for retail sale or by prescription:

*"...so I mean ultimately, I would like us to move towards the non-retail selling of tobacco... it's where you end up providing tobacco through some other mechanism, either through potentially pharmacies or doctors or you could have... one shop in each Territorial Authority that provides the tobacco." (TCE12)*

Several participants spontaneously cited the idea of only allowing tobacco to be sold at pharmacies and, as such, this appeared to be a particularly favourable approach:

*"I guess going back to your original question about what I see for 2025, I see that cigarettes will need to be on prescription." (TCE5)*

*"I think if we're going to the 5% [smoking prevalence], pharmacies should be the only places that sell cigarettes, and on prescription only." (TCE11)*

Almost all participants supported a long-term scenario where tobacco was only available from a very small number of outlets throughout New Zealand, whether this was at pharmacies, or specialised outlets where children were not permitted.

### ***Barriers to policy adoption***

#### *Political will and acceptability of policy options*

Participants put forward a range of different perceived barriers and challenges that could potentially impede policy development. As mentioned in an earlier section, participants believed that a combination of interventions was necessary to achieve 2025, yet there was tension and uncertainty about which measures should be prioritised, and how many measures might be feasible:

*“I mean if you kind’ve go for plain packaging, do you want to get their backs up if you tried to push this idea through at the same time? It might be the straw that breaks the camel’s back politically and lose public support or something.” (TCE9)*

In regards to the discussion around registration and licensing of tobacco retailers, there was uncertainty within the sector about the preferred option. Some saw registration as being much more politically acceptable than a licensing scheme, and therefore saw this option as being more likely to be adopted by the government than licensing:

*“...Is it a registration system we’re asking for or do we just go for the licensing system?...Governments don’t favour the licensing kōrero<sup>5</sup> and the registration kōrero is much more palatable....so... do you go in for what you really want or do you start with something simple?... we want the same thing, it’s just how to get there.” (TCE8)*

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<sup>5</sup> Kōrero (indigenous word meaning “talk”; can be interpreted here as meaning “approach”)

Some participants saw registration as a first step which, once in place, could be strengthened to include conditions on who could sell tobacco:

*“...I would focus very much on the early stages at least on just getting the concept of a register acceptable to people... then once it’s established then you can make further legislation around things like a sinking lid on registrations, targeting high density areas. That would be more acceptable I think... whereas if you bundled it all together it would be easier to argue against.” (TCE4)*

One participant offered a different viewpoint, where she perceived registration as the lesser option. She considered advocating for this idea as both risky and a waste of resources, given that if registration was legislated, there was no guarantee that further conditions on retailers would ever be implemented.

*“...I don’t really like that idea of pussy-footing around and putting energy into a registration system that’s gonna do what? I’d rather go for a licensing system straight away...” (TCE8)*

A lack of political buy-in for tobacco control measures was considered a likely barrier, and this was related to a perception that tobacco was not a priority issue:

*“the biggest challenge there I believe is... many people believe that tobacco’s not a problem anymore, and that it affects only a small number of people these days.” (TCE12)*

Participants also expressed pessimism about the likelihood of achieving a smokefree nation by 2025, which was linked to a perceived lack of government leadership in the area and the loss of Dame Tariana Turia<sup>6</sup> as the main political champion of the goal:

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<sup>6</sup> Dame Tariana Turia is a former NZ politician and leader of the Māori party and is widely credited with achieving the Government’s commitment to 2025.

*“...the chances of us achieving it [2025] as a nation are really strongly linked to public policy and...despite all the best efforts of people in the tobacco control sector, without really substantial and quite brave public policy measures by the Government of the day, it’s gonna be a really challenging target... with the recent election and current Government...I’m less confident now that it’s achievable.” (TCE4)*

#### *Acceptability to tobacco retailers*

Several participants thought tobacco retailers would view measures to reduce the number of tobacco outlets as unfair, particularly owners of independent dairies and convenience stores who were said to rely more on tobacco as an income source than larger chain stores. Yet some were unconcerned about the effects of regulation on tobacco retailers and strongly disapproved of businesses that relied on tobacco and other unhealthy products:

*“...some of the dairies I’ve spoken to say, you know, 50% of their sales comes from tobacco and what would they do if they couldn’t sell tobacco anymore and... if 50% of their viable income comes from the sale of tobacco, then what does that say about New Zealand? Is that what we want a business to be able to survive on? Something that costs the country billions in healthcare?” (TCE2)*

*“My view is if dairy owners are only going to be able to sustain their business by selling tobacco, alcohol and lotto tickets, then they do need to go out of business. And as a society we have to be tough minded about that... they shouldn’t be in business if all you can sell is stuff that’s bad for people.” (TCE7)*

This view appears to contrast with other participants who were concerned with the idea of fairness to retailers as a way to ensure policies were politically acceptable. Some participants alluded to the idea that many tobacco retailers would prefer not to

sell tobacco, and there was a sense that retail policies would be seen as fair and acceptable if they were non-discriminatory (i.e. did not favour one business over another). One participant described instances where retailers could successfully stop selling tobacco, though acknowledged this depended on the location of the retailer and her or his clientele:

*“I’ve seen evidence that retailers, given a bit of imagination, can actually withdraw from selling tobacco and do quite well in some situations. And so they can turn it around and become purveyors of coffee or healthy products and rebrand themselves and just refuse to sell tobacco and still grow their business. I don’t know whether that would work in, for example, corner dairies in suburbs where there’s a high smoking prevalence. I think they would potentially lose out unless they had alternative products that were demanded...” (TCE9)*

### ***Overcoming barriers***

Despite the range of perceived barriers and challenges, two consistent themes were expressed regarding the way in which policy change could be achieved. The first was the need for more awareness and impetus around the 2025 goal in order to generate public support:

*“...more publicity about the goal and how that is something the whole country is working on together. I mean, New Zealanders are great at getting behind something if they’re given the right sort of leadership and I think this would be a great goal for people to get behind.” (TCE11)*

The second theme was the need for stronger government leadership to achieve the goal and bring new policies into place:

*“...if we’re ever going to have any hope of reaching the goal and it just really needs a lot more oomph behind it...the oomph needs to come from everybody but it needs to come from the Government particularly because it is their goal.” (TCE11)*

Overall, many of the participants expressed pessimism over the likelihood of achieving the 2025 goal, yet they also acknowledged that if the Government introduced new policy measures – such as taxation, plain packaging and reductions in outlet density - the 2025 vision was achievable.

## Discussion

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New Zealand's smokefree stakeholder groups have been influential in shaping tobacco control policies in NZ over several decades (Studlar, 2005). The sector's views and advocacy efforts are likely to influence the tobacco control policies introduced in the future. Participants believed that tobacco retail regulation was one important part of the intervention suite needed to achieve the 2025 goal. Their views reflect the measures laid out in the NSFWG's action plan and roadmap (National Smokefree Working Group, 2015a) and align with international discourse about the role of supply-side policies in the tobacco endgame (Malone, 2010; Thomson, Wilson, Blakely, & Edwards, 2010). Participants believed that substantially reducing the number of tobacco outlets would reduce tobacco consumption, improve enforcement, prevent sales to minors, and support tobacco denormalisation. In this regard, the views of the NZ tobacco control community align with international researchers who advocate for reducing outlet density as a key tobacco control measure (Ackerman et al., 2016; Lipperman-Kreda, 2016; Tilson, 2011; Tilson et al., 2013).

There is limited research to which the findings can be compared. However, one recent NZ study used a structured qualitative methodology to assess perceptions of four "radical" endgame policies - one of which included a reduction in tobacco availability of at least 90% - amongst 19 key informants (i.e. politicians, senior public servants, managers of tobacco control providers, researchers and advocates) (Ball, Waa et al., 2016). Like Ball, Waa et al. (2016), we found that participants supported substantial reductions in tobacco outlet density. Several suggested making tobacco available only at pharmacies, though many believed that other policies, such as taxation, should remain a higher priority. Ball, Waa et al. (2016) concluded that a dramatic reduction in tobacco outlet density may not be as politically feasible as it may appear 'anti-business'. Nevertheless, the study presented in this chapter explored how a substantial reduction in tobacco availability could be achieved, and evaluated the relative merits of policy options that might bring about such a reduction.

Participants suggested reducing tobacco outlet density could be achieved incrementally, an approach they thought would be more politically acceptable. They



suggested either registration or licensing of tobacco retailers as an intermediate measure; and saw the former as more acceptable but considered the latter would bring greater benefits. In particular, they thought a licensing fee and associated conditions, including a requirement for staff training, prohibiting people aged under 18 years old from selling tobacco, and restrictions on where tobacco could be sold, made licensing a potentially more effective option. Wider support for licensing has come from a NZ research team that included an NZ law expert, who recently stated that licensing would be an essential prerequisite for any restrictions on tobacco retail availability (Palmer, Bullen, & Paynter, 2013).

Several participants saw a sinking lid policy as acceptable and viable and this option also has support from other NZ tobacco control researchers (Thomson et al., 2010). Less popular policies included requirements that tobacco retailers stock nicotine replacement therapy products, and prohibitions on tobacco sales at certain types of store (i.e. disallowing sales at dairies or at outlets that sold alcohol). Participants saw these ideas as either less politically acceptable and/ or effective than other policy options. Barriers to policy adoption noted by participants reflect those identified by other tobacco control experts and represent political challenges: lack of political will or leadership, opposition from groups with vested interests in the *status quo* (Malone, 2010; Thomson, Edwards, Wilson, & Blakely, 2012), and the threat of legal challenges to new legislation (Ackerman et al., 2016). Several participants expressed strong views in regards to the morality of retailers who rely on unhealthy products to support their livelihoods, and indifference towards the impact of policies on retailers. These views contrasted significantly with those of other participants who were concerned with fairness, insofar as policies seen as fair by retailers were considered more likely to be politically viable. Participants also expressed concern about the number of tobacco control measures that could realistically be adopted, and clearly saw some measures, such as plain packaging, as having higher priority than retail restrictions.

This study, to our knowledge, is the first to explore the views of NZ's tobacco control sector in relation to potential tobacco retail policies. Identifying where consensus exists amongst the sector could help to inform future advocacy, and ensure that limited advocacy resources are used efficiently. A strength of the study is the wide range of

participants interviewed, who came from academia, health NGOs and government agencies. The qualitative approach enabled a detailed examination of participants' views towards tobacco retail policies and some of the values and concerns associated with this area of tobacco control.

Some limitations should be noted. The findings in the study represent a 'snapshot' of participants' views, which may change over time and are highly likely to be affected by the current political context. At the time of data collection, the Smoke-free Environments (Tobacco Plain Packaging) Amendment Bill (New Zealand Government, 2014) had undergone its first parliamentary reading and public consultation, but had been put on hold pending the outcome of tobacco industry litigation in Australia (Ministry of Health, 2014b). Since data collection, the NZ Government has asserted that the plain packaging Bill will likely be introduced by the end of 2016 (Kirk, 2016), yet at the time, participants may have been more cautious towards the possibility of advocating for tobacco retail regulation. Indeed, several participants in this study felt concerned about the potential for distracting political attention from plain packaging. Another limitation was that perceptions about equity outcomes were not specifically examined and, furthermore, the vast majority of our participants were of NZ European ethnicity. Examining the impact of tobacco control policies on smoking amongst Māori, Pacific and people from lower socioeconomic backgrounds is important, given that substantial reductions in smoking prevalence among these groups needs to occur for the 2025 goal to be realised. A further limitation in relation to the study sample was that certain sub-groups of NZ's tobacco control sector were not represented. Specifically individuals who worked for the Ministry of Health and Health Promotion Agency, and two former politicians who had been actively involved in tobacco control, were not able to take part. Their views would likely have provided a different and useful perspective on the policies discussed. A limitation with all qualitative research is that the views and beliefs of the researchers invariably influence the study process, from conceptualisation, interaction with participants, and data interpretation (Kuper, Reeves, & Levinson, 2008). Lastly, the transferability of findings to other settings is limited, given the focus on the NZ context.

In conclusion, key informants within the tobacco control sector believe licensing of tobacco retailers is an important intermediate step in achieving the 2025 goal, and envisage tobacco being available only at a small number of specialised outlets in the long-term. One of the perceived barriers was opposition from tobacco retailers. The next chapter explores this issue in more detail, by examining tobacco retailers' views towards potential tobacco retail policies.

# **Chapter 5 – A qualitative analysis of NZ tobacco retailers' views**

## Introduction

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For jurisdictions considering strategies to regulate tobacco retailing, the views of key stakeholder groups, including tobacco retailers, may influence the adoption of policies. Only a small number of studies have explored retailers' perceptions and experiences with tobacco control policies (e.g. Feighery, Ribisl, Clark, & Haladjian, 2003; Guthrie, Hoek, Darroch, & Wood, 2015; Jaine et al., 2014; Rose et al., 2015; Thomson, Hoek, Edwards, & Gifford, 2008). In the U.S., in-depth interviews with tobacco retailers have provided insights into industry retailer incentive programmes and the way these schemes influence product placement and promotion in stores (Feighery et al., 2003). In a more recent U.S. study, researchers have investigated how retailers' opinions about tobacco control policies affect store compliance, and found a lack of support for POS policies was associated with greater noncompliance (Rose et al., 2015). Previous NZ research has investigated retailers' opinions towards POS display bans (Thomson et al., 2008) and plain packaging (Guthrie et al., 2015). These studies have played an important part in informing the debate around these policy proposals.

In a 2012 NZ study, tobacco retailers reported being ambivalent about selling tobacco and several supported the idea of tobacco retail licensing (Jaine et al., 2014). However, an in-depth analysis of views on licensing was not reported, and the study did not investigate retailers' views on different policy options to reduce tobacco availability. While retailers' opinions tend to receive relatively little attention, by contrast, the tobacco industry has often claimed to represent tobacco retailers' views, most recently when opposing plain packaging policies (Deloitte, 2011; Roy Morgan Research, 2013; Savell, Gilmore, & Fooks, 2014). Similarly, national retailer organisations such as the NZ Association of Convenience Stores (NZACS) frequently make submissions on proposed tobacco control policy. Yet, NZACS counts Imperial Tobacco, British American Tobacco and Philip Morris International among its members, its spokesperson is a former tobacco lobbyist (Rutherford, 2014), and tobacco industry executives are represented on the governing Board (New Zealand Association of Convenience Stores, 2015). Consequently, their submissions clearly represent industry interests, which may not mirror those that individual retailers hold (Hoek, Vaudrey,

Gendall, Edwards, & Thomson, 2011; Thomson et al., 2008). This project explored tobacco retailers' views of mandatory licensing and other policies that could reduce the availability of tobacco products. Factors underlying retailers' views were examined, as their perceptions may be amenable to change through media advocacy or education. As a secondary aim, we explored retailers' relationships with the tobacco industry, as very little NZ research has examined this area.

## Method

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### Sample

Known tobacco retailers in NZ were drawn from a NZ database developed in a previous study, which identified 5008 outlets (Marsh, et al., 2013). Whilst reasonably comprehensive, the database likely underestimates the actual number of retailers in NZ; British American Tobacco report having around 7,800 retail customers throughout NZ (Euromonitor, 2014). A purposeful sampling strategy was used (Patton, 2002), with retailers stratified by outlet type, neighbourhood-level SES, and urban vs rural location. Approximately equal numbers of retailers were drawn from the North and South Islands of NZ. This procedure ensured we obtained broad representation of retailers in NZ. The following types of retail outlet were included in the sample: *dairies*, *small supermarkets* (typically a larger premises than a dairy with a wider range of products, often including alcohol, sometimes referred to as mini-marts); and *supermarkets*, *service stations* and *liquor stores*. These categories represent the main types of outlets selling tobacco in NZ and, collectively, they comprise approximately three-quarters of the known tobacco retail outlets (Marsh, et al., 2013). We anticipated that saturation of themes would occur at around 22-25 interviews, therefore quotas of 4 to 5 retailers were set for each category of retailer. An address was defined as being “urban” if it was located within a “main urban area” according to Statistics New Zealand maps (Statistics NZ, 2004); all other addresses were categorised as “rural”. Data on the SES of the neighbourhood of the outlet were obtained in a previous study using 2006 census data and GIS software (Marsh, et al., 2013).

### Qualitative approach

The approach used in this research was the same as that described in Chapter 4, qualitative description. This is a pragmatic qualitative research method with an emphasis on obtaining information for practical application (Neergaard et al., 2009). A semi-structured interview was used, whereby the discussion topics were specified in advance, though flexibility in wording and sequencing of questions was retained by the researcher to ensure the interview remained natural and conversational (Patton,

2002). The interview guide consisted of general introductory questions about the most popular tobacco brands retailers sold. Following this introduction, the interview explored participants' views on existing tobacco control policies (including the POS display ban and annual tax increases of 10%), the 2025 goal, selling tobacco, and possible future policies, such as tobacco retailer licensing (Appendix 8).

### **Procedure**

Retail stores in the sampling frame were approached in person by LR, who asked to speak with the owner of the store or the manager. If neither the owner nor manager were available, a suitable time to return to the store was arranged, where possible. Once participants had read the information sheet (Appendix 9), a suitable time for an interview was arranged at the store premises. Before the interview was carried out, written consent was obtained from each participant (Appendix 10). Where possible, interviews were conducted in a store office, however around one quarter of the interviews took place on the shop floor and interviews were paused when customers entered and made purchases. Each interview was audio recorded and subsequently transcribed. Data collection was conducted between May and November 2014 and all interviews were conducted by LR. Data analysis was carried out by LR and began whilst interviews were being carried out. Interviews continued until the point of saturation, where no new themes emerged. Ethical approval was obtained from the University of Otago's Human Ethics Committee (ref 13/147).

### **Analysis**

Interview transcripts were checked for accuracy against audio files, and qualitative content analysis was undertaken using transcripts as the data source. Qualitative content analysis focuses on summarising the informational content of the data (Morgan, 1993). Data were initially analysed in a deductive manner using the interview guide as a framework, and inductive analysis was also used as patterns were identified within the data themselves (Patton, 2002). After coding all the interview notes, the data were sorted to identify themes. Commonalities and differences among



the data were identified and extracted for further consideration. A supervisor (LM) coded three randomly selected interviews. The initial themes were compared between LR and LM who subsequently reviewed and finalised themes through discussion.

## Results

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### Participants

Contact was made with a total of 50 retail outlets; of these, 48 sold tobacco, and 21 agreed to take part in the study. Amongst the 27 retailers who did not participate, most declined because the owner or manager was not available (n=15). Twelve retailers refused to take part; six were too busy, two were uninterested, and four said they would need permission from Head Office and did not make further contact with the lead researcher. The latter four retailers were from three different chain stores, though two of these chains were represented in the final sample (and these participants did not report requiring pre-approval from Head Office). Response rates for each category were as follows: supermarkets (36%; n=4/11); small supermarkets (50%; n=4/8); service stations (40%; 4/10); liquor stores (40%, n=4/10) and dairies (56%; n=5/9). As shown in Table 12, the final sample comprised a range of store types and was varied in terms of SES and rurality. Twelve interviews were conducted in the North Island of NZ and nine in the South Island. Approximately half of the participants owned their retail store, the remainder were managers; the majority had held their role for at least three years. Participants were from varied ethnic groups and comprised both smokers and non-smokers. With the exception of one interview that lasted only 11 minutes, interviews ranged from 14 to 40 minutes in duration, lasting a mean of 24 minutes.

Table 12. Participant demographics and store characteristics

ID	Outlet type	Urban/ Rural	Outlet SES	Role	Length of time in position	Age (yrs)	Ethnicity	Sex (M/F)	Smoking status and frequency
RE1	Supermarket	Urban	Mid	Manager	< 1 yr (in business 8 yrs)	24	Māori	F	Smoker, 12-15 per day
RE2	Dairy	Urban	Low	Owner operator	7 yrs	48	Indian	M	Non-smoker
RE3	Liquor store	Urban	Low	Manager	8 yrs	30	Indian	M	Non-smoker
RE4	Dairy	Urban	Low	Owner operator	4 yrs	44	Indian	M	Former smoker
RE5	Service Station	Urban	High	Manager	3 yrs	37	NZ European	M	Non-smoker
RE6	Liquor store	Urban	Low	Manager	3 yrs	27	Indian	M	Non-smoker
RE7	Dairy	Urban	Low	Owner operator	< 1 yr	26	Chinese	M	Non-smoker
RE8	Dairy	Rural	Mid	Owner operator	6 yrs	58	Pacific Island	M	Smoker, 5-6 per day
RE9	Supermarket	Rural	High	Manager	15 yrs	43	NZ European	F	Smoker, 5-6 per day
RE10	Small supermarket	Rural	High	Manager	11 yrs	64	NZ European	F	Smoker, "occasional"
RE11	Service station	Rural	High	Manager	< 1 yr	24	Indian	M	Non-smoker
RE12	Small supermarket	Rural	High	Owner operator	3 yrs	53	Pacific Island	M	Non-smoker
RE13	Supermarket	Urban	Mid	Owner operator	3 yrs	35	NZ European	M	Non-smoker
RE14	Service station	Rural	Mid	Manager	4 yrs	38	NZ European	F	Smoker, 15 per day, using NRT
RE15	Small supermarket	Rural	High	Owner operator	3 yrs	33	NZ European	M	Non-smoker
RE16	Small supermarket	Rural	High	Owner operator	< 1 yr (in business 18 yrs)	57	NZ European	F	Non-smoker
RE17	Supermarket	Rural	Mid	Owner operator	3 yrs	44	NZ European	M	Non-smoker
RE18	Liquor store	Rural	Mid	Owner operator	2 yrs	64	NZ European	M	Non-smoker
RE19	Liquor store	Urban	High	Manager	1 yr	38	NZ European	F	Smoker, "heavy"
RE20	Dairy	Urban	High	Owner operator	4 yrs	49	Chinese	M	Non-smoker
RE21	Service station	Urban	Mid	Manager	5 yrs	51	NZ European	M	Non-smoker

## Interviews

The results of the interviews are framed around participants' views on: (i) current tobacco control policies, ii) the 2025 smokefree goal, (iii) mandatory licensing of tobacco retailers, iv) reducing the retail availability of tobacco generally, v) specific policies to reduce the availability of tobacco, vi) promoting smoking cessation, and vii) the tobacco industry. Retailers' views tended not to differ with store type or by smoking status, but exceptions are noted below.

