

# **Now we see them, now we don't: Tobacco pack display in New Zealand after the introduction of standardised packaging**

## **Fourth Year Medical Student Project by Group A2**

Kirsty Sutherland, Johanna Nee-Nee, Rebecca Holland, Miriam Wilson, Samuel Ackland, Claudia Bocock, Abbey Cartmell, Jack Earp, Christina Grove, Charlotte Hewson, Will Jefferies, Lucy Keefe, Jamie Lockyer, Saloni Patel, Miguel Quintans, Michael Robbie, Lauren Teape, Jess Yang

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## **Abstract**

### Introduction

In March 2018, Government started a transition to a standardised packaging policy, to help reduce the prevalence of smoking and the heavy burden it has on health and health inequalities in New Zealand. The aims of our study were: (i) to contribute to the evaluation of the impact of standardised tobacco packaging in NZ by repeating a previous published study on smoking and tobacco packaging display at outdoor areas of Wellington hospitality venues; (ii) contextualising this intervention for Māori health and reducing health inequalities; (iii) assessing the prevalence of vaping at these same venues and (iv) assessing the prevalence of smoking and vaping while walking at selected locations.

### Methods

The methods followed a very similar study conducted in 2014 for largely the same venues. The field work for this study was conducted from 16 May to 27 May 2018. Observations of smokers, vapers and tobacco packs were made at 56 hospitality venues in central Wellington, along three main boulevards; Cuba Street, Courtenay Place and the Waterfront. Observation data were systematically collected and recorded on a standardised form.

### Results

A total of 8191 patrons, 1113 active smokers, 114 active vapers and 889 visible packs were observed during 2422 venue observations. The percentage of visible packs per active smoker was 80% in 2018, compared to 126% in 2014 (risk ratio (RR) = 0.64, 95%CI: 0.60 to 0.67,  $p < 0.0001$ ). New packs were observed ( $n=475$ ) as well as old packs ( $n=47$ ) as the study was carried out during the introductory phase required by the law. The new packs in 2018 were less likely (0.77 times) to be face up, compared to visible packs in 2014 (95% CI: 0.72 to 0.83,  $p < 0.0001$ ). A greater percentage of visible packs were recorded as of 'unknown type/orientation' in 2018 (20.6% compared to 2.5%). The RR for pack visibility per adult patron without children present, compared to with children present, was 2.77 (compared to 2.98 in 2014). The RR for active smoking per adult patron without children present, compared to with children present, was 2.68 (compared to 2.89 in 2014). Active vapers were 6.12 times more likely to be observed at venues without children present as patrons, compared to venues with children present as patrons (95%CI: 1.9 to 19.2). A ratio of 10 active smokers to 1 active vaper was observed at the venues. During static observation of pedestrians at three set locations in central Wellington, a ratio of 2.92 active smokers to 1 active vaper was seen.

### Conclusions

As these data were collected during the transition period from non-standardised packaging to standardised packaging, they provide an early insight into the likely effectiveness of the new style of pack. The reduction in visible packs per active smoker, compared to in 2014, suggests that smokers find the new packs less desirable to have on the table and this is therefore probably an effective intervention. A smaller proportion of visible packs are face up, suggesting branding is less visible compared to in 2014. Further studies could be carried out at one year and two years post the introduction of standardised packaging, to evaluate the ongoing effectiveness of the standardised packaging and any possible desensitisation to the warnings. As this study is the first to observe the prevalence of vaping compared to smoking, further studies are required to assess any trend in visible vaping over time.

## Introduction

### International developments: Tobacco, its promotion and marketing restrictions

Tobacco use is one of the largest preventable causes of chronic disease and premature death globally, and a priority for public health interventions. (1) Tobacco marketing continues to foster smoking uptake among young people, and there is strong evidence it increases consumption of tobacco products, by promoting experimentation among non-smokers and reinforcing regular smoking, even among those intending to quit. (2,3) In order to address this issue, the New Zealand (NZ) and other governments have introduced policy measures to restrain tobacco marketing activities, including restrictions on advertising and promotion, and purchase age restrictions. However, tobacco marketing has continued to persist through the brand imagery shown on tobacco packages. (4)

