

Cigarette Package Placement at Outdoor Bars/Cafés in Wellington in the Period Prior to Plain Packaging Legislation (2014)

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Abstract

Introduction: The New Zealand Government is currently developing plain packaging legislation for tobacco products so as to reduce pack-related marketing and to reduce the attractiveness of packs to youth and existing smokers. This study aimed to collect baseline data on tobacco packs displayed in outdoor areas of hospitality venues, as well as other aspects of smoking behaviour.

Methods: The study method replicated that of a published Australian study. Observational data was systematically collected on cigarette pack orientation and smoking by patrons at venues with outdoor tables. A total of 55 venues and 2971 venue observations were performed in March 2014 in the central business district of Wellington. An inter-rater reliability study indicated high levels of inter-observer reliability.

Results: Data were collected on a total of 19,189 patrons, 1707 tobacco packs and 1357 active smokers. One tobacco pack was displayed per 11.2 patrons, with an overall active smoking prevalence of 7.2%. The majority (80%) of packs were positioned face-up (showing the brand), 8.3% face-down (showing the large pictorial warning), 5.7% concealed, 1.8% upright or on the side and 1.7% in a case or tin. Pack display was significantly greater in areas with no child patrons (11.4% compared to 3.7% of patrons, RR = 3.09, 95%CI = 2.68 – 3.56, $p < 0.0001$). A waterfront area was found to have significantly lower levels of smoking per patron than the two other areas. Most of the results were similar to those found in the Australian study with the same methodology (prior to plain packaging being introduced).

Conclusions: This study provides baseline data for the future evaluation of plain packaging in New Zealand. It also identified a number of other results that may warrant further research, particularly the reasons for lower levels of pack display and smoking when children were present.

Introduction

The World Health Organization (WHO) has identified tobacco use as the leading cause of preventable deaths worldwide, killing nearly 6 million people annually and costing hundreds of billions of dollars in avoidable health-care expenditure.(2) In New Zealand, tobacco causes an estimated 5,000 deaths per year.(3) There is also evidence that tobacco marketing is part of the problem by contributing to increased tobacco consumption.(4) Subsequently, the regulation of this marketing is considered a worthwhile method to prevent tobacco-related deaths.(2,4)

An example of effective means of tobacco advertising is point-of-purchase (POP) display.(5) Tobacco displays behind the counter influence unplanned purchases almost four times as much as planned purchases.(5) POP advertising prompts smokers, including those intending to quit, to engage in smoking and purchase cigarettes.(5) The discontinuation of POP advertising has led to a marked reduction in this effect, with a 30% reduction in spontaneous tobacco purchases following a tobacco display ban in Western Australia,(6) suggesting there are benefits from limiting pack advertising on smoking behaviour.

With the advent of restrictions on tobacco advertising in many developed countries, cigarette packaging has become a major avenue for tobacco companies to promote their product.(1,7) There are many cigarette brands and distinguishing between them can be difficult for buyers. Cigarette packaging consequently “assists consumers to select among other relatively homogenous products,”(7) and influences the decision-making of the consumer. Corporate branding is a well-established marketing tool for generating customer loyalty and this is especially true for tobacco; “cigarette brands enjoy the highest brand loyalty of all consumer products, with less than 10% changing brands annually”.(7)

In 2008, New Zealand introduced pictorial warnings on tobacco packages. These warnings cover 90% of the back and 30% of the front of packets.(8) Addition of these warnings was associated with an increase in the recognition of the phone number of a smoking cessation programme by smokers (Quitline) from 37% to 61%, suggesting the change in packaging facilitates smokers to become smoke free.(9) This increase is especially important as it occurred across all age groups, ethnicities, genders, and deprivation levels.(9) Furthermore, there was an increase (from 7.5% to 24.6%) in new callers to Quitline who obtained the number from cigarette packaging and a decrease in callers who did so from TV advertising (from 34.9% to 27.1%).(10) Following packaging changes, the number of monthly registrations to Quitline increased from 1517 to 1729 and this did not appear to be attributable to any other anti-smoking campaigns.(8)

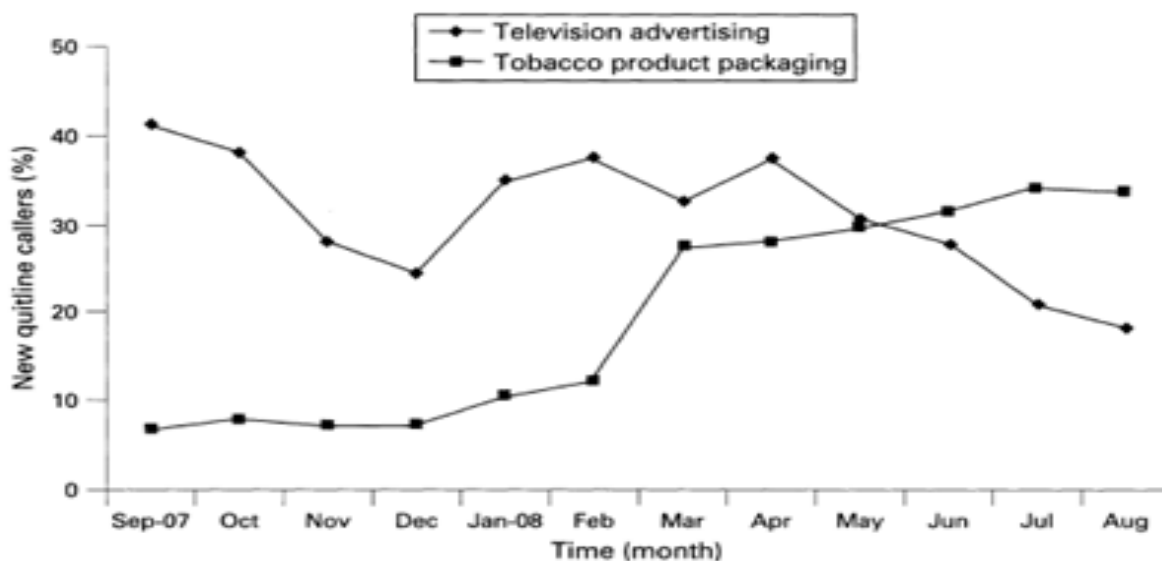


Figure 1 Percentage of new Quitline callers who obtained the Quitline number from television advertising and tobacco product packaging. September 2007 – August 2008.(8)

This upsurge in Quitline calls indicates the efficacy of pictorial health warnings on smokers' behaviour and adds to the case for increasing their presence. In addition to domestic evidence, a 2012 Australian study found a 78% increase in calls to Quitline after the conversion from packs with branding and pictorial health warnings to plain packaging (with larger pictorial warnings).(11)