### *Current tobacco control policies*

Participants were asked for their views on existing retail-level tobacco control measures (e.g. annual tax increases and the point-of-sale display ban), to explore whether they had uniform views towards regulation in general, or if their attitudes depended on the specific policy under discussion. Participants tended to support the annual tax increases, which they believed had the greatest impact of all tobacco control policies on smoking cessation and tobacco consumption. However, participants also expressed concern about the impact of price increases on children whose caregivers smoke, and saw tobacco addiction as a contributing factor to poverty:

*"But the people who haven't got a job, they still smoke and they get poor... Some family got a problem, you know, the family they got kids... not enough food. They not have clothes, good enough clothes. Because I think they spend more money on the, the cigarettes so they got...not enough money for the kids." (RE20; Dairy Owner)*

*"...there's people whose kids are going without, so mum can have a cigarette." (RE14; Service Station Manager)*

Some participants believed that the government was to blame for the poverty arising from the increasing price of tobacco, as opposed to the addictive nature of the product or the industry itself:

*“What you’re actually effectively doing by the government putting up the price, is transferring that down to the children in the family. That’s what effectively you’re doing... smokes go up \$3, ok well we won’t get that extra two litre of milk this week...we won’t um, be putting as much petrol in the car so therefore the kids have gotta walk. Oh, ok, so cigarettes are \$30 a packet of 40... god those kids need new shoes. Oh, I need my cigarettes. You know, that’s the, the social economic, um, hit on the community. That’s where it gets hit.” (RE9; Supermarket Manager)*

Discussion regarding the POS display ban revealed that some participants supported this measure because they believed it would help prevent young people from smoking, or for reasons of self-interest such as enhanced security for their tobacco stock. However, several participants viewed the display ban as ineffective because they had not seen an immediate change in tobacco sales:

*“We have noticed no decrease in sales of cigarettes. So ... it hasn’t really achieved what the aim was, I suppose.” (RE15; Small Supermarket Owner)*

In addition to investigating opinions on tobacco tax increases and the POS display ban, we explored participants’ views on the 2025 goal, since knowledge of and perceptions about the goal may affect participants’ assessment of future retail policies.

### ***2025 goal***

Participants were asked whether they had heard of the government’s 2025 smokefree goal, what they thought this meant, and how they felt about it. Almost all participants had heard about the goal, though only a minority could describe it accurately. Many were positive about the concept of a smokefree nation, regardless of whether they were smokers or non-smokers themselves:

*“I, I think it would be a great idea...I think it’s absolutely fantastic.” (RE18; Liquor Store Owner)*

However, others doubted whether the 2025 vision was achievable. Many misunderstood the goal, and perceived it to mean a complete ban on tobacco use. Others thought negative consequences, such as a loss of tourism revenue and increases in illegal activity or other unintended effects, would force the government to revise the goal:

*"In theory this looks very good. But I think ah, New Zealand can't be like that. One main reason, our biggest income is from tourism... and they are chain smokers. You can't say that 'ok you coming here, you can't smoke'. They say 'oh, I am not going there.'"(RE4; Dairy Owner)*

*"Say they took smokes out entirely, people are gonna start growing...a black market type thing. It's not gonna erase smoking. And you'll end up getting people buying it from overseas." (RE1; Supermarket Manager)*

Only a very small minority of participants explicitly opposed the 2025 concept, and their lack of support arose from concerns for smokers' rights and individual freedom of choice:

*"Who are those... people to say the whole country has to be smokefree?... Where's... the people's rights to smoke?" (RE19; Liquor Store Manager)*

Participants' comments thus reflected ideas that varied from philosophical positions to commercial and pragmatic concerns about the goal. Nonetheless, it was clear some saw great merit in the 2025 vision and it is plausible that others would support the goal more strongly if they clearly understood its intention.

### ***Mandatory licensing of tobacco retailers***

Participants were asked to consider a scenario where shops wanting to sell tobacco had to have a licence. They were asked what they thought this policy meant (to check they understood the concept), how they felt about it, and the impact they felt it would have on their business. Participants had varied views on a potential retailer licensing scheme; around half felt either positive or indifferent towards the idea. One liquor

store manager said he would “definitely” support a licensing scheme, while several others expressed more neutral views and thought such a requirement would not “bother them”. The remainder did not support the idea; several drew comparisons with the alcohol licensing system and were unhappy about the prospect of more paperwork and the burden of an application process:

*“If we compare it to the liquor, um, it’s quite an in-depth process... they’ve got to do a full check of the store and... check our space that we sell tobacco in and all of that and then we’d have to get paperwork and then obviously we’d have to keep getting it updated... yet another thing to add to the checklists.” (RE1; Supermarket Manager)*

Participants also expressed concern about the possibility they may no longer be able to sell tobacco, either because they might not meet licensing conditions or because they could not afford the fee:

*“I don’t, ah like this one. I think that... if every shop checked, informant officer come over there, have a see that everything good, training should be done, they are doing right. And that is fine. Licence is harder, you know, then...you’ve got so many shops that won’t able to sell the smokes you know?” (RE11; Service Station Manager)*

*“I don’t think the tobacco company’s, going to pay for it...so basically it’s going to be paid by the retailers, which will just ... cut our margins.” (RE12; Small Supermarket Owner)*

Many participants reported that they would be likely to apply for a licence regardless of having to pay a fee, in order to remain competitive in the marketplace:

*“Yeah you’ve really gotta do it so you can compete. Otherwise consumers will go to the store that does... so unless no store sells it ... you’d have to do it really, you don’t have a choice.” (RE15; Small Supermarket Owner)*

Participants were also asked how likely they would be to apply for a licence if the fee was \$100 a year, and again, if the fee was \$500 a year. Those from large, branded businesses such as service stations and supermarkets were less concerned about a fee, whereas smaller independent retailers (who tended to report that tobacco made up a significant proportion of their revenue) reported that a sizeable fee could make the sale of tobacco unprofitable:

*"It wouldn't impact [us]...If we had to pay \$500 a year to sell tobacco, we'd pay \$500 a year to sell tobacco." (RE13; Supermarket Owner)*

*"If it's only \$100 it would be ok. But if it goes higher maybe, most will decline... \$500 may be ok. But if it was maybe \$1000, no." (RE7; Dairy Owner)*

*"\$100 a year... ah, that's pretty reasonable I think. Yeah. [If it was \$500] we'll probably think twice." (RE3; Liquor Store Manager)*

Participants also opposed a licensing system because they saw it as a government money-making scheme that would not bring a societal benefit:

*"It's probably gonna cost the owners money, which I think is just...government's way of trying to make more money." (RE19; Liquor Store Manager)*

*"That, to me, would just be a money-grabbing tax. For nothing. For no real purpose." (RE9; Supermarket Manager)*

Retailers who showed some support for licensing often showed an awareness of the public health rationale behind the policy:

*"As long as it's not money gathering. Yeah, so long as there's good reason for doing it, I mean I don't really have an issue. But if it's another, you know, fee. You know, as long as it's minimal, it's ok. And there's good intention, reason behind it... I mean it's much like a liquor licence I suppose so if you compare*



*it to that, it's probably no reason why they shouldn't do it... in theory that's showing a responsible retailer." (RE17; Supermarket Owner)*

Retailers' comments reflected their mixed concerns for the viability of their businesses as well as some acknowledgement of broader public health goals. This tension between personal and societal wellbeing was evident throughout their responses to potential policy initiatives.

### ***Reducing the retail availability of tobacco***

Participants were asked their views on the general idea of reducing the availability of tobacco in society; they had varied views on this topic. Some agreed and drew parallels with alcohol:

*"Yeah, I believe it could, it could be tidied up um, and limited as to where you can perhaps purchase it. Like...the um, liquor reform." (RE13; Supermarket Owner)*

Those who supported reducing the retail availability of tobacco often expressed regret about their own or a loved one's smoking, or held negative attitudes towards smoking in general:

*"I detest the stuff. I hate the smell... get the damn stuff the hell outta here... that's my view on smoking." (RE18; Liquor Store Owner)*

*"It is not good for you... my mum died of lung cancer ... due to smoking like a train, and just the amount of people who, who do get cancer..." (RE14; Service Station Manager)*

Those who did not support reducing the retail availability of tobacco tended to express a fatalistic attitude towards smoking, and were more likely to think that nothing could prevent addicted smokers from buying tobacco:

*“Just because people have to drive an extra 2km to get their tobacco...they will still buy it... if you’re a smoker and you want a cigarette, you’re gonna walk that distance, aren’t you?” (RE9; Supermarket Manager)*

Some also thought purchasing tobacco was about individual responsibility and viewed smoking as a ‘choice’:

*“People have got to be able to make their own choices and they’ve gotta be able to make good choices and bad choices. So, if everyone takes all those choices away...whether it be tobacco, whether it be alcohol, whether it be the right food to eat, I mean people aren’t learning themselves, are they?” (RE16; Small Supermarket Owner)*

*“If I choose to smoke, that’s on me, it’s not up to the government. Somewhere along the line, New Zealanders have to take personal responsibility... not allow the government to dictate what they believe their personal responsibility is.” (RE9; Supermarket Manager)*

Participants who opposed the idea of reducing tobacco availability outlined arguments often advanced by the tobacco industry, particularly in respect of individual responsibility, smokers’ rights and freedom of choice.

### ***Policy options to reduce availability of tobacco***

Participants were asked their views on specific policies, such as prohibiting the sale of tobacco around schools, at their type of outlet, at other outlet types, and wherever alcohol is sold. Support for these ideas varied, depending on the specific policy intervention under discussion. Most supported or felt indifferent to prohibiting the retail sale of tobacco within 500m of secondary schools. Those with positive or neutral views recognised the need to prevent young people from smoking:

*“Yeah I’d be happy with that, ‘cos I think the government should be focusing on new smokers, not existing...that would be a good idea.” (RE9; Supermarket Manager)*

Participants also appeared to hold more favourable views on this policy if they saw it as a measure that would first be introduced to new businesses, rather than as an immediate policy that would affect existing stores:

*“I understand why they’re doing it. Yeah, to stop the youth getting into it... but what I’m saying is don’t bring it in on the current people who are already there. If it’s a new business, ok.” (RE17; Supermarket Owner)*

Participants who did not support sales restrictions around schools saw no need for such a policy, and believed that nothing can stop young people who want to try smoking:

*“I don’t really see what impact that would have. It would only disadvantage the retailer... we’ve got a school up the road, we don’t have school kids coming in here trying to buy tobacco.” (RE15; Small Supermarket Owner)*

*“What’s it going to do? ...kids walk past here every day, we’re not 500m from a school... putting all those things in place is not going to stop them... If they want to smoke, they will still find a way of trying to get it.” (RE16; Small Supermarket Owner)*

Participants did not support prohibiting the sale of tobacco at a particular type of outlet, such as at dairies or at supermarkets, or prohibiting tobacco sales at locations where alcohol is also sold. They saw the first suggestion as victimising owners of those outlets who would not be able to sell tobacco and firmly believed that any reduction in the retail availability of tobacco had to be done in a way that was fair to all retailers:

*“As long as they slowly phase it out...like to suddenly take something off someone, I don’t think is fair... why wouldn’t we have the right to sell versus a dairy, or a liquor store, or a pub... As long as it’s fair across the board.” (RE17; Supermarket Owner)*

The main reasons for opposing the sale of tobacco where alcohol was sold were that participants could not understand the policy rationale and thought it would be unlikely to reduce smoking:

*"I wouldn't see any benefit or potentially what they would gain out of it... at the end of the day, people that drink, smoke ... they're going to go and get their alcohol whether they have to stop here or next door." (RE13; Supermarket Owner)*

However, three participants gave unprompted responses that if they had to make a choice between selling alcohol or tobacco, they would choose to sell alcohol:

*"...if that were to happen, we would keep liquor... tobacco would have to go... I actually make more money off liquor, so I would cut the tobacco." (RE1; Supermarket Manager)*

When contemplating the likely effects of these potential measures, several participants reported that not being able to sell tobacco would have a negative impact on their business. In particular, dairy owners reported that tobacco sales made up a substantial part of their sales (between 30-60%) although the profit margin was said to be less than 10%. However, participants from other outlets were more ambivalent about selling tobacco; some preferred not to sell it or could see advantages in not selling it:

*"We just stock them because there's a demand... I would prefer not to have them to be quite honest." (RE18; Liquor Store Owner)*

*"If they said to us 'you're not selling cigarettes', no skin off my nose. Really. Um, one less thing to stocktake. Um, less hassle of having to deal with younger people coming in and saying 'have you got ID?' and them having a tantrum 'cos they're actually like 30. That sort of thing... I mean if they, if they just set up like specialised sites where you could go and buy it, it doesn't bother me." (RE14; Service Station Manager)*

*“I could sell the space on checkouts...to the suppliers, probably make more money possibly... So where our tobacco units are on the checkout, I could sell that ‘cos that’s prime real estate... So I could sell that space and probably make some good money.” (RE17; Supermarket Owner)*

One participant said that the company he worked for was in the process of scaling down their tobacco sales, with a view to no longer selling tobacco in the future:

*“[Brand name] are trying to move themselves out of having to sell tobacco. ‘Cos we’ve already shrunk the size... Every year they are shrinking it... Because we, as a company, want to move away from selling petrol and selling smokes. That’s our business motto... we want to make money out of the coffee.” (RE5; Service Station Manager)*

Retailers’ responses suggest they are equivocal about stocking tobacco products, in the sense that several preferred not to sell them and did so purely for business reasons. Participants’ comments reflect concerns that policy-makers apply equitable regulations and recognise the adjustment retailers would need to make to develop new revenue-generating initiatives.

### ***Promotion of smoking cessation***

Participants were asked whether they stocked NRT products, reasons for not stocking these products, and about their perceptions of NRT’s popularity. Most participants did not currently stock NRT, mainly because when they had stocked them previously they did not sell well. However, some participants expressed a willingness to support people to quit smoking:

*“Look anything that we can ah, essentially um, you know, do to help people stop smoking um, all well and good, yeah... we might profit out of it in one hand, but on the other hand it doesn’t do anything for society.... So any educational stuff or things we can do to help get people off smoking, the better.” (RE13; Supermarket Owner)*

Participants did not think policies requiring them to promote smoking cessation to people purchasing tobacco, either by providing information such as leaflets, or handing out Quit Cards with each purchase, would be effective:

*“Oh, waste of time. Um...how long do you do it for? You keep doing it to every customer every time they come in every week?... existing smokers have been smoking so long... generally they know it’s probably not good for them.” (RE17; Supermarket Owner)*

While retailers were supportive of assisting people to quit smoking in theory, they tended to place more emphasis on preventing youth uptake and many were cynical of policies aimed at promoting cessation products and services.

### ***Tobacco industry***

Participants were asked about the nature of contact they had with industry representatives (reps) and how they decided which brands to stock. The majority reported having frequent contact with tobacco industry reps, via weekly telephone calls or monthly visits when reps checked that products were positioned correctly in cabinets, replaced expired stock, and promoted new products to the retailers. When asked what they had heard about plain packaging, several participants reported that reps discussed this policy during their visits. Participants’ views on plain packaging of tobacco products strongly suggested that they had received incorrect information about the policy impact in Australia:

*“I know that the government are looking at it. We hear that...from media and also through... the tobacco companies’ reps. From all accounts in Australia, it hasn’t made one iota of difference. So, it’s been trialled in a country that’s close to New Zealand... and from all accounts, according to the tobacco companies which will be the same, I imagine they’re worldwide tobacco companies, um, yeah, it didn’t make a scrap of difference. Going dark hasn’t made a scrap of difference.” (RE13; Supermarket Owner)*

Most participants reported that they had a rebate agreement with the industry where they earned more profit for stocking particular brands and placing them in certain positions within the display cupboard, even in the presence of the POS display ban. They also described tobacco industry activities in relation to the pricing of tobacco: several participants reported that the industry regularly introduced supplier price increases several times a year, whilst another participant noted:

*“When they introduced the tax increase on the 1st of January...I ran it through the system and... all the cheaper brands hadn't gone up. They hadn't picked up the tax increase... the cigarette companies...took the hit on the tax increase on the cheaper brands but gave all the tax increase to their branded products.” (RE9; Supermarket Manager)*

The retailers interviewed had a considerable amount of contact with industry reps on a regular basis and provided insights into some of the marketing tactics used, and the fact that reps appeared to try and shape retailers' views on tobacco control policies.

## Discussion

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Political decisions on tobacco control policy are subject to many influences, including stakeholder opinions (Bulmer, Coates, Dominian, & Duncan, 2007). As a key stakeholder group, retailers' views may influence both the introduction and the form of tobacco retail policies, therefore, understanding their perspectives on policies that impact on them is important. This research builds on previous NZ work (Jaine et al., 2014) and offers an in-depth analysis of retailers' views on licensing and policy options that could reduce the retail availability of tobacco.

The findings indicate that tobacco retailers have varying views on how the sale of tobacco should be regulated. Industry-backed organisations such as NZACS claim that tobacco control policies would likely drive small retailers out of business (Mason, 2013). By contrast, this study suggests retailers would be unlikely to strongly oppose a licensing scheme, as many thought they would be relatively unaffected by such a policy. Licensing schemes have been found to contribute to a reduction in the number of tobacco outlets (Coxe, et al., 2014; Bowden et al, 2014). Our results go some way to supporting this possibility, since many participants found the prospect of an application process unattractive and their decision to apply for a licence to sell tobacco would depend on the fee set. Participants generally supported reducing the retail availability of tobacco, and some held strong anti-tobacco views. Consistent with previous research (Whyte, et al., 2013), there was considerable support for restricting the sale of tobacco around school zones to protect children from starting smoking, though participants did not support policies that would restrict the sale of tobacco at certain types of outlet. Because restricting tobacco sales around schools appears to be more acceptable to stakeholders and has strong public support (Whyte, et al., 2013), adopting this measure could reduce tobacco retailer density but would need to be managed to ensure outlet density did not increase in other areas. One management tool could be to use a 'sinking lid' policy for tobacco retail licences, based on a quota system (Wilson, Thomson, Edwards, & Blakely, 2013), similar to the preferred approach by tobacco control experts in Chapter 4. Under such a scheme, licences held by retailers who stop selling tobacco (or by businesses that cease trading or move premises) would lapse and not become available to other traders, thus gradually



reducing the number of licences available. However, as noted in Chapter 2, some researchers have begun to argue that reducing the density of tobacco outlets in a community overall would be a more effective tobacco control strategy than solely reducing the density of outlets around schools (e.g. Shortt et al., 2016).

A strength of the in-depth interview approach is that it provides detailed insights into retailers' attitudes, and the factors underpinning those attitudes. This information has important implications for how policies are framed and communicated. While some retailers' views were consistent with a "market-justice" ideology, characterised by self-interest, individual responsibility, and freedom from intervention (Beauchamp, 1976), others expressed values that align with public health goals. Framing policy options on the basis of these shared values may elicit greater support from groups that feel disadvantaged by those measures (Dorfman, Wallack, & Woodruff, 2005). Participants showed a high level of concern for the wellbeing of children, consequently, framing policies in terms of protecting young people from tobacco may foster greater support and help counter perceptions that government intervention is simply a revenue-raising exercise.

The fact that the POS display ban was seen as ineffective suggests there is scope for education of tobacco retailers around tobacco control policy aims and the effectiveness of recently introduced measures. Participants believed that the intended impact of the display ban was a short-term change in smoking prevalence; emphasising the long-term goal of denormalising tobacco might promote wider understanding of public health objectives. Other perceptions that could be countered by retailer education (an activity regularly carried out by SEOs throughout NZ) include views framing smoking as a 'choice', and the widespread misunderstanding of the 2025 goal. Participants' beliefs that the 2025 goal meant a complete ban on smoking is consistent with previous research (Gendall, Hoek, & Edwards, 2013) and is likely to account for the common view that the goal is not viable. The 2025 smokefree goal is widely understood by those working in tobacco control in NZ to mean a reduction in the prevalence of smoking to less than 5% across all population groups (Gendall, et al., 2013). Clarifying these perceptions is important as retailers may be less likely to support policies they think aim to ban tobacco in NZ. The general public show stronger support for the 2025

goal when given an accurate explanation of the goal (Gendall, et al., 2013). A mass media campaign to promote understanding and support for the 2025 vision (Edwards, Hoek, & van der Deen, 2014), could influence stakeholders' views on tobacco retailing policies as well as improving understanding of the goal itself.

Retailers' ambivalence towards selling tobacco suggests health promoters and community members have an opportunity to support local retailers to become tobacco-free. Encouraging retailers to stop selling tobacco is an initiative gaining momentum overseas (McDaniel & Malone, 2011, 2014) and in NZ (Rowse & Callaghan, 2014); in theory, this approach could offer a promising alternative to regulation. For example, one of our participants reported that his business was currently in the process of gradually moving out of tobacco sales. However, recent research from Australia suggests that very few tobacco retailers cease selling tobacco voluntarily, which indicates a need for government regulation to achieve meaningful reductions in outlet density (Feletto et al., 2016). Previous NZ research has suggested that tobacco retailers may be willing to play a role in promoting smoking cessation (Guthrie et al., 2015; Jaine et al., 2014). However, participants in the present study did not think providing information on quitting would be effective, nor did they have positive experiences of trying to sell NRT in their outlets. However, making NRT available at lower prices than tobacco has not been tested and merits attention.

Lastly, although it was not the focus of this research, these findings provide insights into relationships between the tobacco industry and tobacco retailers. Industry reps reportedly paid regular visits to participants, and participants' comments suggested they had not received complete information about the impact of plain packaging legislation in Australia. This is consistent with U.S. research which indicates that the tobacco industry is a much more prominent source of information for retailers, compared to government agencies (Rose et al., 2015). The time and resources that reps are able to invest in maintaining relationships with tobacco retailers are in direct contrast to the resources SEOs and other public health professionals can invest. Since retailers' opinions will be strongly shaped by industry communications, it is crucial that they have access to accurate information about the intentions and public health benefits of proposed policies.

Our study has some limitations. The sample may have comprised people particularly motivated to talk about tobacco regulation. However, since many participants expressed indifference towards regulation we do not feel that the sample was especially opinionated in this regard. Owners and managers of small independent businesses were more likely to agree to take part in the study than large chain stores, though the category-based quotas ensured we obtained a broad range of participants. One important limitation is that we did not systematically collect data on the location of participants' tobacco retail outlets, and it is possible that retailers' views towards some policies, for instance prohibiting tobacco sales around schools, would be affected by their location in relation to a school. A limitation with all qualitative research is that the views and beliefs of the researchers invariably influence the study process, from conceptualisation, interaction with participants, and data interpretation (Kuper et al., 2008).

To conclude, the tobacco retailers in this study held varied views on regulating the sale of tobacco. Given our efforts to recruit diverse participants, the differing views elicited suggest that blanket opposition towards licensing amongst retailers is unlikely. Those involved in tobacco control advocacy and retailer education should consider emphasising the long-term benefits of licensing in terms of protecting children and young people from smoking, as this approach is likely to elicit greater policy support.

The final group of stakeholders whose views have been examined in this thesis are smokers. In the following chapter, a quantitative survey was used to estimate perceptions of the effect of various policies on smoking behaviour.

