

Brief Report

Smoker interest in lower harm alternatives to cigarettes: National survey data

Nick Wilson, Ron Borland, Deepa Weerasekera, Richard Edwards, & Marie Russell

Abstract

Introduction: The aim of this study was to examine knowledge and attitudes to lower harm alternatives to cigarettes among New Zealand (NZ) smokers.

Methods: The NZ arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) utilizes the NZ Health Survey (a national sample). From this sample, we surveyed adult smokers ($N = 1,376$).

Results: Knowledge about smokeless tobacco was poor, with only 16% regarding such products as less harmful than ordinary cigarettes. Only 7% considered such products to be “a lot less” harmful. When participants were asked to assume that these products were much less harmful than cigarettes, 34% of smokers stated that they would be interested in trying smokeless tobacco products, with another 11% saying “maybe” or “don’t know.” In the multivariate analysis, Māori smokers were significantly more interested in trying smokeless products than Europeans in all 3 models considered (e.g., Model 1: adjusted odds ratio [AOR] = 1.71, 95% CI = 1.23–2.37). There was also significantly increased interest for those concerned about the impact of smoking on health and quality of life in the future (AOR = 1.44, 95% CI = 1.17–1.78). But interest did not vary significantly by 2 measures of socioeconomic status and varied inconsistently by 2 measures of financial stress.

Discussion: The finding that one third of smokers said that they would be interested in trying smokeless products suggests that these products could have a role as part of a tobacco epidemic endgame that phases out smoked tobacco. Differences in interest level by ethnic group may be relevant to stimulating further work in this area (e.g., among those health workers concerned for smokers with the highest need to quit).

Introduction

In addition to intensifying major existing tobacco control approaches (e.g., higher taxation and expanding quitting support), a range of more structural tobacco endgame solutions has been proposed (Borland, 2003; Callard, Thompson, & Collishaw, 2005). Within New Zealand (NZ), Māori leaders have made calls to eventually make cigarette sales illegal (Gifford & Bradbrook, 2009), and a broad coalition of nongovernment agencies is working on a vision for a tobacco-free NZ by 2020. Part of this approach might be a policy to incrementally increase regulation over the sale of tobacco products, culminating in a ban on cigarette sales—for example, over a 10-year period. As part of this strategy, smokers who are unable to quit during the lead-in to a ban could be encouraged to switch temporarily to less harmful forms of tobacco (such as oral snuff like that used in Sweden [Hall & Gartner, 2009], other nicotine delivery devices such as “e-cigarettes,” or pharmaceutical nicotine replacement products). Indeed, there have been arguments in NZ to promote switching from cigarettes to snuff (Laugesen, 2007), as well as product safety research on some novel nicotine products—for example, the *Ruyan* e-cigarette (Laugesen, Thornley, McRobbie, & Bullen, 2008) and a metered-dose nicotine inhaler (Caldwell et al., 2009). However, there is active debate, based particularly on differing interpretations of the Swedish experience, about whether introducing low-nitrosamine smokeless tobacco products to markets like NZ and most of the European Union (where they are currently banned from sale) will produce net public health benefit or harm (Bates et al., 2003; Foulds, Ramstrom, Burke, & Fagerstrom, 2003; Gilmore, Britton, Arnott, Ashcroft, & Jarvis, 2009; McKee & Gilmore, 2007; Ramstrom & Foulds, 2006; Tomar, Connolly, Wilkenfeld, & Henningfield, 2003; Zhu et al., 2009).

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Leaving aside arguments about whether the net impact on public health of increased use of oral tobacco products and other nontobacco nicotine delivery devices would be positive or negative, another issue is how existing smokers view these products and to what degree they are likely to use them. Therefore, to further inform considerations about the possible role of harm reduction tobacco products as part of a tobacco epidemic end-game solution, we examined knowledge and attitudes to these products in a national survey of NZ smokers. In this country, oral snuff is illegal to sell, and tobacco companies have not promoted nasal snuff or other harm reduction products (i.e., all tobacco advertising is illegal other than on the packaging).