Due to the success of previous interventions, it has been hypothesised that plain, generic packaging will reduce the market influence of tobacco companies, thereby leading to a reduction in smoking.(7,12) This is aligned with the principles of the Ottawa Charter, as public policies that reduce the influence of tobacco advertising create a supportive environment for smokers to quit, and ex-smokers to stay smoke free. The shift to plain packaging may help consumers make healthier choices.(12,13)

Unsurprisingly, prospective restrictions on advertising spurred an aggressive response from tobacco companies, and relevant legislation has been met with resistance. It has been argued that restrictive policies create a "slippery slope" leading to other products being targeted.(14) While such predictions have been discredited, this argument has continued to be used to resist further marketing restrictions.(14) Lobbying and litigation by the tobacco industry, although opposed, delayed new health warnings for eight years in Australia.(14) In New Zealand there is documentation that suggests the tobacco industry delayed health-warning implementation and successfully quashed plain packaging proposals in the 1990s.(15)

Our study aimed to explore cigarette pack display in New Zealand, while making comparisons with a 2012-2013 Australian study by Wakefield et al.(1) This latter study explored both the frequency and manner of display of cigarette packs in two Australian cities.(1) The authors argue that tobacco pack presentation on tables (e.g. at cafés or bars) is a form of indirect tobacco advertising targeting other customers and the general public.(1) They found that approximately 8% of patrons were actively smoking at the point of observation, and that 11% of patrons displayed a pack, with most packs placed face up. The study was repeated following the introduction of plain packaging in Australia.(16) The proportion of patrons actively smoking reduced by 23%, and the proportion of packs displayed decreased by 15%.(16) The proportion of packs orientated face-up also declined (from 85.4% to 73.6%).(16) Face-up orientation displays the cigarette brand as well as the smaller, less obvious version of the health warning (currently in New Zealand). This predominant orientation allows for repeated exposure to corporate brand messaging, while concealing the larger pictorial health image on the back.(1)

Given this background, the primary aim of our study was to:

1. Obtain baseline data on cigarette pack display and orientation pre-plain packaging to inform a future such study following the introduction of plain packaging legislation in New Zealand

Secondary aims were as follows:

1. To compare New Zealand data with the Wakefield et al Australian study (2013)
2. Investigate effects of the presence of children, including active smoking rates and pack display.

Methods

Literature review method

We conducted a brief review of literature on the impact of tobacco advertising on smoking behaviours. Initially we did a search using Google Scholar, PubMed and the Otago University Library Summon tool with the search words ‘tobacco’ and ‘advertising’. The search was then widened to include ‘smoking statistics in New Zealand’, ‘pictorial warnings’, ‘smoking behaviour’ and ‘quitline’. Most articles considered for final, detailed examination were on studies carried out in New Zealand and Australia as they were most relevant to our study population.

Observational study method

We selected three data collection routes within the Wellington central business district (CBD). This selection was based on our pilot observations and local knowledge that they contained a high number of eligible and accessible venues with both outdoor seating and relatively high levels of patronage. These routes were based around Cuba Street, Courtenay Place and the Wellington waterfront. Maps of these routes are attached in Appendices 2, 4 and 6.

Eligible venues within the three routes included cafés, restaurants, bars and pubs with outdoor tables visible from the footpath. Venues were excluded if there were no outdoor tables or if patrons were unlikely to remain at the tables for an extended period of time (10 minutes or more), such as fast food outlets and ice cream shops (as per the study by Wakefield et al). The Cuba Street route consisted of 21 venues, the Courtenay Place route 21 venues and the Waterfront route 12 venues.

The data collection team was comprised of 17 fourth year medical students of the University of Otago (Wellington), who were each assigned one of the three routes. Each route had a standard start point and observers were instructed to view every venue allocated on that route. Initially, the route observations were repeated every hour between 5-8pm on weekdays and 12-8pm on weekends, as prior to data collection, these times were observed to be those with the greatest number of patrons. After the initial two days of data collection, observations were repeated every 30 minutes as the team found observations took less than 30 minutes to complete. If the venue was closed at the time of data collection it was recorded as “missing” for that wave of data collection and not revisited for that day.

Data collection began early March 2014 (early autumn) and occurred over a two-week period. Days with very poor weather were avoided (n=1 day vs 9 days of conducted field work), as patronage would have been atypical.

Prior to beginning data collection, we carried out an initial pilot test to finalise the routes and test the functionality of our standard data collection form. We also conducted a study of inter-rater reliability using two non-communicating observers at each venue. The pair observed each of the three routes three times and a total of 195 packs were assessed in this inter-rater reliability study. The statistical test we used to assess this was Pearson’s coefficient.

On each route, fieldworkers walked along the footpath and collected data using a standardised, printed-paper form with the named venues that were specific for each route. They discreetly noted: (i) the number of seated patrons (adults and children recorded separately), (ii) total number of children who appeared 12 years or younger present at the venue and also seated within 10 metres of the venues’ outdoor tables, (iii) the number of active smokers, i.e. the number of people smoking or holding/rolling/lighting a cigarette, (iv) the number of total tobacco packages (packages of both manufactured cigarettes and roll-your-own tobacco) visible on the table, and (v) the orientation of the tobacco packages (v.i) face-up, showing the tobacco brand (and small health warning), (v.ii) face-down, showing the large pictorial health warning on the back of the packaging, (v.iii) standing

on their side, (v.iv) standing on their top, (v.v) standing on their bottom, (v.vi) in a case or tin, other than the original packaging, (v.vii) completely covered (e.g., by a wallet or phone, or in a pocket or bag), so that the data collector was unable to ascertain the orientation, and (v.viii) with an unknown orientation (e.g. if the data collector was unable to get close enough to discern the orientation). All data collection was done as discretely as possible to avoid influencing normal patron behaviour at the observed venues. Data collectors also recorded the temperature (in degrees Celsius) and wind speed (in kilometres per hour) for Wellington City at the start time of their route from <http://www.metservice.co.nz>.

Data processing and analysis

Data was entered into Excel and analysed using Excel and the online “OpenEpi” statistical program.

Ethics approval

Ethical approval for this study was obtained via the standard University of Otago ethics approval process.

Results

A total of 2971 venue observations were taken at the 55 venues in this study; 21 in Cuba Street, 12 in the Waterfront area, and 22 in Courtenay Place (21 initially but 1 added early in the study) (Table 1). Venues were observed on average 54 times each. In 1444 (48.6%) of the observations, venues were either closed or had no patrons and no packs in their outdoor areas. There were therefore 1527 venue observations yielding data on packs and smoking behaviour.