Brand imagery on tobacco product packaging creates alluring connotations that increase the appeal of tobacco brands to youth and young adults, and reduce the effectiveness of health warnings.(5) In response to this evidence, several countries such as Australia, UK, Ireland, France, Norway, and Hungary have introduced standardised tobacco packaging (often referred to as “plain packaging”). Standardised packaging has been proven to be successful in reducing smoking prevalence and is endorsed by the World Health Organization (WHO) as one of the most effective tools in smoking prevention. (6) This policy limits residual tobacco marketing, reduces the appeal of tobacco products while increasing the salience and impact of health warnings, and reduces misperceptions about the harms caused by tobacco use. (5,6)

### The New Zealand situation

Over the last 30 years, the NZ Government has implemented varied measures that have steadily reduced smoking rates. However, tobacco smoking continues to place a heavy burden on the health of our population, with around 13 New Zealanders dying every day from illnesses caused by smoking. (6)

Among Māori, tobacco is the leading cause of mortality and driver of health inequality, with Māori having twice the smoking prevalence of the general population. (7) Smoking also causes social and economic disadvantage as whanau (family) are burdened by costs of having family members who smoke. Therefore, reducing ethnic disparities in tobacco consumption is a priority and there is a need to evaluate the likely impact of standardised packaging on Māori, specifically. There appears to be strong Māori support for smoke-free policies and a desire by Māori to take control of reducing the burden of the tobacco epidemic. (8) Support for standardised packaging legislation has been reported as stronger among Māori compared to non-Māori. (9) Following the initial 2008 introduction of pictorial health warnings (PHW), Māori reported stronger responses than NZ Europeans. For example, Māori were more likely to have noticed and avoided the images, thought about the associated health risks and forgone a cigarette. (10) These responses had increased compared to a pre-PHW survey, suggesting PHWs are more effective for Māori smokers compared to text-only warnings. (10) Therefore standardised packaging may be more effective than other tobacco control interventions in reducing smoking among Māori compared to NZ Europeans.

The concepts of justice and fairness are ethical drivers prioritising public health interventions which particularly impact to improve the health of disadvantaged populations and assist in progressing the goal of health equity. Quitline services, amalgamated with mass media campaigns, are an example of a just intervention which provide improved health outcomes for disadvantaged populations such as Māori in New Zealand. (11)

To further reduce the prevalence of smoking, the NZ Government has set a long-term goal of reducing smoking and availability of tobacco products to minimal levels by 2025 and has passed standardised packaging legislation for tobacco products in 2016. (5) The specific policy objective of standardised packaging of tobacco products in NZ was to prevent tobacco promotion and advertising from occurring on tobacco products and tobacco product packaging. (5) These policy objectives aim to discourage people from taking up smoking, reducing the population exposure to smoking and encouraging people to give up smoking. (5)

The law provides a transition period from 14 March to 6 June 2018, after which time no tobacco may be sold except in standardised packs. The standardised packaging regulations prohibited the use of tobacco company brand imagery, requiring the packets to have large pictorial images and prominent health warning messages which take up

75% on the front and back of all tobacco packaging. These regulations have standardised all design elements, only permitting the brand name and manufacturer information to appear under the designated colours and type fonts. (12)

The approach to standardised packaging used by NZ shares similar rules for standardised packaging as those used by Australia, applying consistent regulatory controls on the packaging of all types of tobacco products, not just cigarettes. This includes restrictions on the size and shape of the packaging and the materials used. (13) While branding on tobacco packaging is not the only factor tempting young people to try smoking or triggering relapse among people trying to quit, there is a substantial body of research to suggest it is an important factor. (6)

### **Does standardised tobacco packaging work?**

Standardised packaging has been shown to be effective amongst lower socioeconomic groups and indigenous populations. One Australian study found welfare aid recipients compared to higher SES participants were less likely to positively rate appeal, expected taste and perceptions of the pack when shown standardised packs compared to branded packaging. (14) Smokers were also 2.2 times more likely to say they would purchase a branded pack, compared to a standardised pack, when shown images of both. (14) Another study amongst indigenous Australians found that after standardised packaging was introduced, 65% of all smokers said they often or very often noticed pack warning labels over a one month period, compared to 45% of all smokers who previously reported often noticing any other form of smoke-free tobacco advertising or information over 6 months. (15) Smokers were also 1.5 times more likely to say that the new PHWs had led them to forego at least one cigarette per day and want to quit, when compared to the older packaging. (15) These findings may have implications for the likely effectiveness of Te Reo (Māori language) text on standardised packaging.