## **Chapter 6 – Smokers' perceptions of the relative effectiveness of five tobacco retail reduction policies**

## Introduction

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The evidence summarised in this thesis highlights the need for policy measures that reduce the availability of tobacco. Researchers have proposed several different approaches to reduce the availability of tobacco, and several jurisdictions have begun to adopt various policies to achieve this reduction. However, we know little about how effectively different policy options could reduce smoking prevalence. Since NZ has a goal of becoming a smokefree nation by 2025, the most effective endgame strategies to reach this goal will be those that contribute both to reducing smoking initiation and smoking cessation. Only two studies have compared the effects of different policy approaches to reduce tobacco outlet density. One of these, based in North Carolina (U.S.), found that regulating the minimum allowable distance between tobacco retailers to 500 feet would reduce tobacco outlet density to a greater effect than prohibiting tobacco sales at pharmacies, or within 1000 feet of schools (Myers, Hall, Isgett & Ribisl, 2015). While these findings will be valuable to tobacco control advocates in North Carolina and elsewhere in the U.S., they have limited relevance to NZ given the differences in the tobacco retail environments between the U.S. and NZ. A NZ economic modelling study compared several different policy interventions, both in terms of effect on outlet density and impact on smoking prevalence by the year 2025 (Pearson et al., 2015). The interventions compared were: i) a reduction in total number of tobacco outlets by 95%; ii) only allowing tobacco sales at half the existing liquor stores (and nowhere else), iii) eliminating tobacco sales within a 1km radius of schools, and iv) eliminating tobacco sales within 2km of schools. Based on economic modelling, the intervention that permitted tobacco sales only at half of liquor stores resulted in an approximate 90% reduction in outlet density, and the lowest smoking prevalence (9.1%) by 2025.

To our knowledge, no studies have examined smokers' beliefs about the effect of policies aimed at reducing tobacco availability on smoking. Smokers are likely to provide more valid estimates of policies' effects on smoking behaviour, compared to the general public (the majority of whom may never have smoked regularly). We therefore assessed how effective smokers perceived five different potential tobacco

retail reduction policies to be, relative to a benchmark policy of a 10% tobacco tax increase (a policy that has been implemented annually in NZ since 2010).

## Methods

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### Survey conceptualisation

We aimed to conduct an innovative study with a randomised design that would enable comparisons of the relative effectiveness of different policies. The survey design was developed specifically for this project, though drew in part on the experimental virtual store study described in Chapter 3 (Kim, Nonnemaker et al., 2013).

### Survey development

The five policy scenarios examined were chosen based on literature on proposed retail reduction policies (Marsh et al., 2013; Pearson et al., 2015; Tilson, 2011; van der Deen et al., 2014) and through consultation with NZ tobacco control experts. The literature suggested three policies would reduce tobacco outlet density by around 90-95% (tobacco sold only at half the existing liquor stores; no tobacco sales within 1km of a school, and tobacco sold only at pharmacies; see Table 13). The remaining two policies would have more modest effects on tobacco outlet density (around 13%) but would provide greater protection to vulnerable groups or groups in high-risk settings (no tobacco sales within 500m of a high school; no tobacco sales at alcohol on-licensed premises e.g. bars and nightclubs). We also included a benchmark scenario of continued annual 10% tax increases, and compared the perceived effectiveness of each of the retail reduction policies to this evidence-based policy. This benchmark was chosen as it both deters youth initiation and supports cessation (Chaloupka, Yurekli, & Fong, 2012).

The online survey was created using Qualtrics, and was pre-tested with five current smokers, recruited through LR's personal networks. After the pre-testing, the wording of the policy scenarios was edited so these were easier to understand, and as standardised as possible. After these modifications, the survey was piloted with a sub-sample of participants ( $n=109$ ) recruited through ResearchNow, an online panel provider.

Table 13. Study conditions

<b>Condition (reduction in outlet density)</b>	<b>Policy descriptor</b>	<b>Policy scenario as presented in survey</b>
A (n/a)	10% tobacco tax increase	Since 2010, the price of tobacco has been increased each year, on average by about 10%. If this policy continued next year, it would mean the price of 20 budget brand cigarettes would go up from around \$16 to \$17.60, a pack of premium brand cigarettes would go up from around \$20 to \$22, and a pack of 30g loose tobacco would go up from around \$40 to \$44.
B (13%)	No tobacco sales at alcohol on-licensed premises	Currently in New Zealand, tobacco can be sold anywhere. This policy could be changed so that bars, pubs, taverns or nightclubs were not allowed to sell tobacco. It would mean people going to pubs, taverns or nightclubs would not be able to buy tobacco there. The number of businesses selling tobacco in New Zealand would reduce from around 8,000 to around 7,000. For example, for a city of 100,000 people the number of places selling tobacco would reduce from around 150 to about 130.
C (13%)	No tobacco sales within 500m of a <u>high</u> school	Currently in New Zealand, tobacco can be sold anywhere. This policy could be changed so that no stores within 500 metres (0.5km) of a high school could sell tobacco. It would mean there would be nowhere to buy tobacco within a 5 minute walk of a high school. The number of businesses selling tobacco in New Zealand would reduce from around 8,000 to around 7,000. For example, for a city of 100,000 people the number of places selling tobacco would reduce from around 150 to about 130.
D (88%)	Tobacco sales only at pharmacies (and nowhere else)	Currently in New Zealand, tobacco can be sold anywhere. This policy could be changed so that only pharmacies were allowed to sell tobacco. It would mean that people buying tobacco could receive free advice and low-cost products from the pharmacist, to help them quit smoking. The number of businesses selling tobacco in New Zealand would reduce from around 8,000 to around 1,000 in total. For example, for a city of 100,000 people, the number of places selling tobacco would reduce from around 150 to about 19.
E (89%)	No tobacco sales within 1km of <u>any</u> school	Currently in New Zealand, tobacco can be sold anywhere. This policy could be changed so that no stores within 1000 metres (1km) of a school could sell tobacco. It would mean there would be nowhere to buy tobacco within a 10 minute walk of a school. The number of businesses selling tobacco in New Zealand would reduce from around 8,000 to around 850. For example, for a city of 100,000 people the number of places selling tobacco would reduce from around 150 to about 16.
F (95%)	Tobacco sales only at half existing liquor stores (and nowhere else)	Currently in New Zealand, tobacco can be sold anywhere. This policy could be changed so that dairies, supermarkets, petrol stations and convenience stores were not allowed to sell tobacco. Instead, tobacco would only be sold at half of the existing liquor stores, and children younger than 18 years old would not be allowed to enter the stores. The number of businesses selling tobacco in New Zealand would reduce from around 8,000 to around 400. For example, for a city of 100,000 people the number of places selling tobacco would reduce from around 150 to about 8.



## **Sample**

The intended sample size was 630 participants; current smokers aged 18 years or older were eligible to take part. ResearchNow provided the sample from its online panel; members are recruited through email and other media advertising, and receive financial rewards in exchange for participating in surveys. Current smokers were selected since we considered they would offer more personal and valid insights than a general population sample into the effects of the policies examined.

## **Procedure**

After receiving an email inviting them to take part in a survey, participants could click a link to take them to the study information sheet (Appendix 11). Those who chose to continue and complete the survey were randomly allocated to one of six conditions (refer Figure 9) where they read their assigned policy scenario. Each condition had approximately the same number of respondents. Participants then saw a vignette describing either a 15-year-old susceptible never-smoker (“Rose”) or an adult smoker (“Anna”), and were asked three questions assessing their perceptions of the particular policy’s impact on that person (see Table 14). For the susceptible never-smoker, the three questions probed the likelihood that the policy would affect the never-smoker’s chances of i) being offered a cigarette, ii) trying a cigarette and iii) becoming a regular smoker. For the adult smoker, the questions probed the likelihood that the policy would affect the smoker’s chances of i) cutting down on smoking, ii) making a quit attempt and iii) maintaining abstinence after a quit attempt. Each participant answered all three questions for both vignettes, and the vignettes were presented in a randomised order. After assessing how the policy would affect the vignette character, participants estimated how the policy would affect their own smoking patterns. Full details of the questions and response options are provided in Appendix 12.

Table 14. Vignettes and main outcome measures

<p><b>“Rose”, susceptible never-smoker</b></p> <p>Rose is 15 years old and lives with her parents and two sisters. She goes to a high school in a neighbourhood close to her home and enjoys listening to music and socialising with her friends in her spare time. Some of her friends smoke cigarettes. Rose has never tried smoking before, but her friends keep offering her cigarettes. She thinks she will probably try one sometime soon.</p> <p>a) How would this policy affect Rose’s chances of being offered a cigarette? b) How would it affect Rose’s chances of trying a cigarette? c) How would this policy affect Rose’s chances of becoming a regular smoker?</p> <p>Response options: 1 = It wouldn’t make a difference 2 = She’d be a little less likely to... 3 = She’d be somewhat less likely to... 4 = She’d be much less likely to...</p>
<p><b>“Anna”, adult smoker</b></p> <p>Anna is 35 years old and lives with her husband and two children. She works part-time in a cafe in a neighbourhood close to her home. Anna started smoking when she was a teenager and she now smokes around 20 cigarettes a day. She usually goes drinking with friends at a local bar once a week, and when she does this she tends to smoke a lot more. She wishes she had never started smoking, and would really like to quit.</p> <p>a) How would this policy affect Anna’s chances of cutting down on smoking? b) How would it affect Anna’s chances of making a quit attempt? c) If Anna did quit successfully, how would the policy affect her chances of staying smokefree?</p> <p>Response options: 1 = It wouldn’t make a difference 2 = She’d be a little more likely to... 3 = She’d be somewhat more likely to... 4 = She’d be much more likely to...</p>

The remaining questions examined respondents’ smoking and quitting-related behaviours, tobacco purchasing patterns, their awareness and perceptions of the Government’s smokefree 2025 goal, and demographic attributes. Questions about respondents’ own smoking behaviours were used to calculate their Heaviness of Smoking Index (Borland, Yong, O’Connor, Hyland, & Thompson, 2010).

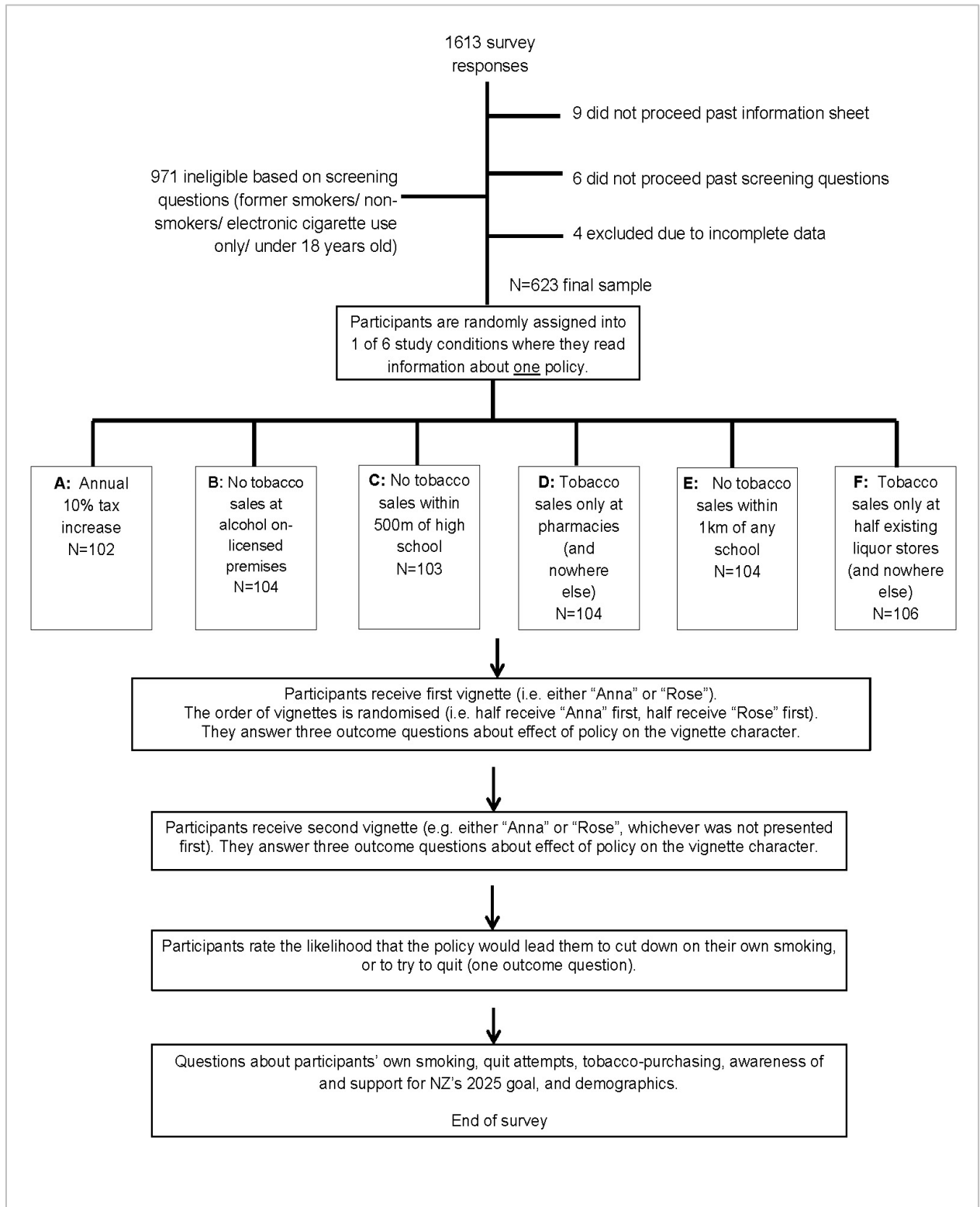
### **Main statistical analyses**

Participants' mean responses to the three main outcome questions (Table 14) were calculated for each study condition subgroup; this task was completed separately for each vignette. We thus obtained a separate "effectiveness" score for each of the 12 possible policy-vignette combinations. The effectiveness score for a policy in relation to the susceptible never-smoker ("Rose") indicates the degree to which the policy may prevent youth uptake of smoking. By contrast, the "effectiveness" score for a policy in relation to the adult smoker ("Anna") reflects the extent to which the policy may support quitting. Pooled t-tests were used to examine differences between the effectiveness scores for each of the five retail reduction policy scenarios and the benchmark policy; these analyses were performed separately for the two vignettes.

### **Supplementary statistical analyses**

We also created a binary effectiveness score by coding mean responses of 2 or more as "effective" and mean responses less than 2 as "not effective" (the possible range of mean scores was 1 to 4). We used these scores as a summary of all policy scenarios in relation to the two vignettes and of participants' assessment of the policy's effect on their own smoking. Multiple logistic regression was used to examine whether any participant characteristics systematically predicted the perceived effectiveness of a particular vignette-policy combination. Predictors included age group, gender, ethnicity, education, quit attempt made in past six months, heaviness of smoking, frequency of purchasing tobacco, and support for 2025 goal. Twelve separate models were included, one for each policy-vignette combination.

Figure 9. Study procedure



## Results

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### Characteristics of participants

ResearchNow sent a total of 9,500 invitations to participate in the study. The data collection was stopped and the survey closed after our intended quota of N=630 was achieved; this occurred within one week of the initial mailout. After excluding respondents who did not complete the survey in full (see Figure 9), the final sample was N=623.

Table 15 summarises respondents' characteristics and shows each sub-sample had similar demographic and smoking characteristics. The majority of study participants were female, NZ European, aged 35 – 54 years-old and tended to be daily smokers. When compared to individuals who were sent the survey link by ResearchNow but did not participate, those who completed the survey were more likely to be male (46% vs 40%) and less likely to be aged 55 or older (29% vs 39%). When compared to the general population of smokers in NZ, the final sample was older, contained fewer males and fewer Māori and Pacific people (Ministry of Health, 2014a). Survey participants tended to buy their tobacco primarily from dairies and supermarkets; 35.5% reported *always* or *usually* purchasing tobacco from supermarkets; 37.3% *always* or *usually* purchased tobacco from dairies, and 21% typically purchased tobacco from service stations. By contrast, 88% reported that they *rarely* or *never* purchased tobacco from alcohol on-licensed premises, 79.3% *rarely* or *never* purchased tobacco from liquor stores and 71.3% *rarely* or *never* purchased tobacco from tobacconists. Most participants (64.5%) had heard of the government's 2025 smokefree goal, and 40% of participants said they supported the goal.

Table 15. Key participant characteristics, for the whole sample, and by condition

Characteristic	Total (n=623)	Policy condition					
		A – 10% tobacco tax increase (N=102)	B - No sales at on-licensed premises (N=104)	C - No tobacco sales within 500m of high school (N=103)	D - Tobacco only sold at pharmacies (N=104)	E - No tobacco sales within 1km of any school (N=104)	F - Tobacco only sold at half existing liquor stores (N=106)
Male, %	<b>45.6</b>	42.1	47.1	47.6	43.3	47.1	46.2
Age, %							
18-34 yrs	<b>29.4</b>	25.5	27.9	34.0	31.7	26.9	30.2
35-54 yrs	<b>41.7</b>	41.2	42.3	47.6	38.5	46.2	34.9
55 and over	<b>28.9</b>	33.3	29.8	18.4	29.8	26.9	34.9
Ethnicity, %							
NZ European	<b>69.8</b>	74.5	70.2	73.8	66.3	63.1	71.7
Māori	<b>10.3</b>	4.9	9.6	9.7	16.4	15.5	5.7
Asian	<b>9.5</b>	10.8	10.6	7.8	7.7	10.7	9.4
European	<b>4.5</b>	2.0	5.8	4.9	3.8	3.9	6.6
Pacific Island	<b>2.7</b>	2.9	1.9	1.9	1.9	3.9	3.8
Other (includes n=3 unknown)	<b>3.2</b>	4.9	1.9	1.9	2.9	2.9	2.8
Highest educational qualification, %							
None	<b>13.8</b>	17.6	11.5	12.5	10.6	12.5	17.9
School qualification	<b>25.5</b>	30.4	20.2	26.2	25.0	24.0	27.4
Certificate or equivalent	<b>29.7</b>	27.5	36.5	24.3	34.6	31.7	23.6
Bachelor degree	<b>22.3</b>	15.7	25.0	24.3	20.2	23.1	25.5
Postgraduate degree	<b>8.7</b>	8.8	6.7	12.6	9.6	8.7	5.7
Daily tobacco smoker, %	<b>70.3</b>	64.7	78.8	62.1	74.0	68.3	73.6
Heaviness of smoking index, %							
Light	<b>40.4</b>	45.1	34.6	52.4	38.5	35.6	36.8
Moderate	<b>42.4</b>	38.2	42.3	37.9	48.1	48.1	39.6
Heavy	<b>17.2</b>	16.7	23.1	9.7	13.4	16.3	23.6
Smokes mainly manufactured cigarettes, %	<b>52.8</b>	52.0	52.9	52.4	50.0	52.9	56.6
Buys tobacco at least weekly, %	<b>71.0</b>	66.7	77.9	63.1	74.0	72.1	71.7
1 or more quit attempt in past 6 months, %	<b>45.4</b>	47.1	45.2	43.7	41.3	50.0	45.3
Supports 2025 goal, %	<b>40.0</b>	45.1	38.5	40.8	39.4	36.5	39.6

## Main analyses

Descriptive statistics showing the perceived effectiveness of each policy scenario for each vignette, and on participants' own smoking, are shown in Table 16. Mean effectiveness scores for each vignette are also presented in Table 16, along with the results of the t-tests comparing each policy score with the benchmark policy score.

The two policy scenarios rated as most likely to reduce smoking uptake were allowing tobacco to be sold only at half the existing liquor stores and allowing tobacco to be sold only at pharmacies. The mean effectiveness scores for these policies were significantly higher than the mean for the benchmark policy of 10% tobacco tax increases (both  $p < 0.05$ ). There was no significant difference between the effectiveness scores for not allowing tobacco sales within 1km of a school, and not allowing tobacco sales within 500m of a high school and the benchmark ( $p = 0.20$  and  $p = 0.23$ , respectively). Not allowing tobacco sales at alcohol on-licensed premises scored significantly lower than the benchmark ( $p = 0.01$ ).

The two policy scenarios considered most effective at preventing initiation also had the highest scores with respect to supporting cessation. However, with respect to supporting cessation, the mean effectiveness scores for these two policies (i.e. allowing tobacco to be sold only at half the existing liquor stores and allowing tobacco to be sold only at pharmacies) were not significantly different to the benchmark of tax increases ( $p = 0.73$  and  $p = 0.20$ , respectively). There was no significant difference between the effectiveness score for not allowing tobacco sales within 1km of a school, and that of the benchmark ( $p = 0.13$ ). The two scenarios of not allowing tobacco sales within 500m of a high school, or at alcohol on-licensed premises were each rated less effective as a tax increase in supporting cessation.

Participants' perceptions of how their particular policy scenario would affect their own smoking followed a similar, though not identical, pattern to the results for the adult smoker: allowing tobacco to be sold only at half the existing liquor stores and allowing tobacco to be sold only at pharmacies received the highest effectiveness scores of the

five policies tested, although these were not statistically significantly different to the score for the benchmark policy ( $p=0.35$  and  $p=0.65$ , respectively). No tobacco sales within 500m of a high school and no tobacco sales at alcohol on-licensed premises were rated significantly less effective than the benchmark ( $p<0.001$  in both cases).

### **Supplementary analyses**

The logistic regression models provided no evidence that any participant characteristics were systematically associated with perceived effectiveness of a particular vignette-policy combination (see Appendices 13 and 14).



Table 16. Descriptive statistics showing smokers' perceived effectiveness of policies, by smoker vignette and on participants own smoking behaviour

Study condition (resulting % in tobacco outlet density)	N for study condition	Proportion of participants who perceived their assigned policy to be effective †			Effectiveness scores for each policy ‡		
		"Rose", susceptible never-smoker, %	"Anna", adult smoker, %	Participant's own smoking, %	"Rose", susceptible never-smoker, mean (SD)	"Anna", adult smoker, mean (SD)	Participants' own smoking, mean (SD)
A: 10% tobacco tax increase (benchmark policy, n/a)	102	41.2 (n=42)	59.8 (n=61)	57.8 (n=59)	1.81 (0.89)	2.08 (0.82)	2.06 (1.12)
B: No tobacco sales at alcohol on-licensed premises (13%)	104	29.8 (n=31)	47.1 (n=49)	28.8 (n=30)	1.52^ (0.78)	1.82^ (0.67)	1.38^ (0.67)
C: No tobacco sales within 500m of a <u>high</u> school (13%)	103	36.9 (n=38)	33.0 (n=34)	27.2 (n=28)	1.66 (0.76)	1.53^ (0.66)	1.45^ (0.84)
D: Tobacco sales only at pharmacies and nowhere else (88%)	104	58.7 (n=61)	62.5 (n=65)	56.7 (n=59)	2.32* (1.07)	2.24 (0.96)	1.99 (1.07)
E: No tobacco sales within 1km of <u>any</u> school (89%)	104	50.0 (n=52)	49.0 (n=51)	45.2 (n=47)	1.96 (0.91)	1.91 (0.80)	1.89 (0.97)
F: Tobacco sales only at half existing liquor stores and nowhere else (95%)	106	63.2 (n=67)	65.1 (n=69)	53.8 (n=57)	2.30* (1.02)	2.12 (0.87)	1.92 (1.04)

† Proportions were calculated within each study condition. Policies categorised as "effective" were those with a mean score  $\geq 2$ .