In the inter-rater reliability study 195 packs were observed. Pearson’s correlation coefficients were high, indicating good reliability. That is for numbers of: smokers (0.94), packs (0.97), packs face-up (0.96), with the mean for all 10 measures (0.88), and the lowest coefficient being for concealed packs (0.67).

Over the study period 19,189 patrons were observed in the outdoor seating areas of the venues. Of these, 461 (2.5%) were child patrons (with another 180 children nearby within 10m). There were 1357 (7.1%) adult patrons who were observed smoking. The point prevalence of observed active smokers in the three study areas were 11.5% (Cuba Street), 3.2% (Waterfront), and 13.0% (Courtenay Place).

A total of 1707 packs were observed displayed on tables giving a ratio of one pack per 11.2 patrons. Compared to the number of smokers, this equates to a ratio of 1.26 packs per smoker, meaning that at least 350 packs (20.5%) belonged to smokers who were not actively smoking but who still had their pack on display at the time of the observation.

Table 1 shows the number of venues and observations made in each route and totals of packs, smokers, adult patrons, child patrons, and total potentially exposed children (including patrons and those seated nearby (ie, within 10 metres of a venue table). The majority of child patrons were observed on the waterfront route in spite of it having the fewest number of venues (out of the three routes) and the fewest number of total venue observations over the study period. We also observed the fewest number of packs and smokers on this route.

Table 1: Descriptive statistics for venues and observations

	Courtney Place	Cuba Street	Waterfront	Total
Number of Venues	22	21	12	55
Observations per Venue	47	59	58	
Total Observations per Route	1,024	1,239	708	2,971
Number of Observations				
Packs	636	597	474	1,707
Smokers	508	504	345	1,357
Adult Patrons	3,893	4,359	10,476	18,728
Child Patrons	26	38	397	461
Children Potentially Exposed	32	105	504	641

Notes: "Children potentially exposed" refers to both child patrons at the venue plus children who were seated nearby (<10m) the nearest tables at the venues.

Observations were on days without rain, with the average day time temperature on observation days in Wellington City being 17.8 degrees C (range: 13 – 21), and wind speed was 18.5 kmph (range: 2 – 46).

Table 2 shows statistically significant differences in both smokers and packs displayed per patron between this study and the similar study by Wakefield et al completed in Victoria and South Australia.(1) It also shows that the rate of smoking and pack display per patron of each route within our study was statistically different; the Waterfront had the lowest observed rates, then Cuba Street, with the highest at Courtenay Place. The table also shows a comparison between different days of the week from 5pm onwards (not enough data was collected before 5pm on weekdays to make for worthwhile comparisons). Smoking rates were statistically lower in the weekend and higher in late weekdays when compared to early weekdays. Rates of pack display per patron were lower on the weekend but no difference was observed between early and late weekdays.

Table 2: Occurrence of smoking and tobacco packaging display at outdoor venues in the Wellington CBD (n=xx venues, March 2014)

	People smoking (out of all patrons)		Packs on tables (out of all patrons)	
	N	% (95%CI)	N	% (95%CI)
Overall				
Wellington Study	1,357/19,189	7.07 (6.72-7.44)	1,707/19,189	8.90 (8.50-9.31)
Australian study (The Silent Salesman, Wakefield et al)	1,576/18,954	8.31 (7.93-8.72)	2,153/18,954	11.36 (10.91-11.82)
By Venue				
Cuba St	504/4,397	11.46 (10.55-12.44)	597/4,397	13.58 (12.60-14.63)
Waterfront	345/10,873	3.17 (2.86-3.52)	474/10,873	4.36 (3.99-4.76)
Courtenay Place	508/3,919	12.96 (11.95-14.05)	636/3,919	16.23 (15.11-17.42)
By Day of Week (after 5pm)				
Early Weekday Mon - Wed	414/4,485	9.23 (8.42-10.22)	588/4,485	13.11 (12.15-14.13)
Late Weekday Thurs - Fri	264/2,390	11.05 (9.85-12.37)	324/2,390	13.56 (12.24-14.99)
Weekend	111/1,821	6.10 (5.09-7.29)	151/1,821	8.29 (7.11-9.65)

Table 3: Pack Orientation Rates - Total 1707 Packs

	Total (n)	% (95%CI)
Face Up (showing brand & small health warning)	1,366	80.02 (78.06-81.85)
Face Down (showing large health warning)	141	8.26 (7.05-9.66)
On Side	22	1.29 (0.85-1.98)
On Top (standing upside down)	6	0.35 (0.17-0.76)
On Bottom (standing upright)	3	0.18 (0.06-0.52)
Case/Tin	29	1.7 (1.19-2.43)
Concealed (e.g. under wallet or phone)	97	5.68 (4.68-6.88)
Unknown (observer could not determine orientation)	43	2.52(1.88-3.38)

Table 3 shows pack orientations rates. Of the 1707 packs observed 80.0% were oriented face-up (showing the brand and small pictorial health warning), 8.3% were face-down (showing the larger pictorial health warning on the back), 1.8% were upright or lying on their side, 1.7% of packs were in a case or tin and 5.7% were concealed so that the labels were not able to be seen but the observer could still see that pack was present. For the remaining 2.5% of packs, the observer could see a pack but could not determine the orientation of it.

The analyses in Table 4 show that rates of smoking and pack display per adult patron were both significantly higher when there were no “children potentially exposed” at/near the venue compared to when there was one or more “children potentially exposed” at/near the venue (2-tailed p-value<0.0001).

Table 4 :Univariate analysis comparing smoking rates and pack displays rates with 0 vs. 1+ children potentially exposed

Variable	Number of packs or smokers	Number of adults	%	Risk ratio (95% CI)	p Value
Packs at Venues					
No children potentially exposed (n=2729 venue observations)	1,464	12,535	11.7	2.98 (2.61-3.40)	P<0.0001
1+ children potentially exposed (n=242 venue observations)	243	6,193	3.9	1.00	–
Smokers at Venues					
No children potentially exposed (n=2729 venue observations)	1,159	12,535	9.3	2.89 (2.50-3.35)	P<0.0001
1+ children potentially exposed (n=242 venue observations)	198	6,193	3.2	1.00	–

Note: “Children potentially exposed” refers to both child patrons at the venue plus children who were seated nearby (<10m) the nearest tables at the venues.

Table 5 shows a comparison of rate of pack display per adult patron at venues with no child patrons vs. venues with one or more child patrons. Pack display per adult patron was significantly higher

(11.41% vs. 3.69%) with no child patrons at the venue and this correlation persisted for each route when a stratified comparison was made.