Standardised packaging is likely to result in the improved population outcomes by reducing smoking uptake in adolescents, (16) and increasing quit related behaviours in adults.(17), Other ethical considerations include the rights of children to not be exposed to harmful and misleading marketing via cigarette packets,(18) and the normalising of dangerous behaviours. The larger and more prominent warning labels on standardised packs increase consumers ability to know if a product has risks associated with its use, a well-established ethical and legal principle.(19)

### **Growing use of e-cigarettes in New Zealand**

The growing use of e-cigarettes (vaping) in NZ is challenging some conventional narratives about nicotine and tobacco. While vaping may potentially assist smoking cessation, there are concerns that vaping is not without health risks and may in fact lead to the renormalisation of smoking. (20,21) A meta-analysis found the odds of smoking cessation were 28% lower in individuals who used e-cigarettes when compared to those who did not use e-cigarettes. Due to the unknown long-term effects, the study suggested e-cigarettes should not be recommended as a smoking cessation aid until there is greater evidence that they are beneficial in assisting cessation. (22) Furthermore, the long-term effects of vaping and the overall population-level effects remain unknown.

A Cochrane systematic review found evidence that electronic cigarettes were effective as a smoking cessation aid compared to a placebo, and there was no evidence that short-term use was associated with any health risk. However, only a few short-term trials have been performed, and the strength of available evidence is considered low. (21) Due to New Zealand's demographics and the inequities that exist in smoking prevalence, the international literature will likely not suffice to direct policies and practices related to the use of e-cigarettes. Vaping is seen as a beneficial alternative to smoking by some NZ smokers, with 34% of smokers who were attempting to quit reported as believing that vaping was efficacious in smoking cessation. (23) Despite the barriers to obtaining nicotine for vaping, approximately 1.5% of adults in NZ reported vaping. In October 2017 the Ministry of Health announced that their focus regarding smoking was on "harm reduction, with an aim to support smokers to switch to significantly less harmful products like e-cigarettes". (23) There has also been increasing interest to use e-cigarettes as a tool for smoking cessation among low socioeconomic smokers, Māori and Pacific smokers. (23)

### **Relevant prior research on the impact of standardised packs on pack display by smokers**

Prior to the implementation of standardised tobacco packaging in Australia in 2012, a study found that 11% of patrons in the outdoor settings of cafés and bars had a pack visibly displayed, usually in a face up orientation, revealing the branding. (24) This study was repeated once standardised packaging was introduced; this found a 15%

reduction in observed packs per patron. Furthermore, of these packs, there was a 12% reduction in the proportion of packs displayed face up; previously the most prominent pictorial health warnings were on the back of the packs. (25)

A NZ research project in 2014 by Martin *et al*, before the implementation of standardised packaging, found that 8.9% of café/bar patrons had a visible tobacco pack, and that 80% of these packs were orientated face up, with 8% face down. (26)

Our hypotheses for this study were that there would be: (i) a decrease in tobacco pack display compared to Martin *et al* study in 2014, due to the new policy implementation from March 2018; and (ii) a decrease in the prevalence of “face up” display of tobacco packs.

The aims of our study were:

1. To contribute to the evaluation of the impact of standardised tobacco packaging in New Zealand by repeating a previous published study on smoking and tobacco packaging display at outdoor areas of Wellington cafes
2. To contextualise this intervention in terms of advancing Māori health and reducing inequalities by considering the literature on standardised packaging and tobacco warnings on Māori and other indigenous peoples.
3. To use this opportunity to also document the prevalence of vaping at these same street venues
4. To use this opportunity to also document the prevalence of smoking and vaping while walking at selected locations.

## Methods

The methods for this study were closely based on those conducted by Martin *et al*. in 2014,(26) prior to the introduction of standardised packaging in New Zealand, in order to produce comparable results.

### Site and venue selection

Observations were made of patrons, packs, pouches and vaping devices at tables outside hospitality venues in central Wellington that allowed smoking, in the same street areas used for the previous Martin *et al* study conducted in 2014. Venues were cafés, bars and restaurants with outdoor seating, generally along three main boulevards: Cuba Street, Courtenay Place and the Waterfront. These areas were selected in 2014 as having concentrations of venues with high patronage and sufficient outdoor seating arrangements.