‡ The effectiveness score for a policy in relation to the susceptible never-smoker "Rose" indicates the degree to which the policy may prevent youth uptake of smoking. Whereas the "effectiveness" score for a policy in relation to the adult smoker "Anna" reflects the extent to which the policy may support quitting. Mean scores range from 1 to 4, where 1 = policy "would make no difference" and 4 = policy would be "much more likely" to prevent smoking/ supporting quitting.

T-tests were performed within each vignette (i.e. within each column):

\* Indicates score was statistically significantly higher than the score for benchmark policy A at  $\alpha=0.05$ .

^ Indicates score was statistically significantly lower than the score for benchmark policy A at  $\alpha=0.05$

## Discussion

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This study assessed NZ smokers' perceptions of five potential tobacco retail reduction policies; the two rated most likely to reduce smoking were allowing tobacco to be sold only at half the existing liquor stores (and nowhere else), and allowing tobacco to be sold only at pharmacies (and nowhere else). Both of these policies were rated more likely to prevent youth smoking initiation, and at least as likely to support smokers to quit, compared to a benchmark policy of a 10% tobacco tax increase. This is an important finding given the strong evidence that tobacco taxation is a powerful tool to prevent potential users from starting tobacco use and to encourage current smokers to stop using tobacco (Chaloupka et al., 2012). Our study therefore supports calls for endgame strategies that substantially reduce the number of tobacco retail outlets, and suggests that such measures could be effective both in preventing smoking initiation and supporting smoking cessation.

The three scenarios we presented that would result in large reductions in tobacco retail outlet density were rated more likely to be effective – for both outcomes of interest – than the two scenarios resulting in modest reductions in outlet density. Therefore, smokers appear to consider policies that significantly reduce the availability of tobacco to be more effective than standalone location-based policies aimed at high-risk settings, such as not allowing tobacco sales at alcohol on-licensed premises or within 500m of a high school. These findings were consistent with the expected effects based on the research evidence linking availability and tobacco use (e.g. Cantrell et al., 2015; Chan & Leatherdale, 2011; Henriksen, 2012) and the internal consistency (i.e., that each of the three policies resulting in large outlet density reductions were rated most effective) provides some validation of the scenarios we tested.

It was somewhat surprising that prohibiting tobacco sales within 1km of any school was not rated more highly, given that policies aimed at restricting tobacco availability around schools appear to be the most acceptable retail reduction policies amongst the general public and smokers (Edwards et al., 2012; Whyte et al., 2014). A possible reason why measures that would only allow tobacco sales at half the existing liquor stores, and at pharmacies were considered more effective than prohibiting tobacco

sales within 1km of any school, is that these policies would remove tobacco from smokers' usual place of purchase. The usual outlets from which smokers purchase tobacco are supermarkets, convenience stores/ dairies and service stations (Paul et al., 2010). These are outlets that the general public visit or come into proximity with on a frequent basis. Therefore, it is possible that removing tobacco from these stores would eliminate an important environmental cue for smoking and tobacco-purchasing for smokers attempting to quit (Burton et al., 2015). The presence of a tobacco retail outlet can itself trigger cravings and impulse purchases of tobacco among people trying to quit (Burton et al., 2015) and evidence from Australia suggests that relapse-related tobacco purchases typically occur in the same tobacco outlets from which smokers usually purchased tobacco – specifically, service stations, supermarkets, and convenience stores (Paul et al., 2010). By contrast, very few smokers usually buy tobacco from liquor stores. In the current study, only 4% of participants reported that they “*always*” or “*usually*” purchased tobacco from on-licensed stores; Australian data are highly consistent with this estimate (Paul et al., 2010). Removing tobacco from smokers' usual purchase outlets could thus support quitting, and may also remove cues to purchase by susceptible never-smoking youth. In the present study, smokers who had made a recent quit attempt were more likely to view allowing tobacco sales only at half the existing liquor stores as effective in supporting cessation; this could reflect their own experience of impulse purchasing when in everyday outlets that sell tobacco.

Further research could examine settings in which relapse occurs, and the effect of tobacco availability on cessation attempts. Future studies could also examine the perceived effectiveness of these policies on occasional or non-daily adult smokers, as this pattern of tobacco use has been predicted to increase globally (Schane, Glantz, & Ling, 2009). Given the link between alcohol use and intermittent smoking, it is possible that the policy of not allowing tobacco sales at alcohol on-licensed premises may be perceived differently in relation to the behaviour of social smokers.

Like all studies, this work has some limitations. The use of an online panel rather than a sample drawn from the population of NZ smokers limits the generalisability of our findings. However, no alternative sampling frame would have enabled data collection from such a large national sample of smokers. Non-response bias is possible in any

survey with less than a 100% response rate, but it is not inevitable, even with a low response rate. We aimed to compare the relative effectiveness of five different policies, and since we randomised participants into each condition, any non-response bias should be evenly distributed across each scenario. Another limitation is that the outcome measures only examined perceptions and it is not known whether these perceptions accurately correspond to behaviour. The effectiveness scores for each retail reduction scenario were modest, yet this was also true for the continued tobacco taxation scenario and could reflect the fact that smokers who have tried and failed to quit previously (at least 45% in the current study) are more pessimistic about the effectiveness of policy interventions. Furthermore, smokers' perceptions of policy effectiveness may be conservative, given that the contribution of retail reduction policies to de-normalising tobacco over the long-term is perhaps unlikely to have been considered when participants formulated their assessments. Lastly, participants tended to rate the effect of policies as being greater on the adult smoker vignette than on their own smoking. However, this is consistent with the "third person effect" where people tend to underestimate the effects of media and advertising on themselves compared to others (Shin & Kim, 2011).

The evidence that some tobacco retail reduction policies are seen as more effective than taxation, or as similar in effect, is encouraging and further supports calls to restrict retail supply as a core component of endgame strategies. Our findings indicate that such policies are perceived by smokers as effective, both in terms of deterring initiation and supporting cessation. Overall, our findings suggest there could be wide benefit in introducing measures that dramatically reduce tobacco supply.

The final chapter offers a brief summary of the new knowledge that this thesis has brought about, and offers conclusions in relation to the overall aim of the thesis.

# Chapter 7 - Conclusions

## Summary and conclusions

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### Summary

The first part of this thesis involved a literature review (Chapter 2), which examined the accessibility of tobacco in NZ, the evidence linking tobacco availability to smoking outcomes, and potential policy options to regulate the tobacco retail environment. Greater access to tobacco retail outlets was found to be a significant risk factor for youth smoking initiation and for relapse after a cessation attempt. Multiple mechanisms could account for this association: the ease of accessing the product, perceived normalisation of tobacco, competition amongst local retailers, gaps in enforcement, greater exposure to POS tobacco promotion and increased environmental cues for smoking and impulse purchasing. Several overseas jurisdictions have implemented tobacco retailing policies, including licensing of tobacco retailers and restrictions on where tobacco can be sold.

Chapter 3 examined the association between exposure to POS tobacco promotion and smoking in greater detail. The systematic review identified 20 studies, each of which reported results consistent with a positive association between POS tobacco promotion and smoking. For children and young people, exposure to POS is associated with pro-smoking attitudes, smoking susceptibility, being a current smoker, ever-smoking and school smoking prevalence. The meta-analysis indicated that children frequently exposed to POS tobacco promotion have around 1.6 times the odds of having tried smoking and around 1.3 the odds of being susceptible to future smoking, compared to children less frequently exposed. For adult smokers, POS tobacco promotion is associated with greater smoking frequency, increased odds of impulse tobacco purchases, and reduced odds of successful abstinence after a quit attempt. Bans on POS tobacco display bans are associated with reduced rates of impulse purchasing, and contribute to tobacco denormalisation. In NZ, a ban on POS tobacco displays was enacted in 2012. Based on the results from this chapter, this legislation is likely to contribute to reduced smoking prevalence and the 2025 goal over the long-term.

In order to appraise what more could be done in NZ, Chapter 4 assessed the views of NZ tobacco control experts in relation to regulating the tobacco retail environment. This qualitative study indicated that NZ's tobacco control sector believe that licensing of tobacco retailers is an important intermediate step in achieving the 2025 goal, and envisage tobacco being available only at a small number of specialised outlets in the long-term. Participants believed that the 2025 goal was achievable, so long as the Government introduced new policies, including plain packaging, continued tax increases, and substantial reductions in tobacco outlet density.

Chapter 5 explored a sample of NZ tobacco retailers' views towards mandatory licensing of tobacco retailers, and towards policies that would reduce tobacco availability. This qualitative research found that tobacco retailers have varying views on whether tobacco sales should be regulated and how this outcome could be achieved. Around half of the study participants were positive or indifferent about mandatory retailer licensing, and several believed licensing would not have a large impact on them. The idea of restricting the sale of tobacco within 500m of a school was generally well received by participants, whereas policies that would prohibit certain outlet types from selling tobacco were opposed and seen as unfair. Retailers tended to be more supportive of tobacco retail policies where the rationale was to protect children from tobacco-related harm, and where this intention was explicit. In contrast to claims made by industry-related organisations that tobacco retail regulation will drive retailers out of business (Mason, 2013), a proposed licensing policy is unlikely to be met with blanket opposition from tobacco retailers.

Lastly, Chapter 6 assessed NZ smokers' perceptions of the relative effectiveness of five potential policies designed to reduce the retail supply of tobacco. Five different policies designed to reduce the retail supply of tobacco were identified based on existing literature, and a sixth policy of annual 10% tobacco tax increases was also included as a benchmark. Participants rated the likely effectiveness of one policy on preventing uptake by a 15-year-old susceptible never-smoker and supporting quitting by an adult smoker. Of the five policy options to reduce tobacco availability that were tested, two were perceived as most effective: i) tobacco only sold at half the existing liquor stores, and ii) tobacco only sold at pharmacies. Each of these policies was rated more likely to

prevent youth smoking initiation, and at least as likely to help smokers to quit, relative to the benchmark policy of continued tobacco taxation. Based on the perceptions of the policies' effects on the fictitious smokers, policies that substantially reduce tobacco availability and remove it from smokers' usual places of purchase are seen by smokers as at least as effective in reducing smoking as tax increases. Smokers' perceptions of the relative effectiveness of these policy options may help inform the advocacy efforts of the sector.

### **Implications**

Tobacco retail policies implemented in international jurisdictions are precedents on which NZ policies could be based. At the least restrictive end of the spectrum is mandatory negative licensing (i.e. registration) for tobacco retailers. This option would provide better information regarding who sells tobacco in NZ, and could enhance enforcement of existing legislation (Fry et al., 2016). It could also enable better communication between Government agencies and tobacco retailers. Positive licensing, however, would generate a greater range of benefits compared to negative licensing. Firstly, there would likely be some reduction in tobacco retailer numbers, due to unwillingness to apply for a licence (Bowden et al., 2014; Coxe et al., 2014). Secondly, the possibility of losing their licence may serve as an effective deterrent for breaching legislation, thus helping to prevent sales to minors. Thirdly, positive licensing would enable the Government to place restrictions on where tobacco could be sold (i.e. whether by outlet type or location, or both) and by whom (e.g. requiring all salespersons to be aged 18 or over, and to demonstrate understanding of the SFEAA). Restrictions to reduce the overall number of tobacco retail outlets in NZ are essential, given the evidence linking high tobacco availability to greater odds of smoking initiation and lower odds of successful smoking cessation. The Government's 2025 goal not only necessitates measures that reduce smoking prevalence, but explicitly encompasses a commitment to reducing "tobacco availability to minimal levels by 2025" (NZ Government, 2011).

This thesis explored the types of policy that could be introduced to reduce tobacco retail availability, and suggests that a number of different policies could be both



effective and acceptable to stakeholders. The tobacco control experts indicated that a 'sinking lid' policy was one possibility. While the details of this policy differed across participants, their views reflected a preference for a long-term and staged approach to reducing tobacco outlet density, which they saw as the most feasible and acceptable way to realise change. There are good examples of licensing models that will achieve a gradual reduction in tobacco retailer density in several jurisdictions in the U.S., where restrictions on tobacco retail licensing only apply to new retailers. In NZ, based on the tobacco control experts' views and those of tobacco retailers themselves, a sinking lid policy would be seen as more acceptable if it was implemented to apply equitably to tobacco retailers, and avoided basing eligibility for licences on outlet type. NZ tobacco control experts supported restricting tobacco sales around schools, and the tobacco retailers interviewed understood this policy and were relatively accepting of the idea. Smokers did not rate restricting tobacco sales within 1km of any school as the most effective policy, but around half perceived that it would be somewhat effective in preventing youth initiation and supporting quitting.

Other policies that appear promising are restricting tobacco sales to pharmacies, or to half the existing liquor stores. Smokers perceived each of these two policy options as the most likely to prevent smoking initiation and support quitting, of the six policy scenarios tested, and NZ tobacco control experts envisioned an endgame scenario in which tobacco was only available at pharmacies. Restricting tobacco sales to half the existing liquor stores was not discussed in the qualitative interviews with tobacco control experts, as the research that gave rise to this scenario was published only after most of the interviews had been completed (i.e. Pearson et al., 2015). This is a limitation of this thesis and could be the subject of further research.

As with many tobacco control policies, the main barrier to policy adoption is political acceptability. In NZ's current political climate, with an apparent lack of Government leadership for tobacco control, it is unsurprising that the tobacco control sector were pessimistic about achieving the 2025 goal. However, the NZ Prime Minister John Key has recently expressed commitment to implementing plain packaging of tobacco products (Kirk, 2016), which will undoubtedly help towards achieving the 2025 goal. Paradoxically, this could mean that some measures such as tobacco retailer licensing

are not progressed further in the short to medium term; many of the tobacco control experts interviewed expressed uncertainty about the number of measures that could realistically be adopted at one time. Nonetheless, there is considerable evidence of public support in NZ. A study by Edwards et al. (2012) reviewed the evidence of the NZ public's support for tobacco retail reduction policies and summarised several surveys, including the International Tobacco Control Survey NZ arm 2009/10 (comprising adult smokers only), the Year 10 In-depth Survey 2008 (14-15 year olds), the National Health and Lifestyle Survey 2008 and 2010 (15 year olds and above), and the ASH Year 10 Snapshot Survey 2009 (14-15 year olds) (Edwards et al., 2012). Four of the surveys assessed support for reducing the number of tobacco retail outlets, and each one found that the majority of the public supported this measure (ranging from 55% for adult smokers to 67% in an adult general population sample). The review also indicated there was majority support for restricting tobacco sales to dedicated outlets where children are not allowed to go, for selling tobacco products only in special places where cessation products are also sold, with the highest support among Māori and Pacific people (Edwards et al., 2012). More recently, non-smokers, former smokers and occasional smokers have also been found to support licensing of tobacco retailers and prohibiting the sale of tobacco around schools (Whyte et al., 2014).

### **Future research**

This thesis has identified several areas for future research. Firstly, there is an overall lack of evidence linking tobacco retail availability with smoking cessation outcomes and no NZ studies have yet been conducted in this area. This gap will be addressed, at least in part, by a project currently being led by LR that will examine whether greater access to tobacco retail outlets around the home and the workplace is associated with smoking status six months after a quit attempt. This will be achieved through mapping the home and workplace addresses of a sample of "attempting quitters" (recruited through NZ's Quitline service), in relation to a Geographic Information System database of tobacco retail outlets compiled in an earlier study (Marsh et al., 2012). However, that project could be supplemented by other research methodologies. In particular, a diary-style study or an ecological momentary assessment study would provide valuable 'real-time' data on the environmental factors that trigger relapse after a cessation

attempt. A study of this nature would provide evidence as to the importance – or otherwise – of reducing tobacco outlet density in NZ as a means to supporting smoking cessation.

As noted earlier, further research could also explore the views of NZ's tobacco control sector in relation to restricting tobacco sales to half the existing liquor stores. It would be important to explore the tobacco control sector's views towards this policy in particular, since smokers perceive the idea as effective yet researchers have called for policies aimed at breaking the association between the two substances (e.g. Whyte et al., 2014; Marsh et al., 2016). Additionally, there are no data about the extent to which the NZ public supports the measures that smokers rated most likely to prevent smoking initiation and support quitting. Therefore, future research could assess the level of public support for the two policy options of i) tobacco sales at pharmacies only, and ii) tobacco sales at half the existing liquor stores only. The qualitative work with tobacco retailers indicated that support for a policy may be influenced by the way in which its purpose is framed. As such, a possible area for future research would be experimental research with stakeholder groups, testing whether support for policy options varies according to the way in which that policy is described. This could help inform the media advocacy efforts of those working in tobacco control in NZ.

Lastly, the tobacco control experts interviewed for this study preferred a sinking lid approach to reducing tobacco outlet density, which would rely on attrition of retailers through businesses moving, closing down, or choosing not to pay the licence fee. However, research from the U.S. has recently outlined alternative ways that existing tobacco retailers could be managed if a policy to reduce outlet density was introduced. For example, 'amortization' has been suggested as a faster way to achieve reductions in outlet density; this would provide retailers with a set period of time (e.g. up to 5 years) to recoup their investment and adjust to new tobacco retail restrictions (Ackerman et al., 2016). Similar research could be conducted in NZ, possibly in collaboration with law experts, to determine the available options for managing existing retailers other than the slow process of attrition.

## Conclusions

This thesis suggests that certain tobacco retail policies may be more likely to gain political traction than others, namely: i) positive licensing of tobacco retailers; ii) prohibiting sales within 1km of all schools; iii) restricting the sale of tobacco to half the existing liquor stores in NZ; and iv) restricting the sale of tobacco to pharmacies only. Based on the perceptions of NZ's tobacco control sector and smokers, regulating the tobacco retail environment has potential to positively contribute to the 2025 goal.

# References

- Ackerman, A., Etow, A., Bartel, S., & Ribisl, K. M. (2016). Reducing the density and number of tobacco retailers: Policy solutions and legal issues. *Nicotine & Tobacco Research*, 1-8. doi: 10.1093/ntr/ntw124
- Adams, M. L., Jason, L. A., Pokorny, S., & Hunt, Y. (2013). Exploration of the link between tobacco retailers in school neighborhoods and student smoking. *Journal of School Health*, 83(2), 112-118. doi: 10.1111/josh.12006
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.
- American Psychological Association. (2016). APA Publication Manual of the American Psychological Association, Sixth Edition. Retrieved from <http://www.apastyle.org/manual/index.aspx>
- ASH. (2014). *Factsheet 1. ASH Year 10 Snapshot Survey: Topline results*. Wellington: ASH.
- Auckland Regional Public Health Service. (2015). Single cigarette sales create a shortcut to addiction. *Scoop NZ*. Retrieved from <http://www.scoop.co.nz/stories/PO1508/S00084/single-cigarette-sales-create-a-shortcut-to-addiction.htm>
- Auckland Regional Public Health Service. (2016). Dairy-owner punished for illegal trading. *Scoop.co.nz*. Retrieved from: <http://www.scoop.co.nz/stories/AK1605/S00942/dairy-owner-punished-for-illegal-trading.htm>
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., . . . Holder, H. (2003). *No ordinary commodity: alcohol and public policy*. Oxford: Oxford University Press.
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., & Grube, J. W. (2010). *Alcohol: no ordinary commodity: research and public policy* (2nd ed.). Oxford: Oxford University Press.
- Baggott, R. (2000). Analysing public health. In R. Baggott & D. J. Hunter (Eds.), *Public health: policy and politics* (pp. 1-14). London: Macmillan.
- Ball, J., Edwards, R., Waa, A., Bradbrook, S., Gifford, H., Cunningham, C., . . . Thomson, G. (2016). Is the NZ Government responding adequately to the Māori Affairs Select Committee's 2010 recommendations on tobacco control? A brief review. *New Zealand Medical Journal*, 129(1428), 93-97.

- Ball, J., Waa, A., Tautolo, E., & Edwards, R. (2016). Future Directions to Achieve 2025? Stakeholder perceptions of the smokefree2025 goal and selected 'game-changer' policies for achieving it. *Public Health Monograph Series 2016, 1*. Retrieved from <https://aspire2025.files.wordpress.com/2016/04/aspire-future-directions-report-16.pdf>
- Basham, P. (2010). *Submission to the Ministry of Health's Consultation on the Proposal to Ban Tobacco Retail Displays in New Zealand*. London, UK: Democracy Institute.
- Beauchamp, D. E. (1976). Public health as social justice. *Inquiry, 3*-14.
- Blakely, T., Thomson, G., Wilson, N., Edwards, R., & Gifford, H. (2010). The Maori Affairs Select Committee Inquiry and the road to a smokefree Aotearoa. *New Zealand Medical Journal, 123*(1326), 7-18.
- Bloom, P. N. (2001). Role of slotting fees and trade promotions in shaping how tobacco is marketed in retail stores. *Tobacco Control, 10*(4), 340-344.
- Borland, R., Yong, H.-H., O'Connor, R., Hyland, A., & Thompson, M. (2010). The reliability and predictive validity of the Heaviness of Smoking Index and its two components: findings from the International Tobacco Control Four Country study. *Nicotine & Tobacco Research, 12*(suppl 1), S45-S50.
- Bowden, J. A., Dono, J., John, D. L., & Miller, C. L. (2014). What happens when the price of a tobacco retailer licence increases? *Tobacco Control, 23*(2), 178-180.  
doi:10.1136/tobaccocontrol-2012-050615
- Braverman, M. T., & Aarø, L. E. (2004). Adolescent smoking and exposure to tobacco marketing under a tobacco advertising ban: findings from 2 Norwegian national samples. *American Journal of Public Health, 94*(7), 1230.
- Brennan, T., & Schroeder, S. (2014). Ending sales of tobacco products in pharmacies. *Journal of the American Medical Association, 311*(11), 1105-1106.
- British American Tobacco. (2012). Annual Report 2012. London, UK: British American Tobacco. Retrieved from [http://www.bat.com/group/sites/uk\\_\\_9d9kcy.nsf/vwPagesWebLive/DO9DCL3B/\\$FILE/medMD9HEG2X.pdf?openelement](http://www.bat.com/group/sites/uk__9d9kcy.nsf/vwPagesWebLive/DO9DCL3B/$FILE/medMD9HEG2X.pdf?openelement)
- Brooks, S. (1989). *Public Policy in Canada: an Introduction*. Toronto: McClelland & Stewart.