Table 5: Univariate analysis comparing pack display rates with 0 vs 1+ child patrons (stratified to venue area)

Variable	Number of packs or smokers	Number of adults	%	Risk ratio (95% CI)	p Value
Total					
Packs at venues with no child patrons (n=2778 venue observations)	1,503	13,172	11.41	3.09 (2.68-3.56)	P<0.0001
Packs at venues with 1+ child patrons (n=193 venue observations)	205	5,556	3.69	1.00	–
Cuba Street					
Packs at venues with no child patrons (n=1215 venue observations)	578	4,082	14.16	2.06 (1.33-3.21)	P=0.001
Packs at venues with 1+ child patrons (n=24 venue observations)	19	277	6.86	1.00	–
Waterfront					
Packs at venues with no child patrons (n=556 venue observations)	304	5,367	5.66	1.7 (1.42-2.05)	P<0.0001
Packs at venues with 1+ child patrons (n=152 venue observations)	170	5,109	3.33	1.00	–
Courtney Place					
Packs at venues with no child patrons (n=1007 venue observations)	620	3,723	16.65	1.77 (1.10-2.84)	P=0.013
Packs at venues with 1+ child patrons (n=17 venue observations)	16	170	9.41	1.00	–

Discussion

Main Findings and Interpretation

In this observational study, baseline statistics of pack orientation, display and smoking were found to be comparable to a similar study conducted before the introduction of plain packaging in Australia.(1) In a further study in Australia, Zacher et al found that plain packaging policy resulted in a reduction in both pack display (per patron) and active smoking,(16) suggesting that it is plausible that New Zealand may experience similar benefits if plain packaging were implemented here.

The overall rate of pack display at eligible venues was 8.9% (one pack per 11.24 patrons). The study by Wakefield et al observed a marginally greater pack display rate of 11.4% (one pack per 8.8 patrons).(1) We found the majority of packs were displayed oriented face-up (80%) and 5.7% were concealed. This finding was similar to the pre-plain packaging results from the study by Wakefield et al (85% ‘face-up’ and 4.4% concealed).(1) The ‘face-up’ orientation conceals the larger pictorial health warnings on the back of the pack and maximises the ‘passive marketing’ associated with the tobacco brand on the front. Smokers have been found to have a negative psychological response to pictorial images on packs,(17) and the results of this study (and those of Wakefield et al) support this as a potential cause for the prevalence of ‘face-up’ pack orientation. However, other factors are likely to play a role such as the benefits of the ‘face-up’ orientation for ease of opening the pack to readily access cigarettes.

After the implementation of plain packaging in Australia, the orientation of observed packs changed. ‘Face-up’ display decreased from 85.4% to 73.6% with the plain packs, and the percentage of concealed packs almost doubled (from 4.4% to 9.5%).(16) These results suggest the

introduction of plain packaging and the larger pictorial images on the front of packs may have encouraged patrons to actively hide these images by concealing their packs. This results in reduced passive tobacco marketing that is associated with pack display and may reduce tobacco related harm, compounding the direct effects of plain packaging on consumer decisions.

Observed rates of active smoking outside venues in this study were slightly lower than those found in the study by Wakefield et al (7.1% and 8.3% respectively).(1) The similar (but still statistically significantly different) rates could reflect similarities in study design between this study and the study by Wakefield et al, and similar national smoking prevalence rates. New Zealand adults have a marginally lower regular daily smoking prevalence than Australia (15.1% and 16.3% respectively).(18,19)

In both studies, observed smoking rates were much lower than the national adult smoking prevalence rates. This is likely to be a result of the way the information was captured – point prevalence for observed smoking vs national census data for daily self-reported smoking. It may also be due in part to differences in demographics, and the timing and location of observations. Differences in the local, urban smoking culture within the study area compared to national statistics may be important – as in urban areas it has been reported that there are lower levels of smoking in some population groups in New Zealand (e.g. females).(20)

Another study by Chan et al conducted in the central business district of Wellington in 2013 reported a point prevalence for observed smoking of 15.8% (95% CI: 14.5% – 17.5%),(21) which is over double the rate we observed overall (7.1%, 95% CI: 6.7% - 7.4%). Possible reasons for this difference include study design, the specific nature and number of venues observed (14 vs 55 in 2013 and 2014 respectively), and the timing of observations (12-1pm and 7-8pm in 2013 vs 12-8pm in 2014). There may also have been small reductions in smoking prevalence in the New Zealand population since 2013. While our study consistently found lower observed smoking rates than the study by Chan et al, both studies found lower observed smoking rates at lunchtime when compared to the evening.

We found that observed smoking rates increased from 12pm to 8pm. This increase in smoking as the afternoon and evening progressed could be partly related to alcohol consumption in the evening. It has been shown that there is an association between the amount of alcohol consumed and increased smoking behaviour.(22) Higher rates of smoking were also observed in the weekend compared to earlier in the week in the study by Chan et al,(21) however, we found the opposite for both smoking and pack display. This could be due to the different data collection periods and locations between the two studies.

No significant difference was found between the prevalence of smoking with or without children present in the study by Chan et al.(21) However, our study observed significantly lower rates of active smoking and pack display per patron at venues where there were either children present (as either patrons and children within a 10m radius; or just as patrons). This relationship was found across all three routes (i.e. Cuba Street, Courtenay Place and Waterfront). This association might reflect the demographics of patrons in the different routes, decisions by parents not to take children to relatively smoky venues, and/or that the presence of children may be an important modulator of smoking behaviour when smokers see children nearby.

The lowest rates of smoking and pack display were observed for the venues on the Waterfront route. The low rates at the Waterfront may be due to this area being popular with families which include adults who might be more aware of the value of not smoking near children, however this is speculative and data was not collected on such aspects. The increased presence of children on the Waterfront route may have also contributed to lower rates. Conversely, the venues of Cuba Street

and Courtenay Place may be more oriented towards adult nightlife and have a different demographic of patrons who are more likely to smoke and display their packs.

Strengths and Weaknesses of the Study

To our knowledge, this study was the second in the world and the first in New Zealand to investigate cigarette pack display and orientation. A specific strength was also the high level of inter-observer reliability with data collection (as per the Pearson's correlation coefficient results). Our observational method was also a simple and effective way to collect data on tobacco packaging display and smoking behaviour. This method appeared to provide accurate and comprehensive measurement and avoided biases found with other methods including recall and social desirability bias.(23,24) Smoking and pack display rates were also observed from 12-8pm, allowing the identification of variations over this time period both within and between collection routes. The presence of children was recorded, both as patrons at the venue as well as non-patron children within a 10m radius. This information provided an indication of potential pack-related passive advertising and cigarette smoking exposure among children and also allowed us to investigate the effects of the presence of children on smoking behaviour.