Methods

The ITC Project

The International Tobacco Control Policy Evaluation Survey (ITC Project) is a multicountry study on tobacco use epidemiology and tobacco control policy evaluation. A full description of the ITC Project conceptual framework and methods has been published elsewhere (Fong et al., 2006; Thompson et al., 2006). The NZ arm of the ITC Project differs somewhat in that the smokers involved are from the sample frame of the nationally representative NZ Health Survey (NZHS). Respondents for the NZHS were selected by a complex sample design, which included systematic boosted sampling of the Māori, Pacific, and Asian populations. Interviews were conducted face-to-face in respondents' homes by trained interviewers (on contract to the Ministry of Health) and resulted in a total of 11,924 interviews with respondents aged 18 years and older. The overall response rate was 67.9%. For full details of the methods of this survey, see the report on the key results (Ministry of Health, 2008b) and a detailed *Methods Report* (Ministry of Health, 2008a).

Participants

From the NZHS sample, we had an additional sampling frame of adult smokers who were aged 18 years and older and who were willing to participate in further research when asked this at the end of the NZHS interview (this was 85.2% of the adult smokers in the NZHS). Of 2,438 potential respondents who met these criteria, a total of 1,376 completed a telephone questionnaire, giving a response rate of 56.4% (see an online *Methods Report* [Wilson, 2009] for more details).

Measures

The key question we analyzed (Table 1) was "Suppose some smokeless tobacco products are proven to be 'a lot less' harmful than cigarettes. Would you be/Are you/interested in trying them as an alternative to cigarettes?" Other measures included socioeconomic status (SES), which was assessed using a small area-based SES score developed for NZ (NZDep). In particular, NZDep2006 measures the level of socioeconomic deprivation for each neighborhood (meshblock) according to a combination of the following 2006 Census variables: income, benefit receipt, transport (access to car), household crowding, home ownership, employment status, qualifications, support (sole-parent families), and access to a telephone (Salmond, Crampton, & Atkinson, 2007). This index has been used in many published articles and reports, and the predecessors of NZDep2006 (NZDep91, NZDep96, and NZDep2001) have been extensively

validated (White, Gunston, Salmond, Atkinson, & Crampton, 2008). We also used an individual-level deprivation score created for the NZ setting (NZiDep; Table 1). Although NZDep2006 and NZiDep are weakly correlated in our sample (Pearson's correlation coefficient, $r = .26$, $p < .001$), these are conceptually quite different measures (Salmond, Crampton, King, & Waldegrave, 2006). We also had two measures of financial stress (see Table 1), which are also correlated with each other (and the SES measures; Wilson, 2009) but involve significant conceptual differences (Siahpush, Borland, & Yong, 2007; Siahpush, Yong, Borland, Reid, & Hammond, 2009). Indeed, all these variables could still be collectively included in the multivariate model without destabilizing the model with intercorrelation.

Weighting and statistical analyses

Weighting of the results was necessary, given the sampling design (e.g., boosted sampling of Māori, Pacific peoples, and Asians in the NZHS) and nonresponse for the NZHS and ITC Project. A full description of the weighting process is detailed in an online report (Clark, 2008).

Univariate analysis of the key socioeconomic and smoking variables was initially conducted, and we also carried out a multivariate logistic regression analysis. The latter used a conceptual framework, which assumed that there would be hierarchical relationships between demographic and sociodemographic factors (Victora, Huttly, Fuchs, & Olinto, 1997), that would dominate over smoking-related behaviors and beliefs. All models included age, gender, and ethnicity, and Models 2–4 included key sociodemographic variables (e.g., SES, financial stress). Model 3 added in key smoking-related beliefs and behavior, and Model 4 considered each SES variable on its own. Nevertheless, given the novelty of smokeless products for NZ smokers (since such products have no market presence), we did not include perceptions of smokeless product harmfulness in the multivariate model.