- Brown, A., Boudreau, C., Moodie, C., Fong, G., Li, G., McNeill, A., . . . Thrasher, J. (2012). Support for removal of point-of-purchase tobacco advertising and displays: findings from the International Tobacco Control (ITC) Canada survey. *Tobacco Control, 21*(6), 555-559.
- Bulmer, M., Coates, E., Dominian, L., & Duncan, S. (2007). Evidence-based policy making. In H. Bochel & S. Duncan (Eds.), *Making policy in theory and practice* (pp. 87-103). Bristol, U.K.: Policy Press.
- Burton, S., Clark, L., & Jackson, K. (2012). The association between seeing retail displays of tobacco and tobacco smoking and purchase: findings from a diary-style survey. *Addiction, 107*(1), 169-175.
- Burton, S., Hoek, J., Nesbit, P., & Khan, A. (2015). 'Smoking is bad, it's not cool...yet I'm still doing it': cues for tobacco consumption in a 'dark' market. *Journal of Business Research, In press*.
- Burton, S., Spanjaard, D., & Hoek, J. (2013). An investigation of tobacco retail outlets as a cue for smoking. *Australasian Marketing Journal (AMJ), 21*(4), 234-239.
- Caceres, L., & Chaiton, M. (2013). Hungary: state licensing for tobacco outlets. *Tobacco Control, 22*(5), 292-293.
- Caelli, K., Ray, L., & Mill, J. (2003). 'Clear as mud': toward greater clarity in generic qualitative research. *International Journal of Qualitative Methods, 2*(2), 1-13.
- Campbell, C., Hahn, R., Elder, R., Brewer, R., Chattopadhyay, S., Fielding, J., . . . Middleton, J. (2009). The effectiveness of limiting alcohol outlet density as a means of reducing excessive alcohol consumption and alcohol-related harms. *American Journal of Preventive Medicine, 37*(6), 556-569.
- Cancer Society Auckland Health Promotion Team. (2013). *Literature review: Tobacco supply strategies in a local government context*. Auckland: New Zealand Cancer Society.
- Cantrell, J., Anesetti-Rothermel, A., Pearson, J. L., Xiao, H., Vallone, D., & Kirchner, T. R. (2015). The impact of the tobacco retail outlet environment on adult cessation and differences by neighborhood poverty. *Addiction, 110*(1), 152-161.
- Carter, O., Mills, B., & Donovan, R. (2009). The effect of retail cigarette pack displays on unplanned purchases: results from immediate postpurchase interviews. *Tobacco Control, 18*(3), 218-221.



- Carter, S. M. (2003). New frontier, new power: the retail environment in Australia's dark market. *Tobacco Control, 12 (Suppl 3)*, iii95-101.
- Center for Public Health and Tobacco Policy. (2013). *Tobacco retail licensing: local regulation of the number, location and type of tobacco retail establishments in New York*. Boston, MA: The Center for Public Health and Tobacco Policy. Retrieved from <http://publichealthlawcenter.org/sites/default/files/resources/nycenter-syn-retaillicensing-s010.pdf>
- Chaloupka, F. (1999). Macro-social influences: the effects of prices and tobacco-control policies on the demand for tobacco products. *Nicotine & Tobacco Research, 1(Suppl 2)*, S77-S81.
- Chaloupka, F., Cummings, K., Morley, C., & Horan, J. (2002). Tax, price and cigarette smoking: evidence from the tobacco documents and implications for tobacco company marketing strategies. *Tobacco Control, 11(1)*, i62-i72.  
doi:10.1136/tc.11.suppl\_1.i62
- Chaloupka, F. J., Grossman, M., & Saffer, H. (2002). The effects of price on alcohol consumption and alcohol-related problems. *Alcohol Research and Health, 26(1)*, 22-34.
- Chaloupka, F. J., Yurekli, A., & Fong, G. T. (2012). Tobacco taxes as a tobacco control strategy. *Tobacco Control, 21(2)*, 172-180.
- Chan, W. C., & Leatherdale, S. T. (2011). Tobacco retailer density surrounding schools and youth smoking behaviour: a multi-level analysis. *Tob Induc Dis, 9(1)*, 9.
- Chapman, S., & Freeman, B. (2009). Regulating the tobacco retail environment: beyond reducing sales to minors. *Tobacco Control, 18(6)*, 496-501.
- Christie, B. (2013). Ambitious plan for "tobacco-free" Scotland by 2034. *BMJ, 346*, f2100.  
doi:10.1136/bmj.f2100
- Chuang, Y. C., Cubbin, C., Ahn, D., & Winkleby, M. A. (2005). Effects of neighbourhood socioeconomic status and convenience store concentration on individual level smoking. *Journal of Epidemiology & Community Health, 59(7)*, 568-573.
- Clattenburg, E., Elf, J., & Apelberg, B. (2012). Unplanned cigarette purchases and tobacco point of sale advertising: a potential barrier to smoking cessation. *Tobacco Control, 22(6)*, 376-381.

- Connor, J., Kydd, R., Rehm, J., & Shield, K. (2013). Alcohol-attributable burden of disease and injury in New Zealand: 2004 and 2007. *Research report commissioned by the Health Promotion Agency*. Wellington, NZ: Health Promotion Agency.
- Coxe, N., Webber, W., Burkhart, J., Broderick, B., Yeager, K., Jones, L., & Fenstersheib, M. (2014). Use of tobacco retail permitting to reduce youth access and exposure to tobacco in Santa Clara County, California. *Preventive Medicine, 67*, S46-S50.
- Dauphinee, A., Doxey, J., Schleicher, N., Fortmann, S., & Henriksen, L. (2013). Racial differences in cigarette brand recognition and impact on youth smoking. *BMC Public Health, 13*(1), 1.
- Davis, P., & Howden-Chapman, P. (1996). Translating research findings into health policy. *Social Science & Medicine, 43*(5), 865-872.
- Davison, W. (1996). The third-person effect revisited. *International Journal of Public Opinion Research, 8*(2), 113-119.
- Deloitte. (2011). *Alliance of Australian Retailers: Potential impact on retailers from the introduction of plain packaging*. Retrieved from [https://www.australianretailers.com.au/downloads/pdf/deloitte/2011\\_01\\_31\\_AR\\_Plain\\_Packaging2.pdf](https://www.australianretailers.com.au/downloads/pdf/deloitte/2011_01_31_AR_Plain_Packaging2.pdf)
- DiFranza, J. R. (2012). Which interventions against the sale of tobacco to minors can be expected to reduce smoking? *Tobacco Control, 21*(4), 436-442.
- Donovan, R., Jancey, J., & Jones, S. (2002). Tobacco point of sale advertising increases positive brand user imagery. *Tobacco Control, 11*(3), 191-194.
- Dorfman, L., Wallack, L., & Woodruff, K. (2005). More than a message: Framing public health advocacy to change corporate practices. *Health Education & Behavior, 32*(3), 320-336.
- Dube, S. R., Arrazola, R. A., Lee, J., Engstrom, M., & Malarcher, A. (2013). Pro-tobacco influences and susceptibility to smoking cigarettes among middle and high school students—United States, 2011. *Journal of Adolescent Health, 52*(5), S45-S51.
- Dubray, J., Schwartz, R., Garcia, J., Bondy, S., & Victor, J. (2009). Vendor compliance with Ontario's tobacco point of sale legislation. *Canadian Journal of Public Health/Revue Canadienne de Santé Publique, 109*-112.

- Dunlop, S., Kite, J., Grunseit, A., Rissel, C., Perez, D., Dessaix, A., . . . Currow, D. (2015). Out of sight and out of mind? Evaluating the impact of point-of-sale tobacco display bans on smoking-related beliefs and behaviors in a sample of Australian adolescents and young adults. *Nicotine & Tobacco Research, 17*(7), 761-768.
- Edwards, R., Ajmal, A., Healey, B., & Hoek, J. (In press). Impact of removing point-of-sale tobacco displays: data from a New Zealand youth survey. *Tobacco Control*.
- Edwards, R., Hoek, J., & van der Deen, F. (2014). Smokefree 2025—use of mass media in New Zealand lacks alignment with evidence and needs. *Australian and New Zealand Journal of Public Health, 38*(4), 395-396.
- Edwards, R., Peace, J., Hoek, J., Wilson, N., Thomson, G., & Marsh, L. (2012). Majority support among the public, youth and smokers for retail-level controls to help end tobacco use in New Zealand. *New Zealand Medical Journal, 125*(1357), 169-174.
- Edwards, R., Russell, M., Thomson, G., Wilson, N., & Gifford, H. (2011). Daring to dream: reactions to tobacco endgame ideas among policy-makers, media and public health practitioners. *BMC Public Health, 11*, 580. doi:10.1186/1471-2458-11-580
- Egger, M., & Davey Smith, G. (2001). Principles of and procedures for systematic reviews. In M. Egger, G. Davey Smith, & D. G. Altman (Eds.), *Systematic Reviews in Health Care: Meta-analysis in context* (2nd ed., pp. 23-42). London: BMJ Publishing Group.
- Euromonitor. (2014). *British American Tobacco (New Zealand) Ltd: Company Profile*. Euromonitor Passport GMID.
- Euromonitor International. (2012). *Tobacco in New Zealand*. Euromonitor International Passport GMID.
- Federal Trade Commission. (2013). *Cigarette Report for 2011*. Washington, DC: US Federal Trade Commission.
- Feighery, E., Henriksen, L., Wang, Y., Schleicher, N., & Fortmann, S. (2006). An evaluation of four measures of adolescents' exposure to cigarette marketing in stores. *Nicotine & Tobacco Research, 8*(6), 751-759.
- Feighery, E., Ribisl, K., Clark, P., & Haladjian, H. (2003). How tobacco companies ensure prime placement of their advertising and products in stores: interviews with retailers about tobacco company incentive programmes. *Tobacco Control, 12*(2), 184-188. doi:10.1136/tc.12.2.184

- Feighery, E., Ribisl, K., Schleicher, N., & Clark, P. (2004). Retailer participation in cigarette company incentive programs is related to increased levels of cigarette advertising and cheaper cigarette prices in stores. *Preventive Medicine, 38*(6), 876-884.
- Feletto, E., Burton, S., Williams, K., Fry, R., Sutton, C., Bagus, L., & Egger, S. (2016). Who stops selling? A systematic analysis of ex-tobacco retailers. *Tobacco Control* Published Online First: 9 March 2016. doi: 10.1136/tobaccocontrol-2015-052629.
- Freeman, B., Gartner, C., Hall, W., & Chapman, S. (2010). Forecasting future tobacco control policy: where to next? *Australian & New Zealand Journal of Public Health, 34*(5), 447-450. doi:10.1111/j.1753-6405.2010.00588.x
- Fry, R., Burton, S., Williams, K., Walsberger, S., Tang, A., Chapman, K., & Egger, S. (2016). Retailer licensing and tobacco display compliance: are some retailers more likely to flout regulations? *Tobacco Control* Published Online First: 8 April 2016. doi:10.1136/tobaccocontrol-2015-052767
- Gartner, C., Barendregt, J., & Hall, W. (2009). Predicting the future prevalence of cigarette smoking in Australia: how low can we go and by when? *Tobacco Control, 18*(3), 183-189.
- Gartner, C., & McNeill, A. (2010). Options for global tobacco control beyond the Framework Convention in Tobacco Control. *Addiction, 105*(1), 1-3.
- Gendall, P., Hoek, J., & Edwards, R. (2013). What does the 2025 Smokefree Goal mean to the New Zealand public? *New Zealand Medical Journal, 127*(1406), 101-103.
- Gendall, P., Hoek, J., Marsh, L., Edwards, R., & Healey, B. (2014). Youth tobacco access: trends and policy implications. *BMJ Open, 4*(4), e004631. doi:10.1136/bmjopen-2013-004631.
- Germain, D., McCarthy, M., & Wakefield, M. (2010). Smoker sensitivity to retail tobacco displays and quitting: a cohort study. *Addiction, 105*(1), 159-163.
- Glover, M., Kira, A., Cowie, N., Wong, R., Stephen, J., & Marriner, K. (2010). *The health, economic, cultural and social consequences of tobacco use in New Zealand among Māori. A report prepared for the Ministry of Health.* Auckland: University of Auckland: Centre for Tobacco Control Research.
- Gunter, B. (Undated). *The Display Ban.* Unpublished Report: The University of Leicester.
- Guthrie, J., Hoek, J., Darroch, E., & Wood, Z. (2015). A qualitative analysis of New Zealand retailers' responses to standardised packaging legislation and tobacco industry opposition. *BMJ open, 5*(11). doi:10.1136/bmjopen-2015-009521.

- Halonen, J., Kivimäki, M., Kouvonen, A., Pentti, J., Kawachi, I., Subramanian, S., & Vahtera, J. (2013). Proximity to a tobacco store and smoking cessation: a cohort study. *Tobacco Control, 23*, 146-151.
- Han, T., Alexander, M., Niggebrugge, A., Hollands, G., & Marteau, T. (2014). Impact of tobacco outlet density and proximity on smoking cessation: a longitudinal observational study in two English cities. *Health & Place, 27*, 45-50.
- Hancock, T. (1985). *Beyond health care: from public health policy to healthy public policy*: Canadian Journal of Public Health, 76 (Suppl 1), 9-11.
- Hanewinkel, R., Isensee, B., Sargent, J., & Morgenstern, M. (2011). Cigarette advertising and teen smoking initiation. *Pediatrics, 127*(2), e271-e278.
- Harrison, P., Fulkerson, J., & Park, E. (2000). The Relative Importance of Social Versus Commercial Sources in Youth Access to Tobacco, Alcohol, and Other Drugs. *Preventive Medicine, 31*(1), 39-48.
- Health Promotion Agency. (2015a). *In Fact: Young smokers' usual source of cigarettes - 2014 (Vol. 15)*. Wellington: Health Promotion Agency.
- Health Promotion Agency. (2015b). *In Fact: Young people's perceived access to tobacco - 2014. (Vol. 4)*. Wellington: Health Promotion Agency.
- Health Sciences Authority. (2015). *Tobacco Retail Licences*. Health Sciences Authority, Singapore Government.
- Henriksen, L. (2012). Comprehensive tobacco marketing restrictions: promotion, packaging, price and place. *Tobacco Control, 21*(2), 147-153.  
doi:10.1136/tobaccocontrol-2011-050416
- Henriksen, L., Feighery, E., Schleicher, N., Cowling, D., Kline, R., & Fortmann, S. (2008). Is adolescent smoking related to the density and proximity of tobacco outlets and retail cigarette advertising near schools? . *Preventive Medicine, 47*(2), 210-214.
- Henriksen, L., Feighery, E., Wang, Y., & Fortmann, S. (2004). Association of retail tobacco marketing with adolescent smoking. *American Journal of Public Health, 94*(12), 2081-2083.
- Henriksen, L., Flora, J., Feighery, E., & Fortmann, S. (2002). Effects on youth of exposure to retail tobacco advertising. *Journal of Applied Social Psychology, 32*(9), 1771-1789.

- Henriksen, L., Schleicher, N., Feighery, E., & Fortmann, S. (2010). A longitudinal study of exposure to retail cigarette advertising and smoking initiation. *Pediatrics*, *126*(2), 232-238.
- Higgins, J. & Green, S. (2011). *Cochrane Handbook for Systematic Reviews of Interventions*. The Cochrane Collaboration. Retrieved from: [http://handbook.cochrane.org/front\\_page.htm](http://handbook.cochrane.org/front_page.htm).
- Hill, A. B. (1965). The environment and disease: association or causation? *Proceedings of the Royal Society of Medicine*, *58*(5), 295.
- Hoek, J., Gifford, H., Pirikahu, G., Thomson, G., & Edwards, R. (2010). How do tobacco retail displays affect cessation attempts? Findings from a qualitative study. *Tobacco Control*, *19*(4), 334-337.
- Hoek, J., Vaudrey, R., Gendall, P., Edwards, R., & Thomson, G. (2011). Tobacco retail displays: a comparison of industry arguments and retailers' experiences. *Tobacco Control*, *21*(5), 497-501.
- Ikedo, T., Cobiac, L., Wilson, N., Carter, K., & Blakely, T. (2015). What will it take to get to under 5% smoking prevalence by 2025? Modelling in a country with a smokefree goal. *Tobacco Control*, *24* (2), 139-145.
- Jaine, R., Russell, M., Edwards, R., & Thomson, G. (2014). New Zealand tobacco retailers' attitudes to selling tobacco, point-of-sale display bans and other tobacco control measures: a qualitative analysis. *New Zealand Medical Journal*, *127*(1396), 53-66.
- Johns, M., Sacks, R., Rane, M., & Kansagra, S. M. (2013). Exposure to tobacco retail outlets and smoking initiation among New York City adolescents. *Journal of Urban Health*, *90*(6), 1091-1101.
- Keegan, W. (2010). *Analysis of consumer survey evidence relevant to the display ban requirement in England*. New York, U.S: Keegan & Company LLC.
- Kim, A. E., Loomis, B. R., Busey, A. H., Farrelly, M. C., Willett, J. G., & Juster, H. R. (2013). Influence of retail cigarette advertising, price promotions, and retailer compliance on youth smoking-related attitudes and behaviors. *Journal of Public Health Management and Practice*, *19*(6), e1-e9.
- Kim, A. E., Nonnemaker, J. M., Loomis, B. R., Baig, A., Hill, E., Holloway, J. W., . . . Shafer, P. R. (2013). Influence of tobacco displays and ads on youth: a virtual store experiment. *Pediatrics*, *131*(1), e88-e95.

- Kirchner, T. R., Cantrell, J., Anesetti-Rothermel, A., Ganz, O., Vallone, D. M., & Abrams, D. B. (2013). Geospatial exposure to point-of-sale tobacco: real-time craving and smoking-cessation outcomes. *American Journal of Preventive Medicine, 45*(4), 379-385.
- Kirchner, T. R., Villanti, A. C., Cantrell, J., Anesetti-Rothermel, A., Ganz, O., Conway, K. P., . . . Abrams, D. B. (2014). Tobacco retail outlet advertising practices and proximity to schools, parks and public housing affect Synar underage sales violations in Washington, DC. *Tobacco Control, 24*(e1), e52-e58. doi: tobaccocontrol-2013-051239.
- Kirk, S. (2016). Tobacco plain packaging likely to be law by end of year - John Key. [www.stuff.co.nz](http://www.stuff.co.nz). Retrieved from <http://www.stuff.co.nz/national/politics/76917027/tobacco-plain-packaging-likely-to-be-law-by-end-of-year--john-key>
- Kuper, A., Reeves, S., & Levinson, W. (2008). Qualitative research: An introduction to reading and appraising qualitative research. *British Medical Journal, 337*(7666), 404-407.
- Lavack, A. M., & Toth, G. (2006). Tobacco point-of-purchase promotion: examining tobacco industry documents. *Tobacco Control, 15*(5), 377-384.
- Leatherdale, S. T., & Strath, J. M. (2007). Tobacco retailer density surrounding schools and cigarette access behaviors among underage smoking students. *Annals of Behavioral Medicine, 33*(1), 105-111.
- Lee, J., Henriksen, L., Rose, S., Moreland-Russell, S., & Ribisl, K. (2015). A systematic review of neighborhood disparities in point-of-sale tobacco marketing. *American Journal of Public Health, 105*(9), e8-e18. doi:10.2105/AJPH.2015.302777
- Leonardi-Bee, J., Jere, M. L., & Britton, J. (2011). Exposure to parental and sibling smoking and the risk of smoking uptake in childhood and adolescence: a systematic review and meta-analysis. *Thorax, 66*(10), 847-855.
- Levy, D. T., Blackman, K., Currie, L. M., Levy, J., & Clancy, L. (2012). SimSmokeFinn: How far can tobacco control policies move Finland toward tobacco-free 2040 goals? *Scandinavian journal of public health, 40*(6), 544-552.
- Levy, D. T., Lindblom, E. N., Fleischer, N. L., Thrasher, J., Mohlman, M. K., Zhang, Y., . . . Nagelhout, G. E. (2015). Public Health Effects of Restricting Retail Tobacco Product Displays and Ads. *Tobacco Regulatory Science, 1*(1), 61-75.

- Li, L., Borland, R., Fong, G. T., Thrasher, J. F., Hammond, D., & Cummings, K. M. (2013). Impact of point-of-sale tobacco display bans: Findings from the International Tobacco Control Four Country Survey. *Health Education Research, 28*(5), 898-910.
- Lim, S. S., Vos, T., Flaxman, A. D., Danaei, G., Shibuya, K., Adair-Rohani, H., . . . Ezzati, M. (2012). A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet, 380*(9859), 2224-2260.
- Ling, P., & Glantz, S. (2002). Why and how the tobacco industry sells cigarettes to young adults: evidence from industry documents. *American Journal of Public Health, 92*(6), 908-916.
- Lipperman-Kreda, S. (2016). *Importance of reducing outlet density as a tobacco control strategy*. Paper presented at the Changelab Solutions Point-of-Sale Strategies Webinar Series. Retrieved from <http://www.changelabsolutions.org/publications/controlling-your-own-density>.
- Lipperman-Kreda, S., Grube, J., & Friend, K. (2012). Local tobacco policy and tobacco outlet density: associations with youth smoking. *Journal of Adolescent Health, 50*(6), 547-552.
- Lipperman-Kreda, S., Mair, C., Grube, J., Friend, K., Jackson, P., & Watson, D. (2014). Density and proximity of tobacco outlets to homes and schools: Relations with youth cigarette smoking. *Prevention Science, 15*(5), 738-744.
- Livingston, M., Chikritzhs, T., & Room, R. (2007). Changing the density of alcohol outlets to reduce alcohol-related problems. *Drug and Alcohol Review, 26*(5), 557-566.
- Loomis, B. R., Kim, A. E., Busey, A. H., Farrelly, M. C., Willett, J. G., & Juster, H. R. (2012). The density of tobacco retailers and its association with attitudes toward smoking, exposure to point-of-sale tobacco advertising, cigarette purchasing, and smoking among New York youth. *Preventive Medicine, 55*(5), 468-474.
- Lovato, C. Y., Hsu, H. C., Sabiston, C. M., Hadd, V., & Nykiforuk, C. I. (2007). Tobacco point-of-purchase marketing in school neighbourhoods and school smoking prevalence: a descriptive study. *Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique, 98*(4), 265-270.