This study reported pack display results per smoker, information that was not reported by the studies by Wakefield et al and Zacher et al.(1,16) This is a strength as pack display rates per smoker may be a better indicator of individual smokers' behaviour than pack display rates per patron which are susceptible to confounding by overall smoking rates. As they shed light on individual smoking behaviour, changes in pack display rates per smoker are of interest in the analysis of the effects of plain packaging (as are changes in active smoking and pack display rates per patron).

A limitation of this study was that we were not able to account for the socio-economic status (SES) of our sample areas as we only sampled three areas in the central business district of Wellington (and variations in SES by small area or by patron group were not obvious to us). The study by Wakefield et al accounted for SES by comparing variations across locations.(1) If our study was repeated on a larger scale, then more locations and cities could be included, which would allow socioeconomic data to be collected in accordance with the NZ Deprivation Index (a small area measure of deprivation).(25) In the future, it would also be valuable to sample from areas where there is a high population density of Māori and Pacific Island people, given higher rates of smoking within these groups (26) and the need to access any plain packaging laws in terms of impact on health inequalities.

During data collection there were isolated negative reactions from the public towards data collectors (obscene gestures and derogatory comments were reported on two occasions). This may have limited the accuracy of the data collected if it caused collectors to speed up their data collection in certain areas when these reactions occurred. The effect of this could be averted in future studies by the use of electronic data collection, which has been found to be less intrusive and more accurate compared to pen and paper.(27)

Implications for Research

The main implication of this study on future research is its potential role in providing robust baseline data for a follow-up study investigating the effects of the introduction of plain packaging legislation in New Zealand.

The presence of important tobacco-related health inequities means further expansion of this type of study in areas with high Māori and Pacific Island populations that recorded socio-economic data would be desirable.

This study found an association between the presence of children and lower rates of active smoking and pack display. Although this relationship was observed across all routes, it is possible that other factors (e.g. patron demographics) may have been the cause of this observed association and not necessarily changes by smokers when they see children around them. Further research is desirable to explore the nature of this association.

Anecdotally we have heard that some smokers are reticent about having their packs on display as if they do then it is more likely that people ask them for a cigarette. Therefore as prices of cigarettes increase (with ongoing tobacco tax rises in New Zealand), this might reduce pack display for this reason alone. Again, qualitative research could explore such issues.

Implications for Policy

Current government policy development has led to the introduction of the Smoke-free Environments (Tobacco Plain Packaging) Amendment Bill.(28) New Zealand is a signatory to the WHO Framework Convention on Tobacco Control,(29) and so is committed to reducing tobacco consumption in its population. Plain packaging would enforce regulations on various marketing dimensions including branding and pictorial warning size. There is a need for standardised packaging as current cigarette packaging is a powerful marketing tool.(30)

Plain packaging in Australia resulted in a 15% decline in personal pack display (per patron) at bars and cafés, and a 23% decline in active smoking.(16) It is possible that similar declines could be achieved in New Zealand with the implementation of plain packaging policy, potentially reducing exposure to tobacco branding and smoking in public, and reducing perceived smoking prevalence among the general population. This is important for young adults, as the overestimation of smoking prevalence by young people has been associated with increased odds of future smoking.(31)

A repeat of this study after the implementation of plain packaging legislation in New Zealand would allow a comparison of data to evaluate whether these improvements occurred. This may provide additional scientific evidence for the effectiveness of plain packaging as a public health measure.

In our view, plain packaging legislation is supported by a combination of increasing public and political support, a nationwide aim to achieve Smoke-free 2025,(32) obligations to the WHO Framework Convention and the results achieved with plain packaging in Australia.(16) This intervention "... takes away the last means of promoting tobacco as a desirable product." (33) Consequently, plain packaging could remove influences leading to the initiation of tobacco smoking (particularly by youth) and is expected to lead to a reduction in the prevalence of smoking and subsequently exposure to second hand smoke.

The observation of lower rates of active smoking and pack display in the presence of children is of interest to policy-makers in that this effect could be used strategically in policy and health promotion measures to maximise their effectiveness.

The lower rates of pack display and active smoking at the Waterfront area could also indicate that implementation of a local smoke-free policy at this venue may be more readily accepted by the general public, compared to similar restrictions imposed on Cuba Street and Courtenay Place. Such

results may be of interest to Wellington City Council (which has recently enacted a smoke-free parks policy).

Conclusions

This study aimed to collect and analyse baseline data on tobacco packaging display and smoking behaviours at outdoor areas of hospitality venues in the central business district of Wellington. We largely replicated the methods used in a similar study in Australia,(1,16) where plain packaging was recently implemented. Although there were statistically significant differences, we found similar baseline rates of active smoking, pack display per patron and similar patterns of pack orientation. Though speculative at this stage, similarities between this study and those conducted in Australia suggest that plain packaging legislation may also result in reductions in active smoking and pack display rates in outdoor areas of hospitality venues in New Zealand. The observation of lower rates of active smoking and pack display in the presence of children is an interesting finding that could be further investigated and this effect could be used strategically in health policy and promotion. Ideally this study should be repeated after the introduction of plain packaging legislation in New Zealand. A follow-up study would provide empirical data on the effects of plain packaging on brand promotion and smoking behaviour and may contribute to scientific understanding for its effectiveness as a public health policy.

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References

1. Wakefield M, Zacher M, Bayly M, Brennan E, Dono J, Miller C, et al. The silent salesman: an observational study of personal tobacco pack display at outdoor cafe strips in Australia. *Tob Control*. 2013 [E-publication 20 February]
2. World Health Organization. WHO REPORT on the global TOBACCO epidemic, 2011 Warning about the dangers of tobacco. Geneva, Switzerland; 2011.
3. Tobias M, Turley M. Causes of death classified by risk and condition, New Zealand 1997. *Aust N Z J Public Health*. 2005;29:5–12.
4. Davis RM, Gilpin EA, Loken B, Viswanath K. The Role of the Media in Promoting and Reducing Tobacco Use. Health (Irvine Calif). 1998.
5. Carter OBJ, Mills BW, Donovan RJ. The effect of retail cigarette pack displays on unplanned purchases: results from immediate postpurchase interviews. *Tob Control* 2009;18:218–21.
6. Carter OBJ, Phan T, Mills BW. Impact of a point-of-sale tobacco display ban on smokers' spontaneous purchases: comparisons from postpurchase interviews before and after the ban in Western Australia. *Tob Control*. 1–6. Available from: <http://tobaccocontrol.bmj.com/content/early/2013/12/23/tobaccocontrol-2013-050991.abstract>
7. Wakefield M, Morley C, Horan JK, Cummings KM. The cigarette pack as image: new evidence from tobacco industry documents. *Tob Control* 2002 Suppl 1:I73–80.
8. Li J, Grigg M. New Zealand: new graphic warnings encourage registrations with the quitline. *Tob Control* 2009;18(1):72.