Since 2014, a number of the previous 55 venues had closed down and were no longer a café/bar/restaurant (n=15). Others no longer had outdoor seating visible from a public walkway (n=3), the outside areas had explicitly been sign-posted as smoke-free areas (n=3), or were not suitable for other reasons (n=2). These inappropriate venues were excluded from the study and substituted with another venue on the same circuit, which also met the inclusion criteria (Appendix 1). Two field workers walked the planned route to document changes to the venues. This resulted in 56 being included in the final circuit; 14 in Cuba St, 21 in Courtney Place and 21 in the Waterfront.

### Data collection methods

Due to the limited time available for the project, data collection was constrained to an 11-day period from 16 May to 27 May 2018 (late autumn in New Zealand). Data were collected by 17 medical students from the University of Otago, Wellington, between 3.30pm and 9pm on weekdays and 12pm and 9pm on weekends, given worker availability and weather conditions. Observers began a round of venue observations at 1.25 hour intervals, taking a pre-defined circuit which started in Cuba St and ended in Courtney Place (for map see: Appendix 2). Field workers were given the option to work alone or in pairs. It was recommended that they work in pairs after 6.15pm, during times predicted to have a higher volume of patrons, so that observers could cross-check their observations and minimise counting errors. We did not conduct a study of inter-observer reliability, as Martin *et al* had already established high inter-observer agreement for observations using this method (and as found for similar research in Australia by Brennan *et al*). (27)

Data were collected on smartphones by filling in a standardised, online form at each venue (Appendix 3). The form was created using ‘Google Forms’. Smartphones were used as they were discrete and less conspicuous than paper notes. Immediately after the venue observation, the data was submitted and automatically entered into an online spreadsheet, in order to minimise transcription errors. The program recorded the date and time of the submission

automatically, which was used as a checking tool in order to rectify errors in data entries. At each venue, field workers counted and recorded details regarding the patrons present in the outdoor seating areas visible from the public walkway.

These details included: date, time (options were given in half hour time brackets), number of adult patrons, number of child patrons (<12 years), number of 'active smokers', number of 'active vapers', number of old (not standardised) packs and pouches, and new (standardised) packs and pouches on tables in each orientation (face up, face down, sitting on the side/top/bottom, partially concealed), the number of packs of unknown type/orientation, the number of packs in a case/tin on tables, number of vaping devices on the tables, and the number of children within 10m of tables where there was smoking and who are not otherwise patrons. A form displaying the various packs, devices and orientation was distributed to field workers prior to data collection in order to aid accurate identification (Appendix 4). If venues were closed, data was not collected. Patrons who were assessed to be children (<12years) were those who appeared to be of primary school age, as discerned by the observer, as this was the method used by Martin et al.

### **Pilot test**

Two field workers trialled and determined the route of the circuit prior to data collection. One circuit initially took approximately 1.5 hours for a pair of field workers. The online form was revised two days into data collection, which reduced this time down to approximately 1 hour.

### **Static observation of walking smokers and vapers**

In this additional sub-study, we aimed to measure the relative proportions of smokers to vapers walking along the three main streets. During each circuit, field workers sat and observed walkers within a previously defined area for 10 minutes (Appendix 5). Workers were asked to record the location, time, number of active smokers and number of active vapers passing them within an approximate 5m radius. This was done on another online, standardised form (Appendix 6). This was a pilot study and data were collected sporadically throughout the data collection period for the main study.

### **Weather**

The weather conditions: temperature, wind speed and humidity, for Wellington Central were obtained from <http://www.metvuw.com/> and recorded every day at 5pm, approximately the midpoint of data-collection (Appendix 7).

### **Data processing and analysis**

Recorded observations were entered directly into an Excel spreadsheet using Google Forms. Data manipulation and analysis was performed using pivot tables in Excel. Confidence intervals and two-tailed p-values (using the Mantel-Haenszel chi square test) were calculated using Open Source Epidemiologic Statistics for Public Health online ([http://www.openepi.com/Menu/OE\\_Menu.htm](http://www.openepi.com/Menu/OE_Menu.htm)). All figures included were also produced in Excel.

### **Ethics approval**

Approval for this study (D18/121) was obtained on 16 April 2018 via standard University of Otago processes. The approval was subsequently amended on 17 May to allow for data collection to occur beyond daylight hours.