- MacFadyen, L., Hastings, G., & MacKintosh, A. M. (2001). Cross sectional study of young people's awareness of and involvement with tobacco marketing. *BMJ*, *322*(7285), 513-517.
- MacKintosh, A. M., Moodie, C., & Hastings, G. (2012). The association between point-of-sale displays and youth smoking susceptibility. *Nicotine & Tobacco Research*, *14*(5), 616-620.
- Malone, R. E. (2010). Imagining things otherwise: new endgame ideas for tobacco control. *Tobacco Control*, *19*(5), 349-350.
- Māori Affairs Committee. (2010). *Inquiry into the tobacco industry in Aotearoa and the consequences of tobacco use for Māori*. Retrieved from [http://www.parliament.nz/NR/rdonlyres/C6AAA494-A706-48C6-8F91-6CAF5EA7CA51/164754/DBSCH\\_SCR\\_4900\\_InquiryintothetobaccoindustryinAotearoa.pdf](http://www.parliament.nz/NR/rdonlyres/C6AAA494-A706-48C6-8F91-6CAF5EA7CA51/164754/DBSCH_SCR_4900_InquiryintothetobaccoindustryinAotearoa.pdf)
- Marashi-Pour, S., Cretikos, M., Lyons, C., Rose, N., Jalaludin, B., & Smith, J. (2015). The association between the density of retail tobacco outlets, individual smoking status, neighbourhood socioeconomic status and school locations in New South Wales, Australia. *Spatial and Spatio-temporal Epidemiology*, *12*, 1-7.
- Marsh, L., Ajmal, A., McGee, R., Robertson, L., Cameron, C., & Doscher, C. (2015). Tobacco retail outlet density and risk of youth smoking in New Zealand. *Tobacco Control*, Published Online First: 1 December 2015. doi: 10.1136/tobaccocontrol-2015-052512.
- Marsh, L., Cousins, K., Gray, A., Kypri, K., Connor, J., & Hoek, J. (2016). The association of smoking with drinking pattern may provide opportunities to reduce smoking among students. *Kōtuitui: New Zealand Journal of Social Sciences Online*, *11*(1), 72-81.
- Marsh, L., Doscher, C., & Robertson, L. (2013). Characteristics of tobacco retailers in New Zealand. *Health & Place*, *23*, 165-170.
- Marsh, L., Gray, A., McGee, R., Newcombe, R., & Patterson, R. (2012). Access to cigarettes by young New Zealand smokers: little change from 2000 to 2008. *Australian and New Zealand Journal of Public Health*, *36*(5), 415-420.
- Mason, C. (2013). Ban on cigarette sales urged. *Rotorua Daily Post*. Retrieved from [http://www.nzherald.co.nz/rotorua-daily-post/news/article.cfm?c\\_id=1503438&objectid=11116342](http://www.nzherald.co.nz/rotorua-daily-post/news/article.cfm?c_id=1503438&objectid=11116342)

- McCarthy, M., Scully, M., & Wakefield, M. (2011). Price discounting of cigarettes in milk bars near secondary schools occurs more frequently in areas with greater socioeconomic disadvantage. *Australian and New Zealand Journal of Public Health*, 35(1), 71-74.
- McCarthy, W., Mistry, R., Lu, Y., Patel, M., Zheng, H., & Dietsch, B. (2009). Density of tobacco retailers near schools: effects on tobacco use among students. *American Journal of Public Health*, 99(11), 2006-2013.
- McDaniel, P. A., & Malone, R. E. (2011). Why California retailers stop selling tobacco products, and what their customers and employees think about it when they do: case studies. *BMC Public Health*, 11(1), 848-866.
- McDaniel, P. A., & Malone, R. E. (2014). "People over Profits": Retailers Who Voluntarily Ended Tobacco Sales. *PLoS ONE*, 9(1), e85751.  
doi: 10.1371/journal.pone.0085751
- McKinlay, J. B. (1993). The promotion of health through planned sociopolitical change: Challenges for research and policy. *Social Science & Medicine*, 36(2), 109-117.
- McNeill, A., Lewis, S., Quinn, C., Mulcahy, M., Clancy, L., Hastings, G., & Edwards, R. (2010). Evaluation of the removal of point-of-sale tobacco displays in Ireland. *Tobacco Control*, 20(2), 137-143.
- Milio, N. (1987). Making healthy public policy; developing the science by learning the art: an ecological framework for policy studies. *Health Promotion International*, 2(3), 263-274.
- Milio, N. (1988). Public policy as the cornerstone for a new public health: local and global beginnings. *Family & Community Health*, 11(2), 57-71.
- Ministry of Finance. (2015). *Tobacco tax*. Victoria, BC, Canada: Ministry of Finance, BC Provincial Government.
- Ministry of Health. (2010). *Tobacco use in New Zealand: Key findings from the 2009 New Zealand Tobacco Use Survey*. Wellington, NZ: Ministry of Health.
- Ministry of Health. (2012). *Annual Report for the Year ended 2012 including the Director-General of Health's Annual report on the State of Public Health*. Wellington, NZ: Ministry of Health.
- Ministry of Health. (2014a). *Annual Update of Key Results 2013/14: New Zealand Health Survey*. Wellington, NZ: Ministry of Health.

- Ministry of Health. (2014b). *Plain packaging*. Retrieved from <http://www.health.govt.nz/our-work/preventative-health-wellness/tobacco-control/plain-packaging>
- Ministry of Health. (2015a). *Annual Update of Key Results 2014/15: New Zealand Health Survey*. Wellington, NZ: Ministry of Health.
- Ministry of Health. (2015b). *Smokefree New Zealand 2025: presentation to Maori Affairs Select Committee*. Wellington, NZ: Ministry of Health.
- Ministry of Health. (2015c). *Tatau Kahukura: Māori Health Chart Book 2015 (3rd edition)*. Wellington, NZ: Ministry of Health.
- Ministry of Social Affairs and Health. (2010). *Tobacco Act 2010 Amendment*. Helsinki: Finnish Government.
- Minkler, M. (1999). Personal responsibility for health? A review of the arguments and the evidence at century's end. *Health Education & Behavior*, 26(1), 121-141.
- Mistry, R., Pednekar, M., Pimple, S., Gupta, P., McCarthy, W., Raute, L., . . . Shastri, S. (2013). Banning tobacco sales and advertisements near educational institutions may reduce students' tobacco use risk: evidence from Mumbai, India. *Tobacco Control*, 24(e1), e100-e107. doi:10.1136/tobaccocontrol-2012-050819
- Monshouwer, K., Verdurmen, J., Ketelaars, T., & van Laar, M. (2014). *Points of sale of tobacco products: synthesis of scientific and practice-based knowledge on the impact of reducing the number of points of sale and restrictions on tobacco product displays*. Utrecht, Netherlands: Trimbos Institute, Netherlands Institute for Mental Health and Addiction.
- Morgan, D. L. (1993). Qualitative content analysis: A guide to paths not taken. *Qualitative Health Research*, 3(1), 112-121.
- Myers, A., Hall, M., Isgett, L., & Ribisl, K. (2015). A comparison of three policy approaches for tobacco retailer reduction. *Preventive Medicine*, 74, 67-73.
- National Cancer Institute. (2008). *The Role of the Media in Promoting and Reducing Tobacco Use*. Bethesda, MD: National Cancer Institute. Retrieved from [http://cancercontrol.cancer.gov/brp/tcrb/monographs/19/m19\\_complete.pdf](http://cancercontrol.cancer.gov/brp/tcrb/monographs/19/m19_complete.pdf)
- National Smokefree Working Group. (2012). *The roadmap to a smokefree Aotearoa New Zealand 2025*. Wellington, NZ: New Zealand Smokefree Coalition.
- National Smokefree Working Group. (2015b). *Smokefree Aotearoa 2025: Action Plan 2015-2018*. Wellington, NZ: National Smokefree Working Group.

- Neergaard, M. A., Olesen, F., Andersen, R. S., & Sondergaard, J. (2009). Qualitative description—the poor cousin of health research? *BMC Medical Research Methodology*, 9(1), 52.
- New Zealand Association of Convenience Stores. (2015). *2012/13 Managing Committee*. Retrieved from <http://www.nzacs.com/nzacs-board/>
- New Zealand Government. (2011). *Government response to the report of the Māori Affairs Committee on its Inquiry into the tobacco industry in Aotearoa and the consequences of tobacco use for Māori*. Wellington, NZ: NZ Government. Retrieved from [http://www.parliament.nz/en-NZ/PB/Presented/Papers/d/9/b/49DBHOH\\_PAP21175\\_1-Government-Final-Response-to-Report-of-the-M-ori.htm](http://www.parliament.nz/en-NZ/PB/Presented/Papers/d/9/b/49DBHOH_PAP21175_1-Government-Final-Response-to-Report-of-the-M-ori.htm).
- New Zealand Government. (2011). *Smoke-free Environments (Controls and Enforcement) Amendment Bill*. Wellington: NZ Government. Retrieved from <http://www.legislation.govt.nz/act/public/2011/0053/latest/DLM3418508.html>
- New Zealand Government. (2012). *Sale and Supply of Alcohol Act 2012*. Wellington, NZ: NZ Government. Retrieved from <http://www.legislation.govt.nz/act/public/2012/0120/latest/DLM3339333.html>
- New Zealand Government. (2014). *Smoke-free Environments (Tobacco Plain Packaging) Amendment Bill*. Wellington: NZ Government. Retrieved from [http://www.parliament.nz/en-nz/pb/legislation/bills/00DBHOH\\_BILL12969\\_1/smoke-free-environments-tobacco-plain-packaging-amendment](http://www.parliament.nz/en-nz/pb/legislation/bills/00DBHOH_BILL12969_1/smoke-free-environments-tobacco-plain-packaging-amendment).
- New Zealand Smokefree Coalition. (2011). *Smokefree Aotearoa New Zealand by 2025: Next steps 2011-2015*. Wellington, NZ: New Zealand Smokefree Coalition.
- Nova Scotia Provincial Tax Commission. (2015). *Retail Vendor's Permit (Tobacco Retailer)*. Nova Scotia, Canada: Provincial Tax Commission.
- Novak, S. P., Reardon, S. F., Raudenbush, S. W., & Buka, S. L. (2006). Retail tobacco outlet density and youth cigarette smoking: A propensity-modeling approach. *American Journal Of Public Health*, 96(4), 670-676.
- O'Neill, M., & Pederson, A. (1992). Building a methods bridge between public policy analysis and healthy public policy. *Canadian Journal of Public Health. Revue Canadienne de Santé Publique*, 83, (Suppl 1), s25-s30.

- Öberg, M., Jaakkola, M. S., Woodward, A., Peruga, A., & Prüss-Ustün, A. (2011). Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. *Lancet*, 377(9760), 139-146.
- Office of Tobacco Control. (2015). *National register of tobacco retailers*. Office of Tobacco Control: Irish Government.
- Ontario Ministry of Finance. (2015). *Tobacco Tax: frequently asked questions about licence/permit*. Ontario, Canada: Ontario Ministry of Finance.
- Palmer, K., Bullen, C., & Paynter, J. (2013). What role can local authorities play in tobacco 'end-game' policies in New Zealand? *Policy Quarterly*, 9(3), 59-64.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (Third ed.). Thousand Oaks, CA: Sage Publications.
- Paul, C. L., Mee, K. J., Judd, T. M., Walsh, R. A., Tang, A., Penman, A., & Girgis, A. (2010). Anywhere, anytime: Retail access to tobacco in New South Wales and its potential impact on consumption and quitting. *Social Science & Medicine*, 71(4), 799-806.
- Paynter, J., & Edwards, R. (2009). The impact of tobacco promotion at the point of sale: a systematic review. *Nicotine & Tobacco Research*, 11(1), 25-35.
- Paynter, J., Edwards, R., Schluter, P., & McDuff, I. (2009). Point of sale tobacco displays and smoking among 14–15 year olds in New Zealand: a cross-sectional study. *Tobacco Control*, 18(4), 268-274.
- Pearce, J., Hiscock, R., Moon, G., & Barnett, R. (2009). The neighbourhood effects of geographical access to tobacco retailers on individual smoking behaviour. *Journal of Epidemiology & Community Health*, 63(1), 69-77.
- Pearce, J., Rind, E., Shortt, N., Tisch, C., & Mitchell, R. (2016). Tobacco retail environments and social inequalities in individual-level smoking and cessation among Scottish adults. *Nicotine & Tobacco Research*, 18(2), 138-146.
- Pearce, J., Witten, K., Hiscock, R., & Blakely, T. (2007). Are socially disadvantaged neighbourhoods deprived of health-related community resources? *International Journal of Epidemiology*, 36, 348-355.
- Pearson, A. L., van der Deen, F. S., Wilson, N., Cobiac, L., & Blakely, T. (2015). Theoretical impacts of a range of major tobacco retail outlet reduction interventions: modelling results in a country with a smoke-free nation goal. *Tobacco Control*, 24(e1), e32-e38.

- Perrin, K. (2014). *Register could help smokefree goals*. Dominion Post. Retrieved from <http://www.stuff.co.nz/dominion-post/comment/10713191/Register-could-help-smokefree-goals>
- Peterson, N., Lowe, J., & Reid, R. (2005). Tobacco outlet density, cigarette smoking prevalence, and demographics at the county level of analysis. *Substance Use & Misuse, 40*(11), 1627-1635.
- Petticrew, M., Whitehead, M., Macintyre, S. J., Graham, H., & Egan, M. (2004). Evidence for public health policy on inequalities: the reality according to policymakers. *Journal of Epidemiology and Community Health, 58*(10), 811-816.
- Philip Morris International. (2012). *2012 Annual Report*. New York, U.S: Philip Morris International. Retrieved from <http://investors.pmi.com/phoenix.zhtml?c=146476&p=irol-reportsannual>.
- Pierce, J., Choi, W., Gilpin, E., Farkas, A., & Merritt, R. (1996). Validation of susceptibility as a predictor of which adolescents take up smoking in the United States. *Health psychology, 15*(5), 355 – 361.
- Pokorny, J., Smith, V. C., & Pokorny, S. B. (2003). The relation of retail tobacco availability to initiation and continued smoking. *Journal of Clinical Child & Adolescent Psychology, 32*(2), 193-204.
- Pollay, R. W. (2007). More than meets the eye: on the importance of retail cigarette merchandising. *Tobacco Control, 16*(4), 270-274.
- Quedley, M., Ng, B., Sapre, N., Blakiston, M., Crawford, A., Devadas, R., . . . Dayal, V. (2008). In sight, in mind: retailer compliance with legislation on limiting retail tobacco displays. *Nicotine & Tobacco Research, 10*(8), 1347-1354.
- Quinn, C., Lewis, S., Edwards, R., & McNeill, A. (2010). Economic evaluation of the removal of tobacco promotional displays in Ireland. *Tobacco Control, 20*(2), 151-155.
- Radio New Zealand. (2015). *Cook Islands to ban manufacture of tobacco with law changes*. Retrieved from <http://www.radionz.co.nz/international/pacific-news/279154/cook-islands-to-ban-manufacture-of-tobacco-with-law-changes>
- Reid, R., Peterson, N., Lowe, J., & Hughey, J. (2005). Tobacco outlet density and smoking prevalence: Does racial concentration matter? *Drugs: education, prevention and policy, 12*(3), 233-238.

- Reitzel, L. R., Cromley, E. K., Li, Y., Cao, Y., Dela Mater, R., Mazas, C. A., . . . Wetter, D. W. (2011). The effect of tobacco outlet density and proximity on smoking cessation. *American Journal of Public Health, 101*(2), 315-320.
- Revenu Quebec. (2013). Fair for all: an overview of the Tobacco Tax Act. Quebec, Canada: Revenu Quebec.
- Robertson, L., Cameron, C., McGee, R., Marsh, L., & Hoek, J. (2016). Point-of-sale tobacco promotion and youth smoking: a meta-analysis. *Tobacco Control*, Published Online First 4 January 2016. doi: 10.1136/tobaccocontrol-2015-052586.
- Robertson, L., Marsh, L., Edwards, R., Hoek, J., Van der Deen, F., & McGee, R. (2016). Regulating tobacco retail in NZ: what can we learn from overseas? *New Zealand Medical Journal, 129*(1432), 74-79.
- Robertson, L., McGee, R., Marsh, L., & Hoek, J. (2014). A systematic review on the impact of point-of-sale tobacco promotion on smoking. *Nicotine & Tobacco Research, 17*(1), 2-17.
- Rose, G. (2001). Sick individuals and sick populations. *International Journal of Epidemiology, 30*(3), 427-432.
- Rose, S. W., Emery, S. L., Ennett, S., Reyes, H. L. M., Scott, J. C., & Ribisl, K. M. (2015). Retailer opinions about and compliance with family smoking prevention and tobacco control act point of sale provisions: A survey of tobacco retailers. *BMC Public Health, 15*(1), 884-893.
- Rowse, B., & Callaghan, J. (2014). *Tobacco-free retailers toolkit: a guide for local health promoters and community members*. Northland, NZ: Northland District Health Board and Cancer Society Northland.
- Roy Morgan Research. (2013). *Impact of plain packaging on small retailers - wave 2: final revised report prepared for Philip Morris Ltd*. Retrieved from <http://www.aacs.org.au/wp-content/uploads/2013/10/Impact-of-PP-on-Small-Retailers-W2-Final-Revised-Report.pdf>
- Rutherford, H. (2014). *Plain pack tobacco fight heats up*. Retrieved from <http://www.stuff.co.nz/business/industries/9939539/Plain-pack-tobacco-fight-heats-up>
- Sabatier, P., & Weible, C. (2007). The Advocacy Coalition Framework: Innovations and Clarifications. In P. Sabatier (Ed.), *Theories of the Policy Process* (2nd ed.). Colorado: Westview Press.

- Sabatini, J. (2014). SF approves 50 percent reduction in tobacco-selling stores. *The Examiner*. Retrieved from <http://archives.sfexaminer.com/sanfrancisco/sf-approves-50-percent-reduction-in-tobacco-selling-stores/Content?oid=2913907>
- Savell, E., Gilmore, A. B., & Fooks, G. (2014). How does the tobacco industry attempt to influence marketing regulations? A systematic review. *PLoS One*, 9(2), e87389.
- Schane, R. E., Glantz, S. A., & Ling, P. M. (2009). Nondaily and social smoking: an increasingly prevalent pattern. *Archives of Internal Medicine*, 169(19), 1742. doi: 10.1001/archinternmed.2009.315
- Scheffels, J., & Lavik, R. (2012). Out of sight, out of mind? Removal of point-of-sale tobacco displays in Norway. *Tobacco Control*, 2012;22:e37–e42. doi: 10.1136/tobaccocontrol-2011-050341.
- Schneider, S., & Gruber, J. (2012). Neighbourhood deprivation and outlet density for tobacco, alcohol and fast food: first hints of obesogenic and addictive environments in Germany. *Public Health Nutrition*, 1(1), 1-10.
- Schooler, C., Feighery, E., & Flora, J. A. (1996). Seventh graders' self-reported exposure to cigarette marketing and its relationship to their smoking behavior. *American Journal of Public Health*, 86(9), 1216-1221.
- Scottish Government. (2011). *Scottish Tobacco Retailers Register*. Scottish Government. Retrieved from <http://www.tobaccoregisterscotland.org/>
- Scully, M., McCarthy, M., Zacher, M., Warne, C., Wakefield, M., & White, V. (2013). Density of tobacco retail outlets near schools and smoking behaviour among secondary school students. *Australian and New Zealand Journal of Public Health*, 37(6), 574-578.
- Sedgwick, P. (2014). Ecological studies: advantages and disadvantages. *British Medical Journal*, 348: g2979. doi: 10.1136/bmj.g2979.
- Shadel, W. G., Martino, S. C., Setodji, C., & Scharf, D. (2013). Exposure to pro-smoking media in college students: does type of media channel differentially contribute to smoking risk? *Annals of Behavioral Medicine*, 45(3), 387-392.
- Shang, C., Huang, J., Cheng, K., Li, Q., & Chaloupka, F. (2016). Global evidence on the association between POS advertising bans and youth smoking participation. *International Journal of Environmental Research and Public Health*, 13(3), 306.



- Shiffman, S., Balabanis, M., Fertig, J., & Allen, J. (1995). Associations between alcohol and tobacco. *Alcohol and tobacco: from basic science to clinical practice. NIAAA Research Monograph, 30*, 17-36.
- Shin, D.-H., & Kim, J. K. (2011). Alcohol product placements and the third-person effect. *Television & New Media, 12*(5), 412-440.
- Shortt, N., Tisch, C., Pearce, J., Mitchell, R., Richardson, E., Hill, S., & Collin, J. (2015). A cross-sectional analysis of the relationship between tobacco and alcohol outlet density and neighbourhood deprivation. *BMC Public Health, 15*(1), 1.
- Shortt, N., Tisch, C., Pearce, J., Richardson, E., & Mitchell, R. (2016). The density of tobacco retailers in home and school environments and relationship with adolescent smoking behaviours in Scotland. *Tobacco Control, 25*(1), 75-82.
- Signal, L. (1998). The politics of health promotion: insights from political theory. *Health Promotion International, 13*(3), 257-263.
- Slater, S., Chaloupka, F., Wakefield, M., Johnston, L., & O'Malley, P. (2007). The impact of retail cigarette marketing practices on youth smoking uptake. *Archives of Pediatrics & Adolescent Medicine, 161*(5), 440-445.
- Smyth, C., Freeman, B., & Maag, A. (2015). Tobacco retail regulation: the next frontier in tobacco control? *Public Health Research & Practice, 25*(3), e2531529. doi: <http://dx.doi.org/10.17061/phrp2531529>
- Spanopoulos, D., Britton, J., McNeill, A., Ratschen, E., & Szatkowski, L. (2014). Tobacco display and brand communication at the point of sale: implications for adolescent smoking behaviour. *Tobacco Control, 23*(1), 64-69.
- StataCorp. (2013). *Stata Statistical Software: Release 13*. College Station, TX: StataCorp LP.
- Statistics NZ. (2004). *New Zealand: an urban/ rural profile*. Retrieved from [http://www.stats.govt.nz/browse\\_for\\_stats/Maps\\_and\\_geography/Geographic-areas/urban-rural-profile.aspx](http://www.stats.govt.nz/browse_for_stats/Maps_and_geography/Geographic-areas/urban-rural-profile.aspx)
- Stead, L., & Lancaster, T. (2000). A systematic review of interventions for preventing tobacco sales to minors. *Tobacco Control, 9*(2), 169-176.
- Studlar, D. T. (2005). The Political Dynamics of Tobacco Control in Australia and New Zealand: Explaining Policy Problems, Instruments, and Patterns of Adoption. *Australian Journal of Political Science, 40*(2), 255-274.

- Thomson, G., Edwards, R., Wilson, N., & Blakely, T. (2012). What are the elements of the tobacco endgame? *Tobacco Control, 21*(2), 293-295.
- Thomson, G., Hoek, J., Edwards, R., & Gifford, H. (2008). Evidence and arguments on tobacco retail displays: marketing an addictive drug to children? *New Zealand Medical Journal, 121*(1276), 87-98.
- Thomson, G., Wilson, N., Blakely, T., & Edwards, R. (2010). Ending appreciable tobacco use in a nation: using a sinking lid on supply. *Tobacco Control, 19*(5), 431-435.
- Tilson, M. (2011). *Reducing the availability of tobacco products at retail: policy analysis*. Ottawa: Non-Smokers' Rights Association. Retrieved from: [http://www.nsr-aadnf.ca/cms/file/files/Reducing\\_Retail\\_Availabilty\\_policy\\_analysis\\_final\\_2011.pdf](http://www.nsr-aadnf.ca/cms/file/files/Reducing_Retail_Availabilty_policy_analysis_final_2011.pdf)
- Tilson, M., Cohen, J., McDonald, K., Giesbrecht, N., Maga, W., Mecredy, G., & Chaiton, M. (2013). *Reducing Tobacco Retail Availability*. Toronto, Ontario: Ontario Tobacco Research Unit.
- Tobaksfakta. (2016). *The Swedish Government aims at Smoke Free Sweden 2025*. Retrieved from <http://tobaksfakta.se/nyheter/the-swedish-government-aims-at-smoke-free-sweden-2025/>
- U.S. Department of Health and Human Services. (2014). *Surgeon General's Report: The Health Consequences of Smoking—50 Years of Progress*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- van der Deen, F. S., Ikeda, T., Cobiac, L., Wilson, N., & Blakely, T. (2014). Projecting future smoking prevalence to 2025 and beyond in New Zealand using smoking prevalence data from the 2013 Census. *New Zealand Medical Journal, 127*(1406), 71-79.
- van der Deen, F. S., Pearson, A. L., & Wilson, N. (2014). Ending the sale of cigarettes at US pharmacies. *Journal of the American Medical Association, 312*(5), 559-559.
- Wakefield, M., Germain, D., Durkin, S., & Henriksen, L. (2006). An experimental study of effects on schoolchildren of exposure to point-of-sale cigarette advertising and pack displays. *Health Education Research, 21*(3), 338-347.
- Wakefield, M., Germain, D., & Henriksen, L. (2008). The effect of retail cigarette pack displays on impulse purchase. *Addiction, 103*(2), 322-328.