All analyses were conducted in Stata (version 10; Stata-Corp, College Station, TX), and all the presented results were weighted and adjusted for the complex sample design of the NZHS to make the sample representative of all NZ smokers.

Results

The results indicate that knowledge of the relative health impacts of smokeless tobacco was relatively poor, with only 15.7% (95% $CI = 13.0$ – 18.5) regarding such products as either "a little less" or "a lot less" harmful than ordinary cigarettes (8.1% and 7.2%, respectively). A similar proportion (15.9%) had never heard of smokeless tobacco products.

When participants were asked to assume that these products were much less harmful than cigarettes, 34.8% of smokers stated that they would be interested in trying these products, with another 11.1% saying "maybe" or "don't know" (Table 1). In the univariate analysis, the proportion expressing interest was higher in each ethnic group compared with Europeans but was statistically significant only for Māori (40.2% vs. 32.6%; odds ratio [OR] = 1.58, 95% $CI = 1.16$ – 2.16). While there was no significant association between two different deprivation

Table 1. Interest among smokers in trying smokeless tobacco products by sociodemographic characteristics (all results weighted and adjusted for the complex design)

Variable	“Yes” (interested; row %)	“Maybe” (row %)	“No” ^a (row %)	Crude OR for interest (“yes” relative to “no”; 95% CI)
Total (N = 1,350)	34.8	11.1	54.2	—
Age ^b (years)				
18–24 (n = 146)	34.6	13.2	52.2	1.00 Referent
25–34 (n = 330)	31.1	8.8	60.1	0.78 (0.44–1.39)
35–44 (n = 348)	37.1	13.3	49.6	1.13 (0.65–1.98)
45–54 (n = 287)	32.4	10.5	57.1	0.86 (0.48–1.53)
55+ (n = 239)	39.7	10.0	50.3	1.19 (0.67–2.13)
Gender ^b				
Male (n = 517)	35.0	9.8	55.2	1.00 Referent
Female (n = 833)	34.5	12.4	53.1	1.02 (0.75–1.39)
Ethnicity ^c				
European (includes Other; n = 607)	32.6	9.3	58.1	1.00 Referent
Māori (n = 595)	40.2	14.7	45.1	1.58 (1.16–2.16)
Pacific (n = 90)	36.2	11.1	52.6	1.22 (0.69–2.17)
Asian (n = 58)	35.6	19.0	45.4	1.40 (0.61–3.22)
Small area deprivation level (NZDep2006, quintiles) ^b				
1 and 2 (least deprived; n = 117)	40.8	8.3	50.9	1.00 Referent
3 and 4 (n = 202)	28.1	9.2	62.7	0.56 (0.30–1.05)
5 and 6 (n = 236)	29.1	9.6	61.3	0.59 (0.32–1.10)
7 and 8 (n = 301)	31.1	15.3	53.6	0.73 (0.40–1.31)
9 and 10 (most deprived; n = 494)	43.2	10.7	46.1	1.17 (0.67–2.05)
Individual deprivation (NZiDep scores) ^b				
0, i.e., least deprived individuals (n = 616)	36.1	9.7	54.2	1.00 Referent
1 (n = 248)	30.2	10.8	59.0	0.77 (0.51–1.17)
2 (n = 170)	27.6	12.8	59.6	0.69 (0.41–1.17)
3–4 (n = 190)	38.4	10.3	51.3	1.12 (0.69–1.83)
5–8, i.e., most deprived individuals (n = 125)	42.2	20.3	37.5	1.69 (0.98–2.90)
1–8 (any deprivation; n = 733)	33.3	12.5	54.2	0.92 (0.68–1.25)
Financial stress				
Unable to pay any important bills on time—“yes” (n = 112; referent = “no”)	37.4	13.5	49.1	1.20 (0.66–2.17)
Not spending on household essentials ^d —“yes” (n = 371; referent = “no”)	42.8	10.3	46.9	1.58 (1.12–2.23)

Note. OR = odds ratio.