## Results

There was rain on five of the 10 observation days, compared to 0 days in 2014. The average daytime temperature was 14°C (range 10.5 to 16.9°C) compared to 18°C (range 13 to 21°C) in 2014. The average wind speed was 27kmph (range 5 to 45kmph), compared to 18kmph (range 2 to 46kmph) in 2014. See Figure 1.

### Observed population and venues

A total of 7977 adult patrons and 214 child patrons (8191 patrons in total) were observed between 16 May and 27 May 2018 in outdoor seated areas in 56 venues around central Wellington (Table 1). Children thus comprised 2.6% of all observed patrons, slightly lower than 3% of all observed patrons in the 2014 study. A total of 1113 (14%) of adult patrons were observed actively smoking, 7% (absolute value) higher than in 2014 (Table 2). Consistent with the findings of the 2014 study, the prevalence of active smoking was highest on Courtenay Place (18%), followed by Cuba Street (14%) and the Waterfront Area (9%). The number of patrons per venue decreased from 2014 to 2018 across all three locations, with the greatest decrease occurring in the Waterfront area.

Table 2 also gives the percentage of active smokers and visible packs per all patrons and the difference in percentage between the 2014 study and this study in 2018. A total of 889 packs were visible on tables, with the percentage per adult patron being 2% higher than in 2014 (11% in 2018 compared to 9% in 2014). However, the percentage of packs visible on tables per active smoker was significantly lower in 2018 (80% in 2018 compared to 126% in 2014, risk ratio (RR) = 0.64, 95%CI: 0.60 to 0.67,  $p < 0.0001$ ). There were also 0.5 fewer visible packs per active smoker in 2018 compared to 2014.

As anticipated with the colder weather in this late autumn study (and more non-smoking patrons probably being inside), the percentage of active smokers per patron was found to be higher in 2018 (+6.5%) compared to 2014. As for 2014, the prevalence rates of active smoking and visible packs per patron differed significantly across the three areas, with the Waterfront prevalence being statistically significantly lower for both years, compared to Courtenay Place and Cuba Street. After 5pm, both the percentage of active smokers and the percentage of packs visible per patron were significantly higher in the weekdays and significantly lower in the weekends. This result was found in the 2014 study also.

### Tobacco pack display and positioning

Because this study was conducted shortly after the introduction of standardised packaging, there were both new and old non-standardised packets in circulation (the legal end date for the sale of old packets (6 June) being two weeks post the termination of the data collection period). A total of 475 new packs were observed compared to 47 old packs. When new packs in 2018 were compared to old packs in 2014 (Table 3.2), it was found that visible packs in 2018 were statistically significantly less likely to be face up compared to visible packs in 2014 (RR = 0.77, 95%CI: 0.72 to 0.83). A significantly greater proportion of packs observed were of unknown type or orientation (2.5% in 2014 compared to 20.6% in 2018,  $p < 0.0001$ , Table 3.1). There was no significant difference in face up/face down orientation between new and old packs still in circulation in this study (but numbers of the latter were low) (Table 3.3).

### Associations when children were present

In both 2014 and 2018, the levels of active smoking and visible packs were found to be significantly higher in venues where there were no children present as patrons or within 10 metres of the outdoor venue tables (Table 4). The risk ratio for pack visibility per adult patron without children present compared to with children present was 2.77 (similar to 2.98 in 2014). The risk ratio for active smoking per adult patron without children present, compared to with children present, was 2.68 (similar to 2.89 in 2014). As demonstrated in Table 5, a higher level of visible packs per adult patron in venues without child patrons, compared to venues with child patrons, was consistently found across all

three areas. Children comprised a greater proportion of total patrons in the Waterfront area (6.3%) compared to the other two areas (Cuba street 0.97% and Courtenay place 0.33%).

### **Vaping at outdoor tables**

A total of 114 active vapers were observed at the venues (1.4% of all adult patrons). Active vapers were 6.12 times more likely to be observed at venues without children present as patrons compared to venues with children present as patrons (95%CI: 1.9 – 19.2). The confidence interval for this risk ratio is wide, owing to the small number of active vapers at venues with children present. Observation of vaping was not performed in the 2014 study, so results cannot be compared between the two years.