- Watanabe, I., Shigeta, M., Inoue, K., Matsui, D., Ozaki, E., Kuriyama, N., . . . Watanabe, Y. (2013). Personal factors associated with smoking among marginalized and disadvantaged youth in Japan. *International Journal of Behavioral Medicine, 20*(4), 504-513.
- Weiss, J., Cen, S., Schuster, D., Unger, J., Johnson, C., Mouttapa, M., . . . Cruz, T. (2006). Longitudinal effects of pro-tobacco and anti-tobacco messages on adolescent smoking susceptibility. *Nicotine & Tobacco Research, 8*(3), 455-465.
- Wellman, R. J., Sugarman, D. B., DiFranza, J. R., & Winickoff, J. P. (2006). The extent to which tobacco marketing and tobacco use in films contribute to children's use of tobacco: a meta-analysis. *Archives of Pediatrics & Adolescent Medicine, 160*(12), 1285-1296.
- Wells, G., Shea, B., O'connell, D., Peterson, J., Welch, V., Losos, M., & Tugwell, P. (2000). The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses.
- West, J. H., Blumberg, E. J., Kelley, N. J., Hill, L., Sipan, C. L., Schmitz, K. E., . . . Hovell, M. F. (2010). Does proximity to retailers influence alcohol and tobacco use among Latino adolescents? *Journal of Immigrant and Minority Health, 12*(5), 626-633. doi:DOI 10.1007/s10903-009-9303-2
- Whyte, G., Gendall, P., & Hoek, J. (2014). Advancing the retail endgame: public perceptions of retail policy interventions. *Tobacco Control, 23*, 160-166.
- Widome, R., Brock, B., Noble, P., & Forster, J. (2012). The relationship of point-of-sale tobacco advertising and neighborhood characteristics to underage sales of tobacco. *Evaluation & the Health Professions, 35*(3), 331-345.
- Wilkins, C. (2014). The interim regulated legal market for NPS ('legal high') products in New Zealand: The impact of new retail restrictions and product licensing. *Drug Testing and Analysis, 6*(7-8), 868-875.
- Wilkins, C., Sheridan, J., Adams, P., Russell, B., Ram, S., & Newcombe, D. (2013). The new psychoactive substances regime in New Zealand: a different approach to regulation. *Journal of Psychopharmacology, 27*(7), 584-589.
- Wilkins, C., & Sweetsur, P. (2008). Tracking the availability of drugs in New Zealand: Implications for policy response. *Social Policy Journal of New Zealand, 34*, 163-171.

- Wilson, N., Blakely, T., & Tobias, M. (2006). What potential has tobacco control for reducing health inequalities? The New Zealand situation. *International Journal for Equity in Health*, 5(1), 1-11.
- Wilson, N., Edwards, R., Hoek, J., Thomson, G., & Jaine, R. (2016). Could New Zealand's law on "New Psychoactive Substances" provide lessons for achieving the Smokefree 2025 Goal? *New Zealand Medical Journal*, 129(1432), 94-96.
- Wilson, N., Edwards, R., Thomson, G., Weerasekera, D., Gifford, H., & Hoek, J. (2010). High and increased support by Māori and non-Māori smokers for a ban on point-of-sale tobacco displays: national survey data. *New Zealand Medical Journal*, 123(1317), 84-86.
- Winstanley, M. e. a. (2011). *Alcohol and cancer: a position statement from Cancer Council Australia*. Canberra: Cancer Council Australia.
- Winstock, A. R., & Barratt, M. J. (2013a). The 12-month prevalence and nature of adverse experiences resulting in emergency medical presentations associated with the use of synthetic cannabinoid products. *Human Psychopharmacology: Clinical and Experimental*, 28(4), 390-393.
- Winstock, A. R., & Barratt, M. J. (2013b). Synthetic cannabis: a comparison of patterns of use and effect profile with natural cannabis in a large global sample. *Drug and Alcohol Dependence*, 131(1), 106-111.
- World Health Organisation. (1986). *Ottawa Charter for Health Promotion*. Geneva: World Health Organisation.
- World Health Organisation. (2009). *History of the World Health Organisation Framework Convention on Tobacco Control*: World Health Organisation.
- World Health Organisation. (2011). *WHO report on the global tobacco epidemic, 2011: warning about the dangers of tobacco*: World Health Organisation.
- World Health Organisation. (2012a). *European action plan to reduce the harmful use of alcohol 2012-2020*. Copenhagen: World Health Organisation.
- World Health Organisation. (2012b). *Tobacco Factsheet No. 339*. Geneva: World Health Organisation Media Centre.
- World Health Organisation. (2013). *Fiji Ministry of Health publishes new Tobacco Control Regulations*. Retrieved from [http://www.who.int/fctc/implementation/news/news\\_fiji/en/](http://www.who.int/fctc/implementation/news/news_fiji/en/)

- World Health Organisation. (2015). *Parties to the WHO Framework Convention on Tobacco Control*. Retrieved from [http://www.who.int/fctc/signatories\\_parties/en/](http://www.who.int/fctc/signatories_parties/en/)
- World Health Organisation. (1998). Health promotion glossary. *Geneva: World Health Organisation*, 6.
- World Health Organisation. (2003). WHO Framework Convention on Tobacco Control (pp. 36): World Health Organisation.
- Yu, D., Peterson, N. A., Sheffer, M. A., Reid, R. J., & Schnieder, J. E. (2010). Tobacco outlet density and demographics: analysing the relationships with a spatial regression approach. *Public Health*, 124(7), 412-416.
- Zacher, M., Germain, D., Durkin, S., Hayes, L., Scollo, M., & Wakefield, M. (2013). A store cohort study of compliance with a point-of-sale cigarette display ban in Melbourne, Australia. *Nicotine & Tobacco Research*, 15(2), 444-449.

# Appendices

### Appendix 1. Meta-analysis data extraction form

Study number:	
Authors:	
Publication year:	
Study design:	
Country:	
Exposure measure:	
Outcome measure:	
Is the outcome cognitive or behavioural? (circle)	Cognitive                      Behavioural
Age of participants:	
Sample size (i.e. Ns used in regression):	
Response rate:	
Adjusted OR and 95% CIs:	
Confounders controlled for:	
Comments:	

## Appendix 2. Quality scoring of observational research on the association between POS tobacco promotion.

A study can be awarded a maximum of one point for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability.

### **Cohort studies**

#### **Selection**

##### 1. Representativeness of the exposed sample (1 point max)

- a. truly representative of the average population of young people in the community (award 1 point)
- b. somewhat representative of the average population of young people in the community (award 1 point)
- c. selected group of users e.g. nurses, volunteers
- d. no description of the derivation of the cohort

##### 2. Ascertainment of exposure (1 point max)

- a. secure record e.g. surgical records (award 1 point)
- b. structured interview (award 1 point)
- c. written self-report – if objective measure used (e.g. store visiting frequency) award 0.5 point; subjective measure (e.g. noticing of tobacco displays in store) = 0
- d. no description

##### 3. Demonstration that outcome of interest was not present at start of study (1 point max)

- a. yes (award 1 point)
- b. no

#### **Comparability**

##### 1. Comparability of cohorts on the basis of the design or analysis (2 points max)

- a. study controls for smoking by parents and friends (award 1 point)
- b. study controls for SES (award 1 point)

#### **Outcome**

##### 1. Assessment of outcome (1 point max)

- a. independent blind assessment (award 1 point)
- b. record linkage (award 1 point)
- c. self-report
- d. no description

##### 2. Was follow up long enough for outcomes to occur (1 point max)

- a. yes (select adequate follow-up period for outcome of interest) (award 1 point)
- b. no

##### 3. Adequacy of follow-up of cohorts (1 point max)

- a. complete follow-up – all participants accounted for (award 1 point)
- b. participants lost to follow-up unlikely to introduce bias – small number lost or description provided of those lost (award 1 point)
- c. follow up rate not good and no description of those lost
- d. no statement

Per study: divide the number of points by the denominator & multiply by 10



## **Cross-sectional studies**

### **Selection**

#### **1. Representativeness of the exposed sample (1 point max)**

- a. truly representative of the average population of young people in the community (award 1 point)
- b. somewhat representative of the average population of young people in the community (award 1 point)
- c. selected group of users e.g. nurses, volunteers
- d. no description of the derivation of the cohort

#### **2. Ascertainment of exposure (1 point max)**

- a. secure record e.g. surgical records (award 1 point)
- b. structured interview (award 1 point)
- c. written self-report – if objective measure used (e.g. store visiting frequency) award 0.5 point; subjective measure (e.g. noticing of tobacco displays in store) = 0
- d. no description

### **Comparability**

#### **1. Comparability of cohorts on the basis of the design or analysis (2 points max)**

- a. study controls for smoking by parents and friends (award 1 point)
- b. study controls for SES (award 1 point)

### **Outcome**

#### **1. Assessment of outcome (1 point max)**

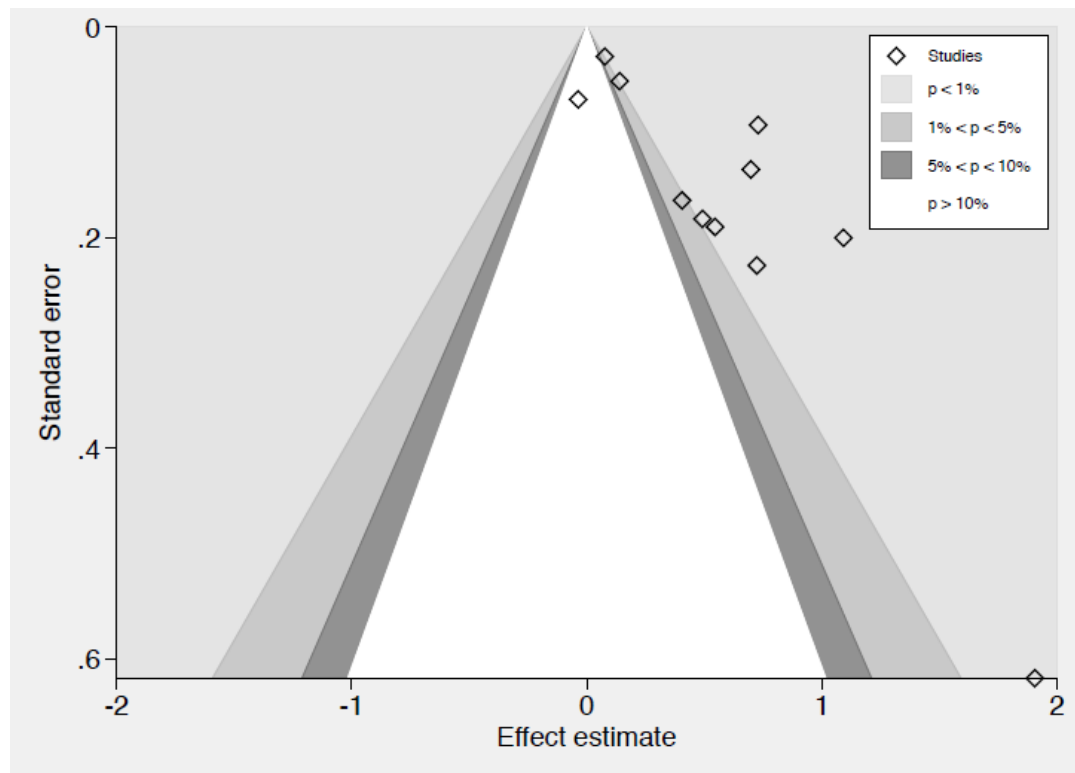
- a. independent blind assessment (award 1 point)
- b. record linkage (award 1 point)
- c. self-report
- d. no description

Per study: divide the number of points by the denominator & multiply by 10

**Appendix 3. Studies of children and youth included in meta-analysis and previous systematic reviews**

<b>Systematic Review</b>	<b>Author</b>	<b>Included in meta-analysis</b>	<b>Reason for exclusion/inclusion</b>
Paynter & Edwards (2009)	(Schooler et al., 1996)	Y	
	(MacFadyen et al., 2001)	N	Exposure measure not specific to POS
	(Henriksen, et al., 2002)	N	Experimental design
	(Henriksen et al., 2004)	Y	
	(Braverman & Aarø, 2004)	Y	
	(Feighery et al., 2006)	Y	
	(Slater et al., 2007)	Y	
	(Lovato et al., 2007)	N	Outcome was population-level smoking prevalence
	(Wakefield et al., 2006)	N	Experimental design
	(Weiss et al., 2006)	N	Exposure measure not specific to POS
Part A of Chapter 3/ Robertson et al. (2014)	(Dauphinee et al., 2013)	Y	
	(Henriksen et al., 2010)	Y	
	(Henriksen et al., 2008)	N	Outcome was population-level smoking prevalence
	(Kim, Loomis, et al., 2013)	Y	
	(Kim, Nonnemaker, et al., 2013)	N	Experimental design
	(MacKintosh et al., 2012)	Y	
	(Paynter & Edwards, 2009)	Y	
	(Shadel et al., 2013)	N	College age sample
	(Spanopoulos et al., 2014)	Y	
n/a	(Dube et al., 2013)	Y	Published subsequent to the literature search dates in Robertson et al.
	(Watanabe et al., 2013)	Y	Published subsequent to the literature search dates in Robertson et al. (2014)

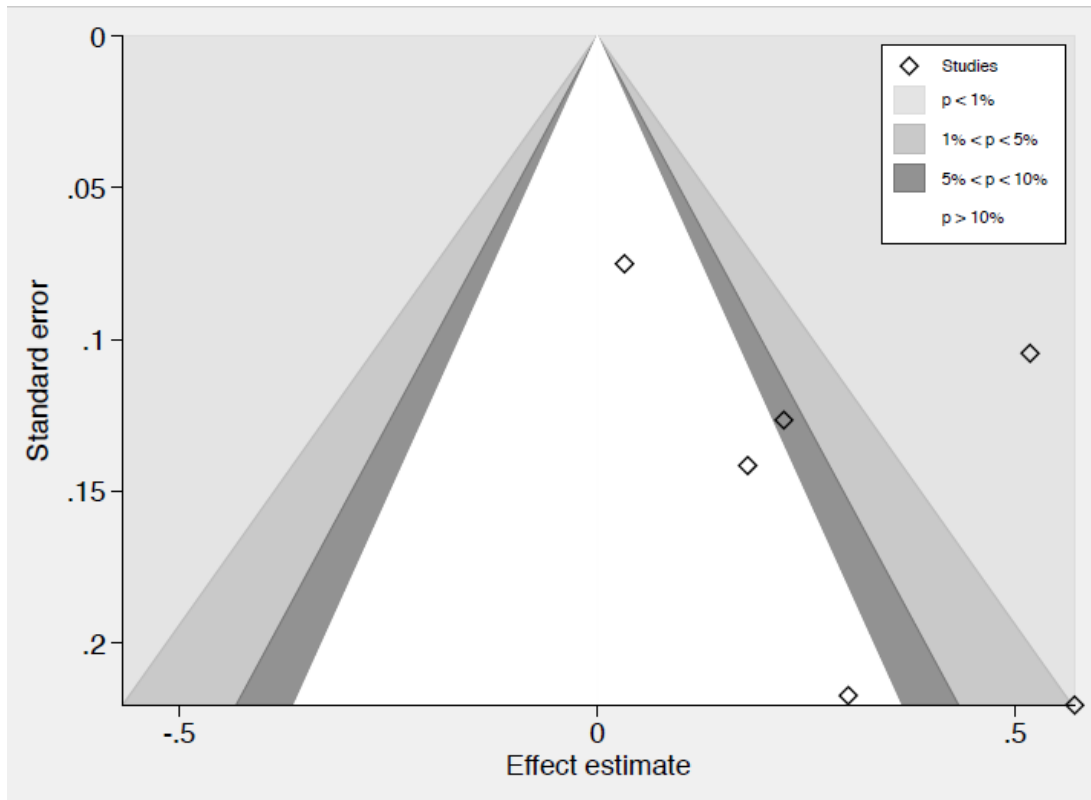
#### Appendix 4. Funnel plot of studies examining association between POS tobacco promotion and behavioural outcomes



#### Explanation of funnel plots

A funnel plot is a scatter plot of the intervention effect estimates from individual studies against a measure of each study's size or precision. The precision of the estimated intervention effect increases as the size of the study increases. Effect estimates from small studies therefore scatter more widely at the bottom of the graph, and the spread narrows among larger studies. If there is no bias, the plot should resemble a symmetrical (inverted) funnel. If there is bias (e.g. because smaller studies without statistically significant effects remain unpublished) this will lead to an asymmetrical appearance of the funnel plot. In this situation, the effect calculated in a meta-analysis will tend to overestimate the intervention effect. The more pronounced the asymmetry, the more likely it is that the amount of bias will be substantial. However, publication bias need not lead to asymmetry in funnel plots. Further, some effect estimates (e.g. odds ratios and standardized mean differences) are naturally correlated with their standard errors, and can produce spurious asymmetry in a funnel plot. Adapted from Higgins & Green (2011)

Appendix 5. Funnel plot of studies examining association between POS tobacco promotion and smoking susceptibility



## Appendix 6. Semi-structured interview guide for qualitative research with tobacco control experts

### Introductory questions

1. Why don't we start with the 2025 goal – how would you define a smokefree NZ? Can you tell me a bit more about your definition – how did you come up with this?
2. How likely do you think it is that New Zealand will be smokefree by 2025? What makes you say that?
3. What do you think needs to happen for NZ to be smokefree by 2025?

### General views on retail-level interventions

4. Thinking of the smokefree roadmap, what do you think are the most important components of this? What makes you say this? In your view, how important are retail-level interventions within the roadmap?
5. Aside from a complete ban on tobacco sales, if you could change anything about how tobacco is currently sold in NZ, what changes would you make? What effects would that have? Keep probing all ideas.
  - *What are the barriers to this policy being implemented?*
  - *What would be needed to get this policy on the political agenda?*

### Views on registration, licensing and potential restrictions on tobacco retailing

6. In New South Wales, Australia, local authorities have implemented a tobacco retailer registration scheme [check if they are aware/ provide brief summary of what's involved]. How important is it, do you think, for tobacco retailers in NZ to be registered?
  - *If you could design a registration system, what features would it have?*
  - *What would be the advantages of registering tobacco retailers?*
7. In some jurisdictions, tobacco retailers are required to have a licence to be able to sell tobacco, much like New Zealand's licensing system for alcohol. What are your views on NZ having a tobacco retailer licensing system?
  - *If you could design a licensing system, what would it look like?*
  - *What would be the advantages of licensing tobacco retailers?*
  - *What do you see as being the differences between a registration and a licensing system?*

8. Licensing could enable different restrictions to be placed on tobacco retailers – what kind of restrictions do you think would be most important to pursue?

- *What effect would this have?*
- *Feasibility?*
- *Difficulties or challenges?*
- *Fairness to retail business owners?*

9. Depending on what has been discussed beforehand, probe participants views towards the following policy options, if not covered previously:

- *Restrictions on location e.g. zoning around schools*
- *Restrictions on outlet type (e.g. banning dairies, supermarkets and / or convenience stores from selling tobacco)*
- *How about if the sale of tobacco was banned anywhere that alcohol was sold?*

#### Other retail interventions

10. Imagine that tobacco retailers had to demonstrate sufficient knowledge of the Smokefree Act in order to get a licence, how do you feel about this type of requirement?

- *How would you suggest this is done?*

11. Some researchers have suggested that all tobacco retailers should be required to promote smoking cessation. What do you think of this idea?

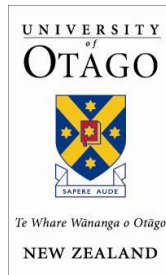
#### Role-related questions

- *How long have you worked in tobacco control sector?*
- *Would you mind telling me your age?*
- *What ethnic group or groups do you belong to?*
- *What is your own smoking status?*

#### Closing questions

- *That covers everything I wanted to ask. Is there anything you would like to add?*
- *Offer to send transcript of interview*

## Appendix 7. Information sheet for qualitative research with tobacco control experts



# Tobacco Retailing in New Zealand Participant Information Sheet

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Tēna koe/ Hello

We would like to invite you to take part in a study looking at the way tobacco is retailed in this country.

Who are we?

This study is being led by Lindsay Robertson, as part of her PhD in public health. She is supervised by Professor Rob McGee, Dr Louise Marsh and Professor Janet Hoek. We are all researchers at the University of Otago in Dunedin and members of the Aspire2025 research collaboration ([www.aspire2025.org.nz](http://www.aspire2025.org.nz)).

What is aim of the study?

We are exploring different tobacco retail policies that would change the way tobacco is sold in NZ. We want to find out stakeholders' perceptions of these policies and what they think the impact of these policies might be.

Who is being asked to take part?

We are asking a sample of people working in tobacco control in New Zealand to take part in this study. We are also running similar research with tobacco retailers.

We are involving a wide range of people so that we get a broad understanding about the possible impacts of different tobacco retail policies.

### What will be involved in the study?

If you agree to take part, you will be asked to participate in a telephone interview. This will be scheduled at a time that is convenient for you. The interview should take approximately 20 minutes and, with your permission, will be recorded so that it can be later transcribed.

### What will I be asked?

During the interview, you will be asked your thoughts on a range of different policies that would change how tobacco is sold in NZ. Examples of these policies are:

- Requiring all tobacco retailers to be registered or licensed
- Only allowing tobacco to be sold in certain types of outlet
- Not allowing tobacco to be sold in certain zones, such as near schools
- Requiring smoking cessation products to be available wherever tobacco is sold

The Ethics Committee has approved the general areas to be explored in the interview. You will be able to answer any question with as much or as little detail as you like. The questions will explore:

- What you think about how tobacco is currently retailed.
- What you think about the different policies (listed above), and what you think would happen if they were introduced.
- How each of the policies might affect you, in terms of your work.
- How each of the policies might affect others, for example, young people trying to buy cigarettes, or people trying to quit smoking.
- The barriers, challenges and facilitating factors to implementing each of these policies.
- Any ideas you might have about how to change the way tobacco is sold.

### What other information will be collected and how will it be used?

We will ask you about your age, sex, ethnicity, smoking status and occupation. This data will only be used to provide a description of the people who have participated in our research, and will only be seen by the lead researcher. Specific details that might identify you will not be published.