9. Wilson N, Weerasekera D, Hoek J, Li J, Edwards R. Increased smoker recognition of a national quitline number following introduction of improved pack warnings: ITC Project New Zealand. *Nicotine Tob Res* 2010 12 (Suppl 1):S72–S77.
10. Wilson N, Li J, Hoek J, Edwards R, Peace J. Long-term benefit of increasing the prominence of a quitline number on cigarette packaging: 3 years of Quitline call data. *N Z Med J*. 2010;123(1321):109–11.
11. Young JM, Stacey I, Dobbins TA, Dunlop S, Dessaix AL, Currow DC. Association between tobacco plain packaging and Quitline calls: a population-based, interrupted time-series analysis. *Med J Aust* 2014;200:29–32.
12. Wakefield M, Germain D, Durkin SJ. How does increasingly plainer cigarette packaging influence adult smokers' perceptions about brand image? An experimental study. *Tob Control* 2008 17:416–21.
13. World Health Organization. *Ottawa Charter for Health Promotion*. Ottawa, Canada; 1986.
14. Carter SM, Chapman SBT. “Avoid health warnings on all tobacco products for just as long as we can”: a history of Australian tobacco industry efforts to avoid, delay and dilute health warnings on cigarettes. *Tob Control* 2003;12:iii13–iii22.
15. Thomson G, Wilson N. *The Tobacco Industry in New Zealand : A Case Study of the Behaviour of Multinational Companies*. Public Health Monograph Series. Wellington, NZ; 2002.
16. Zacher M, Bayly M, Brennan E, Dono J, Miller C, Durkin S, et al. Personal tobacco pack display before and after the introduction of plain packaging with larger pictorial health warnings in Australia: an observational study of outdoor café strips. *Addiction* 2014;109:653–62.
17. Erceg-Hurn D, Steed L. Does Exposure to Cigarette Health Warnings Elicit Psychological Reactance in Smokers? *J Appl Soc Psychol* 2011;41:219–37.
18. Australian Bureau of Statistic. *Australian Health Survey: First Results, 2011-12 Tobacco Smoking* [Internet]. 2013 [cited 2014 Mar 26].
19. Statistics New Zealand. *Quitting and not starting - smoking in New Zealand decreases; 2013 Census* [Internet]. 2013 [cited 2014 Mar 26]. Available from: <http://www.stats.govt.nz/Census/2013-census/data-tables/totals-by-topic-mr2.aspx>
20. Ministry of Health. *Urban – Rural Health Comparisons: Key results of the 2002/03 New Zealand Health Survey*. Wellington, NZ: Ministry of Health; 2007.
21. Chan J, Burnett T, Baillie R, Blomfield S, Cameron-Christie P, Dickson J, et al. *Smoking in outdoor areas of bars and cafés: Large differences between midday and evening prevalences*. 2013.
22. Batel P, Pessione F, Maître C, Rueff B. Relationship between alcohol and tobacco dependencies among alcoholics who smoke. *Addiction* 1995;90(7):977–80.
23. Bailey KD. *Methods of Social Research*. 1st Edition. New York: The Free Press; 1978.
24. Patel V, Thomson G, Wilson N. Objective measurement of area differences in “private” smoking behaviour: observing smoking in vehicles. *Tob Control* 2013;22:130–5.
25. Salmond C, Crampton P, Atkinson J. *NZDep2006 Index of Deprivation*. Wellington; 2007.
26. Statistics New Zealand. *Tobacco Smoking* [Internet]. 2013 [cited 2014 Mar 27]. Available from: http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/nz-social-indicators/Home/Health/tobacco-smoking.aspx#info3
27. Thomson G, Russell M, Jenkin G, Patel V, Wilson N. Informing outdoor smokefree policy: methods for measuring the proportion of people smoking in outdoor public areas. *Health Place* 2013;20:19–24.

28. Smoke-free Environments (Tobacco Plain Packaging) Amendment Bill. Wellington, NZ; 2013.
29. World Health Organization. Guidelines for implementation of Article 13 of the WHO Framework Convention on Tobacco Control.
30. US Department of Health and Human Services. Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General. Rockville, MD; 2012.
31. Wang MP, Ho SY, Lo WS, Lam TH. Overestimation of peer smoking prevalence predicts smoking initiation among primary school students in Hong Kong. *J Adolesc Health* 2011;48:418–20.
32. Smokefree Aoteroa New Zealand. The pathway to achieving Smokefree Aoteroa New Zealand 2025. [Wellington, NZ]; 2010.
33. Turia T. First Reading of the Smoke-free Environments (Tobacco Plain Packaging) Amendment Bill [speech to parliament] [Internet]. First Reading of the Smoke-free Environments (Tobacco Plain Packaging) Amendment Bill. Available from: <http://www.beehive.govt.nz/speech/first-reading-smoke-free-environments-tobacco-plain-packaging-amendment-bill>