### **Observation of smoking and vaping amongst pedestrians**

In this sub-study, active vapers and active smokers within a five metre radius of static observers were counted. The ratio of active smokers to active vapers was found to be 2.92 (Table 7). This ratio was higher on Courtenay Place compared to Cuba Street and the Waterfront. On average, six active vapers were observed per hour and 17 active smokers were observed per hour across the three locations. No consistent differences in early afternoon and evening times were found across the three locations, with the total rates of active vaping and smoking per hour in the afternoon and evening being quite similar: six active vapers per hour across both times and 18 active smokers per hour from 12 – 4pm compared to 17 active smokers per hour from 4 – 9pm.

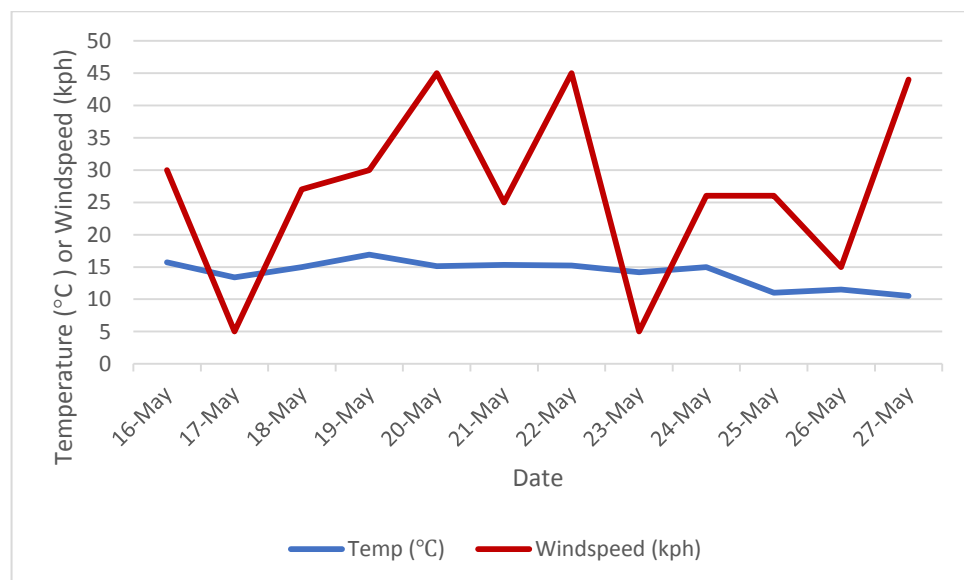
### **Caution in interpretation of results**

During the early stages of data collection, there was miscommunication to some of the data collecting team about the definition of 'vaping devices'. This was understood by some to include those devices being used by an active vaper, rather than those devices just sitting on a table. This would have overestimated the number of vaping devices rendering this data inaccurate. Therefore we have not used the data collected about total number of vaping devices in any analysis. Secondly, many of the data collecting team initially forgot to record 'children within 10m of an active smoker' which includes the area around the venue. This will almost certainly have caused this data to be underestimated. These data were only used in analysis in Table 4 due to the 2014 study also including this information in their published work. We did this so that the results will approach the true results as closely as possible and to increase comparability between the two studies. However, these data were excluded in Table 5 which also considers the effects of children and similar results were found.

**Table 1. Descriptive statistics for observed packs, smokers, patrons and non-patron children within 10m of venue for the three study areas in central Wellington City in May 2018, compared with March 2014**

Characteristic	Courtenay Place		Cuba Street		Study Areas Waterfront		Total		Difference in totals between studies (%) 2018 compared to 2014
	2014	2018	2014	2018	2014	2018	2014	2018	
Number of venues	22	21	21	19	12	16	55	56	+1.8
Average observations per venue	47	43	59	45	59	42	54	43	-20.4
Total venue observations	1024	901	1239	847	708	674	2971	2422	-18.5
Packs	636	381	597	321	474	187	1707	889	-47.9
Active smokers	508	435	504	416	345	262	1357	1113	-18.0
Adult patrons	3893	2384	4359	2970	10,476	2623	18,728	7977	-57.4
Child patrons	26	8	38	29	397	177	461	214	-53.6
Non-patron children (within 10m)	32	6	105	7	504	14	641	27	-95.8

**Figure 1. The average temperature (°C) and average wind speed (kmph) at 5pm each day during data collection from 16 May to 27 May 2018**





**Table 2. Active smoking and visible tobacco packs by area and day of the week in central Wellington City in May 2018, compared to March 2014 \***