Some of the information you provide in the interview may enable others to identify you, due to the relatively small number of people working in these roles in NZ. However, when the results are written up they will be summarised as general themes, and will not be linked to individual respondents. Every effort will be maintained to preserve your anonymity, for example, any quotes we use will be anonymous.

Any potentially sensitive information discussed in the interview (e.g. breaches of smokefree legislation) will be treated as such, and results we publish will not contain details of specific incidents or complaints.

The results of this research may be published by the researchers and then used by organisations working in tobacco control.



### How will the data be stored?

The transcript of the interview will be stored securely for at least 5 years according to University of Otago policy and will only be seen by the team directly involved in the research and the person or organisation transcribing the tapes.

### Other things you need to know

- Lindsay will contact you in the next few weeks to arrange a time and date for the interview.
- If you have any queries or need more information please contact Lindsay Robertson (contact details below).
- You may decide not to take part in the project at any time and without any disadvantage to yourself of any kind.
- Everyone who agrees to take part will be provided with a summary of the results of the study after it has been completed.
- The University of Otago Human Ethics Committee has reviewed and approved this project. If you have any concerns about the research you should contact the Committee through the Human Ethics Committee Administrator (ph 03 479 8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

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### Lead Researcher

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Phone (03) 479 7692.

Email: janet.hoek@otago.ac.nz

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## Appendix 8. Semi-structured interview guide for qualitative research with tobacco retailers.

1. What are your main responsibilities in the store?
2. What are the most popular tobacco products you sell?
3. Changes to tobacco displays came into effect nearly two years ago; what changes did you make in your store?
  - *How did you feel about having to make those changes?*
  - *How has the law change affected your business?*
  - *How do you think moving tobacco behind cupboards or in drawers has affected people who come in to buy tobacco?*
  - *What costs did you incur when making changes to storage and signage?*
  - *Did you get any help from tobacco companies when you were preparing for the law changes?*
4. How many tobacco companies do you deal with?
  - *What on-going support do you get from them now?*
  - *How often do you hear from them? – check nature of contact – visits, phone etc*
  - *How do you decide which brands to stock?*
5. And how about the Smokefree Enforcement Officers, how often do you hear from them or see them?
  - *What support do you get from them?*
6. Thinking about the tobacco display requirements, how confident are you that your store meets these?
7. What have you heard about plain packaging for cigarettes? What do you think would happen if that was introduced? What makes you think that?
8. Can you tell me a bit about who sets the price of tobacco? Can this be varied?
9. How do you feel about the government increasing the tax on tobacco each year?
10. Generally speaking, do you support the idea of making tobacco less widely available?

*Provide feedback: What you've been telling me so far is really helpful. Now, I'd like to spend the rest of the interview talking about some ideas that – in theory – the government could introduce to change how tobacco is sold in New Zealand. I'm going to ask you to imagine different scenarios and I'd like to know how you feel about these ideas... particularly how they might affect you and your business.*

1. Imagine that the government required all shops to be registered to be able to sell tobacco.

- *What do you think this would involve?*
- *What do you think of this idea?*

2. What if shops had to have a licence before they could sell tobacco?

- *What do you think licensing means?*
- *What do you think the implications would be for you?*

3. If there was a fee to get a licence to sell tobacco, and the fee was \$100 – how likely would you be to apply for a licence? How about if the fee was \$500, how likely would you be to get a licence then?

3. What if shops had to give out information about quitting smoking with every tobacco purchase?

- *How would you feel about this?*
- *How do you think your staff would feel about this?*

4. Imagine that shops were not able to sell cigarettes and tobacco if they also sold alcohol.

- *What are your views on this idea?*
- *How do you think this policy would affect your business?*

5. Imagine that the government passed a law that said tobacco stores located within 500m of a school could no longer sell tobacco.

- *How would you feel about this?*
- *\*\*\* might need to discuss two separate options: i) stores near schools would have to stop selling tobacco, or ii) only new stores wanting to sell tobacco near school would be refused a licence*

6. What if the government passed a law that meant [your outlet type] was no longer able to sell tobacco.

- *How would you feel about this law?*
- *How do you think this law would affect your business?*

7. Overall, how do you feel about selling tobacco?

- *Some store owners have said it would be easier not to sell tobacco, but others think it is important to sell tobacco. Which view is closest to your opinion?*

8. Thinking about nicotine replacement therapy, like lozenges, gum and patches, that help smokers who are trying to quit. Do you sell any of these products in your store?

- *If yes, how popular are these products? Profit margin?*
- *Would you consider selling these? Probe – what makes you say this?*

9. Have you heard about the New Zealand government's goal to be a smokefree country by 2025?

- *What do you think this means?*
- *What are your views about the goal? What do you think needs to happen to achieve the goal? How likely do you think it will be achieved?*

*Provide feedback: we're just about at the end of the interview. This has been really interesting, and it's great to get your views on these policies. Just a few more quick questions.*

### **Demographic & related questions**

1. How long have you worked here/ owned this store?

2. Would you mind telling me your age?

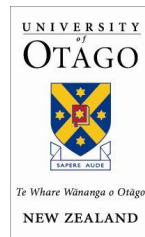
3. What ethnic group or groups do you belong to?

4. How often do you yourself smoke now? (at least once a day; at least once a week, less often than once a week).

5. That covers everything I wanted to ask. Is there anything you would like to add?

Ask them to sign for receipt of voucher.

## Appendix 9. Information sheet for qualitative research with tobacco retailers



# Tobacco Retailing in New Zealand

## Participant Information Sheet

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Tena koe/ Hello

We would like to invite you to take part in a study looking at the way tobacco is sold in this country.

Who are we?

This study is being led by Lindsay Robertson, as part of her PhD in public health. She is supervised by Professor Rob McGee, Dr Louise Marsh and Professor Janet Hoek. We are all researchers at the University of Otago in Dunedin.

What is aim of the study?

We are exploring different tobacco retail policies that would change the way tobacco is sold in NZ. We want to find out retailers' perceptions of these policies and what they think the impact of these policies might be.

Who is being asked to take part?

We are asking people to take part in this study who are aged 18 years and above and who own, or are responsible for, the running of a retail outlet where tobacco is sold.

Will I be reimbursed for taking part?

You will receive a \$40 Warehouse voucher as a reimbursement for any expenses you may incur through taking part.

What will be involved in the study?

If you agree to take part, you will be asked to participate in a face-to-face interview with a researcher. This will be scheduled at a time and a location that is convenient for you. The interview should take approximately 25 minutes and, with your permission, will be recorded so that it can be later transcribed.

### What will I be asked?

During the interview, you will be asked your thoughts on a range of different policies that would change how tobacco is retailed in NZ. Examples of these policies are:

- Requiring smoking cessation products to be available wherever tobacco is sold
- Requiring all tobacco retailers to be registered or licensed
- Only allowing tobacco to be sold in certain types of outlet
- Not allowing tobacco to be sold in certain zones, such as near schools

The Ethics Committee has approved the general areas to be explored in the interview. You will be able to answer any question with as much or as little detail as you like. The questions will be around:

- What you think about how tobacco is currently sold in NZ.
- What you think about the different policies (listed above), and what you think would happen if they were introduced.
- How each of the policies might affect you.
- How each of the policies might affect others, for example, young people trying to buy cigarettes, or people trying to quit smoking.
- The barriers and challenges that be involved if policies like these were set up.
- Any ideas you might have about how to change the way tobacco is sold.

### What other information will be collected and how will it be used?

We will also ask you about your age, sex, ethnicity, smoking status and occupation. This data will only be used to summarise the people who have participated, and will only be seen by the lead researcher. Specific details that might identify you will not be published.

Any potentially sensitive information discussed in the interview (e.g. opinions of smokefree legislation or any breaches or complaints relating to smokefree legislation) will be treated as such. Any results we publish will not contain details of specific incidents or complaints and we will not pass any information such as this onto a third party.

When the results are written up they will be summarised as general themes and will not be linked to individual respondents, and every effort will be maintained to preserve your anonymity.

### How will the information be used and stored?

All of the information will be stored securely for at least 5 years according to University of Otago policy, and will only be seen by the team directly involved in the research, and the person or organisation transcribing the tapes. The results of this research may be published and then used by organisations working in tobacco control.

### Other things you need to know

- Before the interview takes place, you will need to read and sign a form which says you understand and agree to participating in this study.
- If you have any queries or need more information please contact Lindsay Robertson (contact details below).
- You may decide not to take part in the project at any time and without any disadvantage to yourself of any kind.
- Everyone who agrees to take part will be provided with a summary of the results of the study after it has been completed.
- The University of Otago Human Ethics Committee has reviewed and approved this project. If you have any concerns about the research you should contact the Committee through the Human Ethics Committee Administrator (ph 03 479 8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

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### Lead Researcher

Miss Lindsay Robertson

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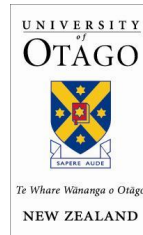
PO Box 913, Dunedin 9054.

Phone (03) 479 7692.

Email: janet.hoek@otago.ac.nz

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Appendix 10. Consent form for qualitative research with tobacco retailers.



## Tobacco Retailing in New Zealand

### Consent Form for Interview Participants

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This form is to obtain your agreement to take part in our study looking at the way tobacco is sold in NZ.

Please read the following statements below before agreeing to take part by signing below.

1. I have read the Information Sheet and understand what this study is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.
2. My participation in the project is entirely voluntary. I am free to withdraw from the project at any time.
3. Personal identifying information [e.g. recordings of interview] will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for at least five years.
4. The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.

I agree to take part in this project.

.....  
(Signature of participant)

.....  
(Date)

This study has been approved by the University of Otago Human Ethics Committee. If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (ph 03 479 8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.



## Appendix 11. Information sheet for participants in the randomised experimental survey



### Your opinions on buying tobacco

Hello/ Tēna koe

Thank you for clicking through to our survey; it should take you around 10 minutes to complete.

The survey is being conducted by researchers in the Department of Preventive and Social Medicine at the University of Otago in Dunedin.

#### Confidentiality

Please be assured that this survey is completely anonymous. If you have any questions about it, please feel free to email Miss Lindsay Robertson, the main researcher (lindsay.robertson@otago.ac.nz). If you'd like more details about the survey, please read the information page on the next screen.

To go directly to the survey please click on the '>>' button at the bottom of the page. You may click the '<<' button at any stage whilst completing the survey if you wish to go back and change your answers. If you lose your connection to the internet or this survey at any point, please click the link provided in the email you received and it will take you back to the point where you left off.

**Thank you for your participation in this study.**

## Information for participants

Please read this information carefully before deciding whether or not to take part in the survey. If you decide to take part, we thank you sincerely.

### What is aim of the study?

We are exploring different policies that would change the way cigarettes and tobacco are sold in New Zealand. We want to find out what tobacco smokers think of these options, and what effect they think these policies would have on other smokers.

We are asking people to take part in this study if they are aged 18 years and older, and smoke daily or occasionally.

### What will be involved in the survey?

If you agree to take part in this project, you will be asked to complete an online survey that will take around 10 minutes.

We will be collecting information on your views about tobacco policies and how they might affect smokers. The survey is anonymous; information about your gender, age, ethnicity and smoking status will be collected so that we can describe the people who take part in the study. If you would like to receive a copy of the results of our study, we may also collect your email address, though this is completely optional.

### How will the data be used and stored?

All of the information will be stored securely for at least 5 years according to University of Otago policy, and will only be seen by the team directly involved in the research. The results of this research may be published and then used by organisations working in public health.

### Other things you need to know

This survey is entirely voluntary. You may decide not to take part without any disadvantage to yourself.

Some survey questions will require a response before you can continue. However, you may discontinue the survey at any time. You will not be able to review or correct your survey responses after you have finished the survey.

The Department of Preventive and Social Medicine Ethics Committee at the University of Otago has reviewed and approved this project. If you have any concerns about the research you should contact the Committee through the Human Ethics Committee Administrator (ph 03 479 8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

### Need more information?

If you have any questions about our project, either now or in the future, please feel free to contact Ms Lindsay Robertson (l.robertson@otago.ac.nz) from the Department of Preventive and Social Medicine (direct dial: 03 479 7225).

## Appendix 12: Study protocol for survey

Note: This is an example of the version of the survey in Condition A; the policy scenario (shaded grey in this example) varies according to the condition participants were randomly assigned to. Additionally, the order of vignettes was presented randomly so that half of the participants in each study condition received the “Anna” vignette first.

---

### Survey

**First, a few questions to see if you qualify for this survey.**

**Which of these best describes you?**

- A daily tobacco smoker
- A social or occasional tobacco smoker
- A former tobacco smoker who does not smoke now
- A non-smoker of tobacco

**Which of the following do you usually smoke?**

- Mostly manufactured (ready-made, factory-made) cigarettes (tailies)
- Mostly roll your own / loose tobacco (rollies)
- Both manufactured cigarettes and loose tobacco (tailies and rollies)
- A combination of manufactured cigarettes, loose tobacco and / or electronic cigarettes
- I only use electronic cigarettes/ vaping device/ vapouriser

**Are you:**

- Male
- Female

**Which age group are you in?**

- Under 18
- 18-34
- 35-54
- 55 and over

**Thank you. Now to the main part of the survey....**

**First, we would like you to read the information below about a tobacco policy.**

Since 2010, the price of tobacco has been increased each year, on average by about 10%. If this policy continued next year, it would mean:

- the price of 20 budget brand cigarettes would go up from around \$16 to \$17.60,
- a pack of premium brand cigarettes would go up from around \$20 to \$22, and
- a pack of 30g loose tobacco would go up from around \$40 to \$44.

**Now, here is some information about a woman called Anna. We are interested in your opinion on how the tobacco policy described above would affect Anna.**

**Anna:**

Anna is 35 years old and lives with her husband and two children. She works part-time in a cafe in a neighbourhood close to her home. Anna started smoking when she was a teenager and she now smokes around 20 cigarettes a day. She usually goes drinking with friends at a local bar once a week, and when she does this she tends to smoke a lot more. She wishes she had never started smoking, and would really like to quit.

**Please answer the questions below to indicate what effect you think the policy would have on Anna.**

**How would the policy affect Anna's chances of cutting down on smoking?**

- It wouldn't make a difference
- She'd be a little more likely to cut down
- She'd be somewhat more likely to cut down
- She'd be much more likely to cut down

**How would it affect Anna's chances of making a quit attempt?**

- It wouldn't make a difference
- She'd be a little more likely to try to quit
- She'd be somewhat more likely to try to quit
- She'd be much more likely to try to quit

**If Anna did quit successfully, how would the policy affect her chances of staying smokefree?**

- It wouldn't make a difference
- She'd be a little more likely to stay smokefree
- She'd be somewhat more likely to stay smokefree
- She'd be much more likely to stay smokefree

**Now we'd like you to think how this policy might affect a girl called Rose.**

**First, here is the policy again:**

Since 2010, the price of tobacco has been increased each year, on average by about 10%. If this policy continued next year, it would mean:

- the price of 20 budget brand cigarettes would go up from around \$16 to \$17.60,
- a pack of premium brand cigarettes would go up from around \$20 to \$22, and
- a pack of 30g loose tobacco would go up from around \$40 to \$44.

**And now here is some information about Rose:**

**Rose:**

Rose is 15 years old and lives with her parents and two sisters. She goes to a high school in a neighbourhood close to her home and enjoys listening to music and socialising with her friends in her spare time. Some of her friends smoke cigarettes. Rose has never tried smoking before, but her friends keep offering her cigarettes. She thinks she will probably try one sometime soon.

**Please answer the questions below to indicate what effect you think the policy would have on Rose.**

**How would this policy affect Rose's chances of being offered a cigarette?**

- It wouldn't make a difference
- She'd be a little less likely to be offered a cigarette
- She'd be somewhat less likely to be offered a cigarette
- She'd be much less likely to be offered a cigarette

**How would it affect Rose's chances of trying a cigarette?**

- It wouldn't make a difference
- She'd be a little less likely to try a cigarette
- She'd be somewhat less likely to try a cigarette
- She'd be much less likely to try a cigarette

**How would this policy affect Rose's chances of becoming a regular smoker?**

- It wouldn't make a difference
- She'd be a little less likely to become a regular smoker
- She'd be somewhat less likely to become a regular smoker
- She'd be much less likely to become a regular smoker

We would now like you to think about your own smoking.

How do you think this policy would affect your smoking patterns (e.g. cutting down, trying to quit, or staying smokefree)?

- It wouldn't make a difference
- I'd be a little more likely to cut down or quit
- I'd be somewhat more likely to cut down or quit
- I'd be much more likely to cut down or quit

Now a few more questions about your own smoking.

Have you smoked more than 100 cigarettes in total in your lifetime?

- Yes
- No

**On a typical day, how many cigarettes do you smoke? (daily smokers only)**

- 10 or fewer
- 11 – 20
- 21– 30
- 30 or more

**During the past week, how many cigarettes did you smoke? (occasional/ social smokers only)**

- 10 or fewer
- 11 – 20
- 21 – 30
- 30 or more

**How soon after waking do you usually smoke your first cigarette?**

- Less than 5 minutes
- 5 to 30 minutes
- 31 to 60 minutes
- More than 60 minutes

**During the past 6 months, how many quit attempts (lasting 24 hours or more) have you made?**

- None
- 1 – 2
- 3 – 5
- 6 or more

**On average, how often do you buy tobacco or cigarettes?**

- Daily
- Almost every day
- 2 or 3 times a week
- Once a week

- Once every 2 or 3 weeks
- Once a month or less
- No regular pattern
- Never

How often do you usually buy tobacco or cigarettes from a supermarket?

- Always
- Usually
- Sometimes
- Rarely
- Never

How often do you usually buy tobacco or cigarettes from a service station or petrol station?

- Always
- Usually
- Sometimes
- Rarely
- Never

How often do you usually buy tobacco or cigarettes from a dairy/ convenience store/ corner store?

- Always
- Usually
- Sometimes
- Rarely
- Never

How often do you usually buy tobacco or cigarettes in a bar, pub, tavern or nightclub?

- Always
- Usually
- Sometimes
- Rarely
- Never

How often do you usually buy tobacco or cigarettes from a liquor store or bottle shop?

- Always
- Usually
- Sometimes
- Rarely
- Never

How often do you usually buy tobacco or cigarettes from a tobacconist (e.g. a store that specialises in selling tobacco products)?

- Always
- Usually
- Sometimes
- Rarely
- Never

**Have you heard of the government's 2025 smokefree goal?**

- Yes
- No

The government has a goal of making New Zealand smokefree by 2025. The goal is: To reduce smoking rates and tobacco sales to minimal levels, so that less than 5% of people smoke (in all population groups).

Do you support or oppose this goal or do you have no preference either way?

- Support the 2025 goal
- Oppose the 2025 goal
- Have no preference either way

**Finally, some quick questions about yourself...**

**In what year were you born?**

.....

**Which ethnic groups do you belong to? Please tick all that apply.**

- NZ European
- Maori
- Samoan
- Cook Island Maori
- Tongan
- Niuean
- Chinese
- Indian
- Other (please specify)



**What is your highest educational qualification?**

- No formal qualification
- School qualifications (school certificate, NCEA, UE, bursary)
- Certificate, diploma, or professional qualification (e.g. trades)
- Bachelor's degree
- Postgraduate qualification

**Thank you for taking the time to complete this survey.**

If you feel you would like more information or support regarding quitting smoking, you can get to the Quitline website by clicking: <http://www.quitline.co.nz>

Would like to receive feedback via email on the results of this study once it is completed? This will be sent to you via ResearchNow.

- Yes
- No

Appendix 13. Statistically significantly factors associated with perceiving a policy as “effective” for susceptible never-smoker vignette

Predictor variable	Policy conditions					
	P1	P2	P3	P4	P5	P6
Age (years)						
18-35	Ref	Ref	Ref	Ref	Ref	Ref
36-54	-	-	-	-	-	<b>5.40 (1.67 – 17.44)**</b>
55 +	<b>5.88 (1.46 - 23.70)*</b>	-	-	-	-	-
Sex						
Male	Ref	Ref	Ref	Ref	Ref	Ref
Female	-	-	-	-	-	-
Ethnicity						
NZ European	Ref	Ref	Ref	Ref	Ref	Ref
Asian	-	-	-	-	<b>11.16 (1.63 – 76.29)*</b>	-
Pacific Island	-	-	-	-	-	-
Maori	-	-	-	-	-	-
Other/ missing	-	-	-	-	-	-
European	-	-	-	-	-	-
Highest education level						
None	Ref	Ref	Ref	Ref	Ref	Ref
School qualification	-	-	-	-	-	-
Certificate/equivalent	-	-	-	-	-	-
Degree or higher	<b>0.18 (0.33 – 0.98)*</b>	-	-	-	-	-
Heaviness of Smoking						
Light	Ref	Ref	Ref	Ref	Ref	Ref
Moderate	-	-	-	-	-	-
Heavy	-	-	-	-	-	-
Recent quit attempt						
No	Ref	Ref	Ref	Ref	Ref	Ref
Yes	-	-	-	-	-	-
Supports 2025 goal						
No	Ref	Ref	Ref	Ref	Ref	Ref
Yes	-	-	-	-	-	<b>6.96 (2.08 – 23.29)**</b>

Coefficients in bold are adjusted odds ratios (95% Confidence Intervals) \*p<0.05 \*\*p< 0.01

Appendix 14. Statistically significantly factors associated with perceiving a policy as “effective” for adult smoker vignette

Predictor variable	Policy conditions					
	P1	P2	P3	P4	P5	P6
Age (years)						
18-35	Ref	Ref	Ref	Ref	Ref	Ref
36-54	-	-	-	-	-	-
55 +	-	-	-	-	-	-
Sex						
Male	Ref	Ref	Ref	Ref	Ref	Ref
Female	-	-	-	-	-	-
Ethnicity						
NZ European	Ref	Ref	Ref	Ref	Ref	Ref
Asian	-	-	-	-	-	-
Pacific Island	-	-	-	-	-	-
Maori	-	-	-	-	-	-
Other/ missing	-	-	-	-	-	-
European	-	-	-	-	-	-
Highest education level						
None	Ref	Ref	Ref	Ref	Ref	Ref
School qualification	<b>0.15 (0.03 – 0.68)*</b>	-	-	-	-	-
Certificate/equivalent	-	-	-	-	-	-
Degree or higher	-	-	-	-	-	-
Heaviness of Smoking						
Light	Ref	Ref	Ref	Ref	Ref	Ref
Moderate	-	-	-	-	-	<b>0.22 (0.07 – 0.69)**</b>
Heavy	-	-	-	-	-	-
Quit attempt past 6 months						
No	Ref	Ref	Ref	Ref	Ref	Ref
Yes	-	<b>4.02 (1.37 – 11.79)*</b>	-	-	-	-
Supports 2025 goal						
No	Ref	Ref	Ref	Ref	Ref	Ref
Yes	-	-	-	-	-	-

Coefficients in bold are adjusted odds ratios (95% Confidence Intervals) \*p<0.05 \*\*p< 0.01