^aIncludes those who contested the proposition (i.e., they did not believe that such products existed), and all results exclude those who responded “don’t know” (n = 26).

^bBased on New Zealand Health Survey data with age; data were collected a few months prior to the International Tobacco Control Policy Evaluation Survey. For further information on the deprivation measures, see the Methods section and an online *Methods Report* (Wilson, 2009).

^cEthnicity results are for prioritized ethnicity where all those with Māori or both Māori and other ethnic affiliations were classified as Māori, where all those with Pacific and other ethnic affiliations were classified as Pacific (unless Māori affiliation was also reported) and so on (for more detail, see an online *Methods Report* [Wilson, 2009]).

^dMore specifically, this was based on the question: “In the last six months, have you spent money on cigarettes that you knew would be better spent on household essentials like food?” For more detail, see an online *Methods Report* (Wilson, 2009) and other published work using this question (Siahpush et al., 2007).

measures and one measure of financial stress, those reporting having spent money on cigarettes “that you knew would be better spent on household essentials like food” were also more interested in trying smokeless products than the other respondents (OR = 1.58, 95% CI = 1.12–2.23).

Associations with interest in trying smokeless tobacco products were considered further in multivariate logistic regression analysis (Table 2). This found that Māori remained significantly more interested in trying smokeless products in all three models (e.g., adjusted OR = 1.71, 95% CI = 1.23–2.37 in Model 1).

Table 2. Logistic regression analysis of “interest among smokers in trying smokeless tobacco products” by sociodemographic and other characteristics (all results weighted and adjusted for the complex design)

Variables	AOR (95% CI) ^a			
	Model 1 (demographics)	Model 2 (+ sociodemographics)	Model 3 (+ smoking beliefs and behavior)	Model 4 (Model 3 but with each sociodemographic variable considered in isolation)
Demographic				
Age (years)				
35–49 vs. <35	1.20 (0.83–1.74)	1.16 (0.80–1.69)	1.15 (0.75–1.75)	Variable ^b
50+ vs. <35	1.49 (0.99–2.25)	1.47 (0.97–2.24)	1.37 (0.85–2.22)	Variable ^b
Gender				
Women vs. men	0.99 (0.72–1.36)	1.05 (0.77–1.45)	0.93 (0.65–1.34)	Variable ^b
Māori vs. European	1.71 (1.23–2.37)	1.58 (1.13–2.22)	1.51 (1.04–2.20)	Variable ^b
Pacific vs. European	1.32 (0.74–2.38)	1.11 (0.61–2.01)	1.17 (0.52–2.61)	Variable ^b
Asian vs. European	1.57 (0.67–3.67)	1.87 (0.84–4.15)	2.47 (0.96–6.37)	Variable ^b
Sociodemographic^c				
Area deprivation quintiles (increasing deprivation)	—	1.08 (0.95–1.23)	1.06 (0.91–1.23)	1.05 (0.91–1.21)
Individual deprivation using NZiDep (any deprivation vs. nil)	—	0.85 (0.60–1.19)	0.76 (0.53–1.11)	0.80 (0.56–1.15)
Financial stress: Unable to pay any important bills on time	—	1.21 (0.70–2.10)	1.08 (0.58–2.00)	1.08 (0.59–1.97)
Financial stress: Not spending on household essentials	—	1.50 (1.04–2.15)	1.12 (0.73–1.73)	1.11 (0.73–1.69)
Smoking behavior and beliefs				
Heaviness of smoking index (alternate version) ^d	—	—	1.03 (0.95–1.12)	Variable ^b
Concern around smoking impact on health and quality of life in the future (2-item scale) ^e	—	—	1.44 (1.17–1.78)	Variable ^b
Strength of intention of quitting (4-point scale) ^f	—	—	0.99(0.82–1.21)	Variable ^b

Note. AOR = adjusted odds ratio.