Area/time	N		People smoking/all patrons % (95% CI)		P value (two-tailed)	Difference %	N		Visible tobacco packs/all patrons % (95% CI)		P value (two-tailed)	Difference %
	2014	2018	2014	2018	2018		2014	2018	2014	2018	2018	
<b>Total</b> 2018 n=8191 2014 n=19,189	1357	1113	7.1 (6.7 – 7.4)	13.6 (12.9 – 14.3)	<0.0001	+6.5	1707	889	8.9 (8.5 – 9.3)	10.9 (10.2 – 11.5)	<0.0001	+2.0
<b>By area:</b>												
Cuba Street 2018 n=2999 2014 n=4397	504	416	11.5 (10.6 – 12.4)	13.9 (12.7 – 15.1)	<0.0001	+2.4	597	321	13.6 (8.3 – 19.4)	10.7 (9.6 – 11.9)	<0.0001	-2.9
Waterfront 2018 n=2800 2014 n=10,873	345	262	3.2 (2.9 – 3.5)	9.4 (8.3 – 10.5)	<0.0001	+6.2	474	187	4.4 (2.8 – 6.0)	6.7 (5.8 – 7.6)	<0.0001	+2.3
Courtenay Place 2018 n=2392 2014 n=3919	508	435	13.0 (11.9 – 14.0)	18.2 (16.7 – 19.8)	<0.0001	+5.2	636	381	16.2 (12.0 – 20.7)	15.9 (14.5 – 17.4)	<0.0001	-0.3
<b>By day of week (after 5pm):*</b>												
Monday-Wed 2018 n=1437 2014 n=4485	414	295	9.2 (8.4 – 10.1)	20.5 (18.5 – 22.7)	<0.0001	+11.3	588	217	13.1 (10.2 – 16.2)	15.1 (13.3 – 17.0)	<0.0001	+2.0
Thursday-Friday 2018 n=2183 2014 n=2390	264	280	11.0 (9.8 – 12.3)	12.8 (11.5 – 14.3)	<0.0001	+1.8	324	228	13.6 (9.9 – 17.4)	10.4 (9.2 – 11.8)	<0.0001	-3.2
Saturday-Sunday 2018 n=1304 2014 n=1821	111	157	6.1 (5.1 – 7.3)	12.0 (10.4 – 13.9)	<0.0001	+5.9	151	124	8.3 (5.1 – 11.7)	9.5 (8.0 – 11.2)	<0.0001	+1.2

\*Observations in 2014 were collected between 5-8pm weekdays and 12-8pm on weekends, with the intention to collect data when patronage was highest. Observations in 2018 were collected between 3.30-9pm weekdays and 12-9pm on weekends, with the extended hours to compensate for the reduced sample size due to colder weather conditions.

Note: Calculations of active smokers and visible packs may be more relevant per adult patron, rather than per patron as children <12 very rarely smoke. However, to facilitate comparability with the Australian study, we used 'per total patrons' in this table (versus 'per adult patrons' in other Tables 4 and 5 and Figure 1).

Note: Confidence intervals for the 2014 values for people smoking/all patrons % have been recalculated using the same methodology as used in this study to achieve comparable intervals.

**Table 3.1. Tobacco pack orientation on the outdoor tables of venues in central Wellington City in May 2018, compared to March 2014 and for all types of packs (new and old packs, roll-your-own pouches, and unknown type of pack) \***

Pack orientation	2014		2018		Risk ratio (95% CI)	P value
	n	% (95% CI)	n	% (95% CI)		
Face up (showing a large pictorial warning in 2018 and a small one in 2014)	1366	80.0 (78.1 – 81.9)	511	57.5 (54.2 – 60.7)	0.72 (0.63 – 0.80)	<0.0001
Face down	141	8.3 (7.0 – 9.6)	133	15.0 (12.7 – 17.4)	1.81 (1.45 – 2.26)	<0.0001
Standing on the side, top or bottom	31	1.8 (1.3 – 2.5)	9	1.0 (0.5 – 1.9)	0.56 (0.27 – 1.17)	0.1148
In a case or tin	29	1.7 (1.2 – 2.4)	10	1.1 (0.6 – 2.0)	0.66 (0.32 – 1.35)	0.2548
Partly concealed (e.g. with wallet, phone, but ignoring lighters)	97	5.7 (4.7 – 6.9)	43	4.8 (3.6 – 6.4)	0.85 (0.60 – 1.21)	0.3655
Unknown type/orientation*	43	2.5 (1.9 – 3.3)	183	20.6 (18.0 – 23.3)	8.17 (5.92 – 11.28)	<0.0001
<b>Total</b>	<b>1707</b>	<b>100%</b>	<b>889</b>	<b>100%</b>		

\*The total for “unknown type/orientation” includes both packs where only the orientation is unknown, and also packs where both the type (new or old) and orientation are unknown.