APPENDIX 1- Fieldwork Instructions

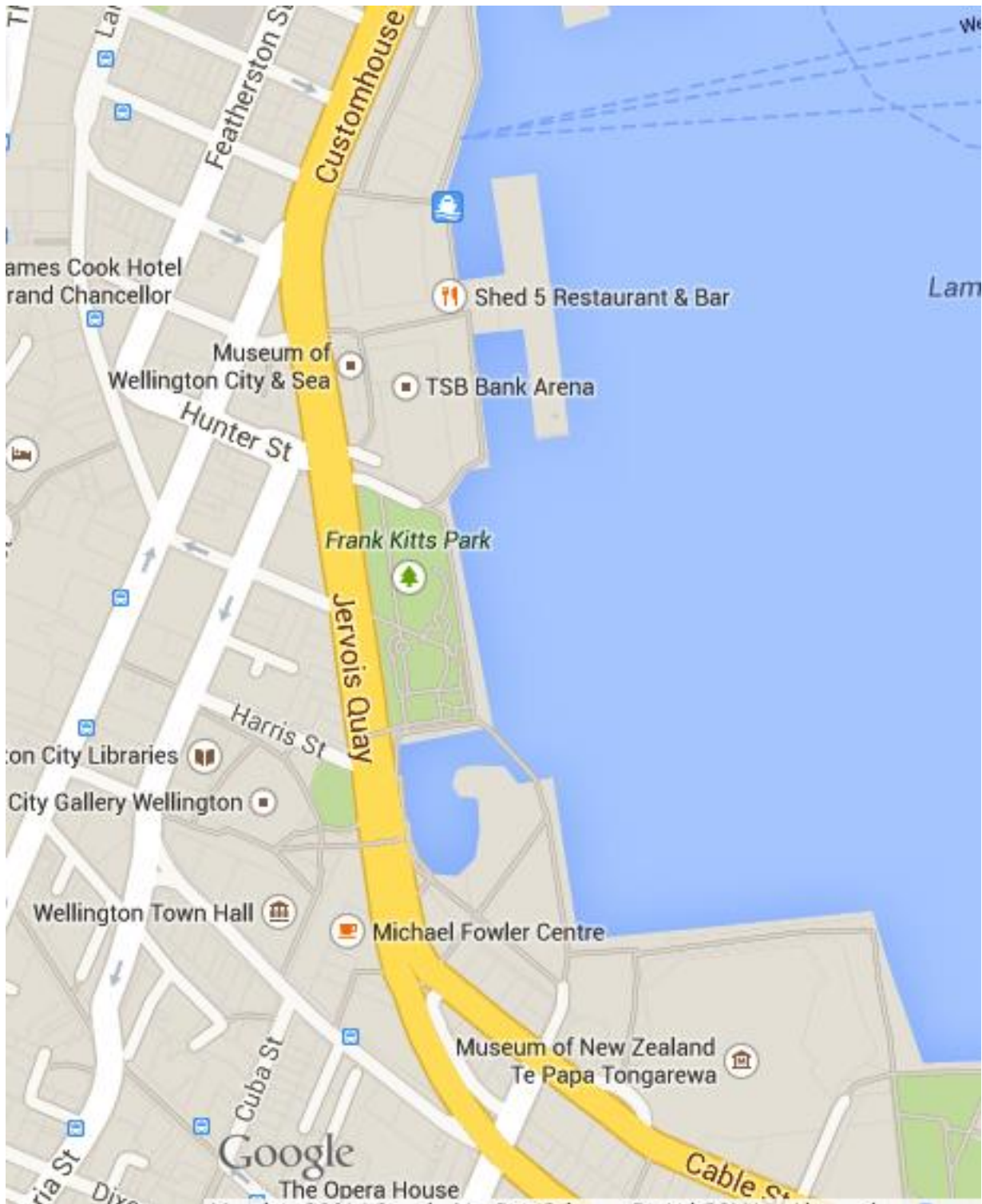
Instructions for Fieldworkers

Fieldworkers to record:

- Name of fieldworker
- The route, date and day of data collection, the time it was commenced and the time it was finished.
- The actual outside air temperature and wind speed at the start of data collection using metservice.
- **If part of the inter-reliability study**, note down that this is part of the study and who your partner was. Staple your forms together.

- The name of each venue on their route. The same venues must be visited each time. If you have a form with the route already on it, visit those venues.
- The time at each venue
- The number of patrons **seated or standing at a table** the venue (including children).
- The number of children (appear primary age, [up to 12]) at the venue or **seated** within 10 metres of any of the tables at the venue.
- The number of active smokers (including holding, rolling and lighting cigarettes) **seated or standing at a table** at the venue.
- The number of cigarette packages visible on the outdoor tables at the venue.
- The number of cigarette packages orientated in each of the following ways:
 - Face-up
 - Face-down
 - Standing on side, top or bottom record as (s=, t=, b=)
 - In a case or tin
 - Completely concealed e.g. by phone, wallet, pocket (the fieldworker is unable to ascertain orientation, but is able to detect its presence)
 - Unknown e.g. too far away to detect

APPENDIX 2- Waterfront Map



APPENDIX 3- Waterfront Data Collection Sheet

Name:

Route: **WATERFRONT**

Date and Day:

Time started:

Time finished:

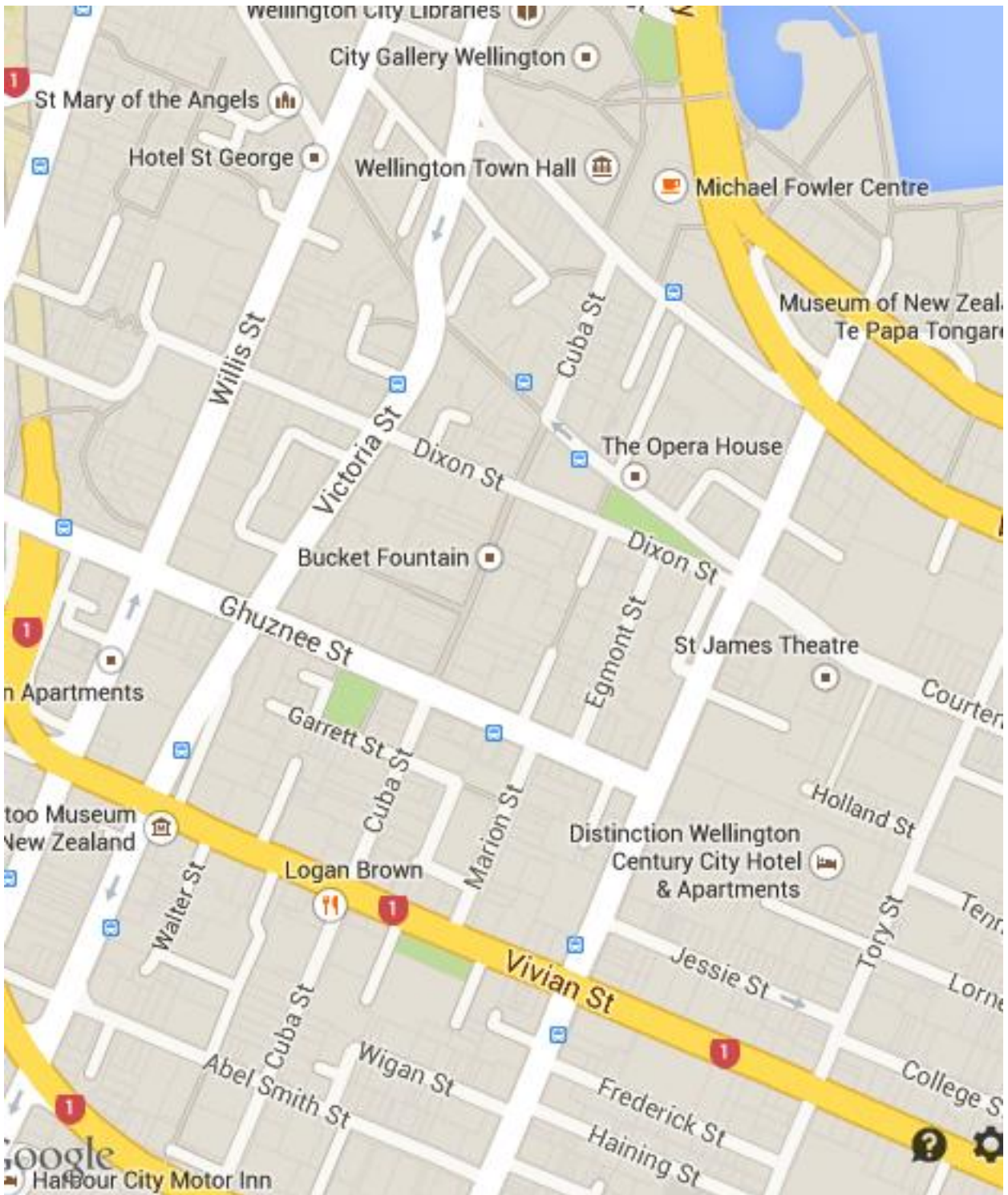
Outside temperature:

Wind speed:

Venue	Time	Patrons*	Children*	Smokers	Total Packs	Face-up	Face-down	Side	Top	Bottom	Cas/fin	Concealed	Unknown
Macs Brewery													
St Johns Heineken Hotel													
Te Raukura													
Tuatua													
Chicago Sports Cafe													
Bin 44													
Dockside													
Crab Shack													
Portofino													
Mojo													
One Red Dog													
Queens Wharf Ballroom													

* Note that in the final version, data were collected on adult patrons, child patrons, and also children who were not patrons but who were sitting within 10 metres of the nearest table of the venue.

APPENDIX 4- Cuba Street Map



APPENDIX 5- Cuba Street Data Collection Form

Name:

Route: **CUBA ST**

Date and Day:

Time started:

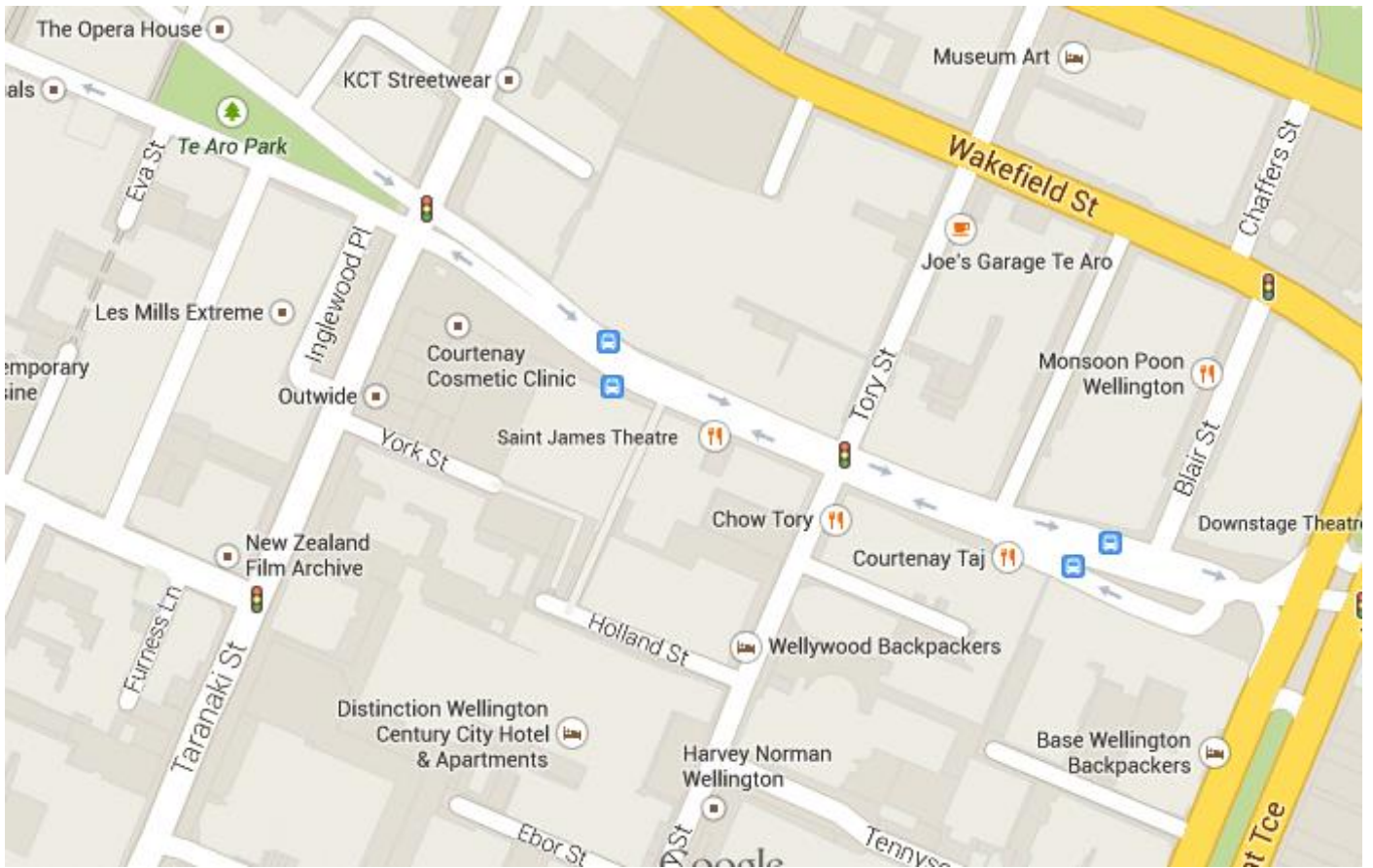
Time finished:

Outside temperature:

Wind speed:

Venue	Time	Patrons	Children	Smokers	Total Packs	Face-up	Face-down	Sidewalk	Top	Bottom	Casual/in	Concealed	Unknown
Heaven													
Phoenician cuisine													
Bru													
Wholly Bagels													
Hotel Bristol													
J. Murphy's													
Plum													
Felix													
Finc													
West Plaza Hotel													
The Lido													
Victoria St Café													
General Practitioner's													
Caliente													
Punch													
Mr Bun													
EspressoHolic													
Veni Vidi Vici													
Havana Coffee													
Rasa													
Fidel's													

APPENDIX 6- Courtenay Place Map



APPENDIX 7- Courtenay Place Data Collection Sheet

Name:

Route: **COURTNEY PLACE**

Date and Day:

Time started:

Time finished:

Outside temperature:

Wind speed:

Venue	Time	Patrons	Children	Smokers	Total Packs	Face-up	Face-down	Side	Top	Bottom	Cas e/tin	Concealed	Unknown
Memphis Bell													
Hope Bros													
The Jimmy Cake													
The Bangalore Polo Club													
KaPai													
Sweet Mother's													
Crafty Tavern													
The Tasting Room													
The Establishment													
Hummingbird													
Minibar													
Nicolini's													
Kitty O'Shea's													
El Horno													
Mishmosh													
Malthouse													
Public													
Vinyl													
The Residence													
Electric Avenue													
Molly Malone's													