^aThe AORs represent those saying “yes” to interest (see Table 1) relative to “no” and excluding those in the “maybe/don’t know” group (though those who “contest the proposition” were included in the “no” group). The AORs in Models 2, 3, and 4 are adjusted for the demographic and key sociodemographic variables (i.e., deprivation), Model 3 for smoking behavior and beliefs, and Model 4 considers each SES measure and financial stress measure separately (see the Methods section).

^bIn this model, each sociodemographic variable was considered in isolation from the other deprivation and financial stress variables. The results for the other variables are not shown, as these varied for each analysis.

^cSee Methods section for further details on these measures.

^dThe “Heaviness of Smoking Index” has been developed by others, and we used the “alternative version” utilized by others (Borland et al., 2004). This is calculated as the square root of the daily cigarette consumption minus the natural logarithm of time to first cigarette of the day. The specific equations are detailed in an online *Methods Report* (Wilson, 2009).

^eThe “concern around smoking impact” scale was based on the following two questions: (i) “How worried are you, if at all, that smoking WILL damage YOUR health in the future?” and (ii) “How worried are you, if at all, that smoking WILL lower your quality of life in the future?” For both these questions, the response options were: “Not at all worried,” “A little worried,” “Moderately worried,” “Very worried,” “Refused,” and “Can’t Say.” The Cronbach’s alpha for this scale was relatively high ($\alpha = 0.78$).

^fThe “concern strength of intention of quitting” scale has been used by other ITC Project workers (Young et al., 2007). The question was: “Now we would like to ask you some questions on any thoughts you might have had about quitting smoking. IF you decided to give up smoking completely in the next 6 months, how sure are you that you would succeed?” The response options were: “Within the next month”; “Within the next 6 months”; “Sometime in the future, beyond 6 months”; “Or are you not planning to quit”; “Refused”; and “Can’t Say.”

However, the association with “financial stress” (relating to not spending on household essentials) remained significant in only one of the models (i.e., it was no longer significant after adjustment for smoking-related beliefs and behavior in Model 3). In

the fully adjusted model, the only significant associations with interest in trying smokeless products were being Māori and having concerns about the current or future impact of smoking on health and quality of life (Model 4).

Discussion

These results suggest that NZ smokers are poorly informed about the lower health hazard posed by smokeless tobacco compared with cigarettes. Indeed, only 7% considered such products to be a lot less harmful, which appears to be the scientific consensus view (Levy et al., 2004). That smokers are poorly informed on this relative hazard has also been reported in Norway (Overland, Hetland, & Aaro, 2008) and in Sweden (Ramstrom & Wikmans, 2008), where use of such products is common (Foulds et al., 2003). Another ITC Project study (in four countries) found that only 13% of smokers (of those aware of smokeless products) considered smokeless tobacco less hazardous than cigarettes (O'Connor et al., 2007).

Nevertheless, a new finding in this study that has not yet been reported is the degree of interest of smokers in trying such products. That is, one third of the NZ smokers said that they would be interested in trying such products (if proven less harmful). This suggests that these products may have a role as part of a tobacco epidemic endgame option (i.e., one that encouraged switching from smoked products and that eventually made smoked tobacco sales illegal), assuming that such interest translated into actual behavior if the products were available and they were priced according to their relative harm (e.g., by a lower tax level).

There were groups who expressed relatively more interest in trying smokeless products, that is, Māori, those with particular concerns about the future impact of smoking on their health and quality of life, and those reporting one form of financial stress (albeit in one model). It is possible that the latter two variables relate to interest in smokeless as a way to quit or to cut down consumption. Other work using this particular measure of financial stress “not spending on household essentials” found it to be associated with quitting intention but not with self-efficacy of quitting or with quitting outcomes (Siahpush et al., 2007). But for the other measure of such stress (not being able to pay important bills on time), which has also been associated with quitting intention (Siahpush et al., 2009), we found no association with interest in trying smokeless products in the multivariate analysis. Therefore, other mechanisms might be relevant, including the possibility that those with more financial stress might be looking for an alternative tobacco product to allow for continuing nicotine access at lower cost.

The finding of higher Māori interest is harder to interpret. It may be related to aspects of the relatively disadvantaged position of Māori in NZ society (i.e., not fully captured by adjusting for SES and financial stress), and/or it may reflect a response to the increased focus by the health sector on encouraging educating whanau (families) about secondhand smoke, mass-media campaigns for a Māori audience (Grigg, Waa, & Bradbrook, 2008), and national-level Māori advocacy for tobacco control (Gifford & Bradbrook, 2009). Of note, however, is that some of this advocacy has shifted from a “smoke-free” message to the broader “tobacco-free” (tupeka kore) message, which includes a *rejection* of smokeless tobacco products as well. Māori smoking prevalence is relatively much higher than that for other New Zealanders (Ministry of

Health, 2009), and so it is also plausible that there are unique aspects to Māori smoking that are stimulating interest in harm reduction.

If there is to be progress toward the goal of a smoke-free NZ, research is needed to assess the potential utility of alternatives to smoked tobacco within an endgame tobacco control strategy. Such products must include medicinal nicotine, and might include smokeless tobacco and new innovations like e-cigarettes (Laugesen et al., 2008). Differences in the acceptability of options by socioeconomic group may be an important determinant, of which alternatives need to be provided, as will their safety profile, role in promoting quitting of smoked tobacco products, and their addictiveness. New Zealand policymakers are probably some way from accepting smokeless tobacco as a potential part of the solution. Among other things, changes to legislation would be required, as some of these products cannot currently be legally sold in NZ (i.e., oral snuff is illegal, though nasal snuff is legal). If they are to be part of the solution, innovative regulatory options such as re-design of the tobacco market to constrain the tobacco industry (Borland, 2003; Callard et al., 2005) might be mechanisms to ensure that the industry does not use these products to subvert public health goals, as some have suggested might occur (Carpenter, Connolly, Ayo-Yusuf, & Wayne, 2009). While the research base is developing and the debate about endgames continues, tobacco control workers should continue to pursue the major established tobacco control interventions, which NZ still uses at below full potential (Wilson, Thomson, & Edwards, 2008).

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References

- Bates, C., Fagerstrom, K., Jarvis, M. J., Kunze, M., McNeill, A., & Ramstrom, L. (2003). European Union policy on smokeless tobacco: A statement in favour of evidence based regulation for public health. *Tobacco Control*, *12*, 360–367.
- Borland, R. (2003). A strategy for controlling the marketing of tobacco products: A regulated market model. *Tobacco Control*, *12*, 374–382.
- Borland, R., Yong, H. H., King, B., Cummings, K. M., Fong, G. T., Elton-Marshall, T., et al. (2004). Use of and beliefs about light cigarettes in four countries: Findings from the International Tobacco Control Policy Evaluation Survey. *Nicotine & Tobacco Research*, *6*(Suppl. 3), S311–S321.
- Caldwell, B., Dickson, S., Burgess, C., Siebers, R., Mala, S., Parkes, A., et al. (2009). A pilot study of nicotine delivery to smokers from a metered-dose inhaler. *Nicotine & Tobacco Research*, *11*, 342–347.
- Callard, C., Thompson, D., & Collishaw, N. (2005). Transforming the tobacco market: Why the supply of cigarettes should be transferred from for-profit corporations to non-profit enterprises with a public health mandate. *Tobacco Control*, *14*, 278–283.
- Carpenter, C. M., Connolly, G. N., Ayo-Yusuf, O. A., & Wayne, G. F. (2009). Developing smokeless tobacco products for smokers: An examination of tobacco industry documents. *Tobacco Control*, *18*, 54–59.
- Clark, R. (2008). *Summary of method for calculating estimation weights for Wave 1 of the 2007 International Tobacco Control Policy Evaluation Project (ITC)—New Zealand Arm*. Wollongong, Australia: University of Wollongong Centre for Statistical and Survey Methodology. Retrieved September 29, 2009, from <http://www.wnmeds.ac.nz/academic/dph/research/HIRP/Tobacco/itcproject.html>
- Fong, G. T., Cummings, K. M., Borland, R., Hastings, G., Hyland, A., Giovino, G. A., et al. (2006). The conceptual framework of the International Tobacco Control (ITC) Policy Evaluation Project. *Tobacco Control*, *15*(Suppl. 3), iii3–iii11.
- Foulds, J., Ramstrom, L., Burke, M., & Fagerstrom, K. (2003). Effect of smokeless tobacco (snus) on smoking and public health in Sweden. *Tobacco Control*, *12*, 349–359.
- Gifford, H., & Bradbrook, S. (2009). *Recent actions by Māori politicians and health advocates for a tobacco-free Aotearoa/New Zealand, A brief review (Occasional Paper 2009/1)*. Wellington, New Zealand: Whakauae Research Services; Te Reo Mārama; Health Promotion and Public Health Policy Research Unit (HePPRU). Retrieved September 29, 2009, from <http://www.wnmeds.ac.nz/academic/dph/research/HIRP/Tobacco/Maori%20tobacco%20control%20review%20-%20Occasional%20Paper%20Feb%202009.pdf>
- Gilmore, A. B., Britton, J., Arnott, D., Ashcroft, R., & Jarvis, M. J. (2009). The place for harm reduction and product regulation in UK tobacco control policy. *Journal of Public Health (Oxford, England)*, *31*, 3–10.
- Grigg, M., Waa, A., & Bradbrook, S. K. (2008). Response to an indigenous smoking cessation media campaign—it's about whanau. *Australian and New Zealand Journal of Public Health*, *32*, 559–564.
- Hall, W., & Gartner, C. (2009). Supping with the devil? The role of law in promoting tobacco harm reduction using low nitrosamine smokeless tobacco products. *Public Health*, *123*, 287–291.
- Laugesen, M. (2007). Snuffing out cigarette sales and the smoking deaths epidemic. *New Zealand Medical Journal*, *120*, U2587.
- Laugesen, M., Thornley, S., McRobbie, H., & Bullen, C. (2008). *How safe is an e-cigarette? The results of independent chemical and microbiological analysis*. Christchurch, New Zealand: Health New Zealand. Retrieved September 29, 2009, from <http://www.healthnz.co.nz/Portland2008ECIG.pdf>
- Levy, D. T., Mumford, E. A., Cummings, K. M., Gilpin, E. A., Giovino, G., Hyland, A., et al. (2004). The relative risks of a low-nitrosamine smokeless tobacco product compared with smoking cigarettes: Estimates of a panel of experts. *Cancer Epidemiology, Biomarkers & Prevention*, *13*, 2035–2042.
- McKee, M., & Gilmore, A. (2007). Commentary: Smokeless tobacco: Seeing the whole picture. *International Journal of Epidemiology*, *36*, 805–808.
- Ministry of Health. (2008a). *Methodology Report for the 2006/07 New Zealand Health Survey*. Wellington, New Zealand: Author. Retrieved September 29, 2009, from <http://www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health>
- Ministry of Health. (2008b). *A portrait of health: Key results of the 2006/07 New Zealand Health Survey*. Wellington, New Zealand: Author. Retrieved September 29, 2009, from <http://www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health>
- Ministry of Health. (2009). *Tobacco trends 2008: A brief update of tobacco use in New Zealand*. Wellington, New Zealand: Author. Retrieved September 29, 2009, from [http://www.moh.govt.nz/moh.nsf/pagesmh/9081/\\$File/tobacco-trends-2008.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/9081/$File/tobacco-trends-2008.pdf)
- O'Connor, R. J., McNeill, A., Borland, R., Hammond, D., King, B., Boudreau, C., et al. (2007). Smokers' beliefs about the relative safety of other tobacco products: Findings from the ITC collaboration. *Nicotine & Tobacco Research*, *9*, 1033–1042.
- Overland, S., Hetland, J., & Aaro, L. E. (2008). Relative harm of snus and cigarettes: What do Norwegian adolescents say? *Tobacco Control*, *17*, 422–425.
- Ramstrom, L., & Foulds, J. (2006). Role of snus in initiation and cessation of tobacco smoking in Sweden. *Tobacco Control*, *15*, 210–214.
- Ramstrom, L., & Wikmans, T. (2008, 23–26 September). *Swedish adults' understanding of the health risks of long term use of nicotine replacement products and of using Swedish snus compared to smoking*. Poster presentation at the tenth annual meeting of the European Society for Research on Nicotine and Tobacco, Rome. From <http://www.forskningsgruppen.com/>

- Salmond, C., Crampton, P., & Atkinson, J. (2007). *NZDep2006 index of deprivation*. Wellington, New Zealand: Department of Public Health, University of Otago.
- Salmond, C., Crampton, P., King, P., & Waldegrave, C. (2006). NZiDep: A New Zealand index of socioeconomic deprivation for individuals. *Social Science & Medicine*, *62*, 1474–1485.
- Siahpush, M., Borland, R., & Yong, H. H. (2007). Sociodemographic and psychosocial correlates of smoking-induced deprivation and its effect on quitting: Findings from the International Tobacco Control Policy Evaluation Survey. *Tobacco Control*, *16*, e2.
- Siahpush, M., Yong, H. H., Borland, R., Reid, J. L., & Hammond, D. (2009). Smokers with financial stress are more likely to want to quit but less likely to try or succeed: Findings from the International Tobacco Control (ITC) Four Country Survey. *Addiction*, *104*, 1382–1390.
- Thompson, M. E., Fong, G. T., Hammond, D., Boudreau, C., Driezen, P., Hyland, A., et al. (2006). Methods of the International Tobacco Control (ITC) Four Country Survey. *Tobacco Control*, *15*(Suppl. 3), iii12–iii18.
- Tomar, S. L., Connolly, G. N., Wilkenfeld, J., & Henningfield, J. E. (2003). Declining smoking in Sweden: Is Swedish Match getting the credit for Swedish tobacco control's efforts? *Tobacco Control*, *12*, 368–371.
- Victora, C. G., Huttly, S. R., Fuchs, S. C., & Olinto, M. T. (1997). The role of conceptual frameworks in epidemiological analysis: A hierarchical approach. *International Journal of Epidemiology*, *26*, 224–227.
- White, P., Gunston, J., Salmond, C., Atkinson, J., & Crampton, P. (2008). *Atlas of socioeconomic deprivation in New Zealand NZDep2006* (3rd ed.). Wellington, New Zealand: Ministry of Health. Retrieved September 29, 2009, from [http://www.moh.govt.nz/moh.nsf/pagesmh/8066/\\$File/NZDep2006_text.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/8066/$File/NZDep2006_text.pdf)
- Wilson, N. (2009). *Methods report for the New Zealand arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) (Updated 2009)*. Wellington, New Zealand: University of Otago. Retrieved September 29, 2009, from <http://www.wnmeds.ac.nz/itcproject.html>
- Wilson, N., Thomson, G., & Edwards, R. (2008). Use of four major tobacco control interventions in New Zealand: A review. *New Zealand Medical Journal*, *121*, 71–86.
- Young, D., Borland, R., Siahpush, M., Hastings, G., Fong, G. T., & Cummings, K. M. (2007). Australian smokers support stronger regulatory controls on tobacco: Findings from the ITC Four-Country Survey. *Australian and New Zealand Journal of Public Health*, *31*, 164–169.
- Zhu, S. H., Wang, J. B., Hartman, A., Zhuang, Y., Gamst, A., Gibson, J. T., et al. (2009). Quitting cigarettes completely or switching to smokeless tobacco: Do US data replicate the Swedish results? *Tobacco Control*, *18*, 82–87.