Note: Confidence intervals for the 2014 values for people smoking/all patrons % have been recalculated using the same methodology as used in this study to achieve comparable intervals.

**Table 3.2. More specific comparison to that in Table 3.1 by considering just the box-shaped new standardised packs in 2018 compared to the 2014 study results (i.e excluding old-style packs but also excluding roll-your-own pouches from the 2018 sample)\***

Pack orientation	2014		2018		Risk ratio (95% CI)	P value
	n	% (95% CI)	n	% (95% CI)		
Face up	1366	83.5 (81.7 – 85.3)	297	64.6 (60.1 – 68.8)	0.77 (0.72 – 0.83)	<0.0001
Face down	141	8.6 (7.3 – 10.1)	85	18.5 (15.2 – 22.3)	2.1 (1.67 – 2.75)	<0.0001
Standing on the side, top or bottom	31	1.9 (1.3 – 2.6)	7	1.5 (0.7 – 3.2)	0.80 (0.36 – 1.81)	0.5952
Partly concealed (e.g. with wallet, phone, but ignoring lighters)	97	5.9 (4.9 – 7.2)	31	6.7 (4.8 – 9.4)	1.14 (0.77 – 1.68)	0.06877
<b>Total</b>	<b>1635</b>	<b>100%</b>	<b>460</b>	<b>100%</b>		

\*We removed the data on the roll-your-own pouches for 2018 from this analysis on the grounds that it was harder to ascertain orientation than box-shaped packs, whereas in 2014 this is likely to have been much easier (with only a relatively small pictorial health warning on the front at this time).

**Table 3.3. Tobacco pack orientation on the outdoor tables of venues in central Wellington City in May 2018, by type of pack**

Pack orientation	Old packs		New packs		Roll-your-own pouches		Unknown type		Total (n)
	n	% (95% CI)*	n	% (95% CI)*	n	% (95% CI)*	n	% (95% CI)*	
Face up	35	74.5 (60.6 – 85.4)	339	71.4 (67.2 – 75.3)	137	69.9 (63.2 – 76.0)			511
Face down	7	14.9 (6.8 – 27.3)	89	18.7 (15.4 – 22.4)	37	18.9 (13.9 – 24.8)			133
Standing on the side, top or bottom	1	2.1 (0.1 – 10.1)	8	1.7 (0.8 – 3.2)					9
Partly concealed (e.g. with wallet, phone, but ignoring lighters)	4	8.5 (2.8 – 19.3)	39	8.2 (6.0 – 10.9)					43
In a case or tin							10	5.8 (3.0 – 10.2)	10
Unknown orientation					22	11.2 (7.4 – 16.2)	161	94.2 (89.8 – 97.0)	183
<b>Total</b>	<b>47</b>	<b>100%</b>	<b>475</b>	<b>100%</b>	<b>196</b>	<b>100%</b>	<b>171</b>	<b>100%</b>	<b>889</b>

\*Where the denominator is the total number of that specific type of pack observed

**Table 4. Comparison of tobacco pack visibility and active smoking at venues with and without children (as patrons or within 10 meters of the venue tables) in central Wellington City in in May 2018 compared to March 2014\***

Number of venue observations (n)	Packs or active smokers (n)		Adult patrons (n)		Ratio* (%) (95% CI)		Risk ratio (RR)		P-value (two-tailed)	
	2014	2018	2014	2018	2014	2018	2014	2018	2014	2018
<b>Pack visibility</b>										
No children present (n = 2729 in 2014 n= 2355 in 2018)	1464	837	12,535	6805	11.7 (11.1 – 12.3)	12.3 (11.5 – 13.1)	2.98	2.77 (2.11 – 3.64)	<0.0001	<0.0001
1+ children present (n = 242 in 2014 n = 67 in 2018)	243	52	6193	1172	3.9 (3.5 – 4.4)	4.4 (3.4 – 5.8)	1.00 (ref)	1.00 (ref)		
<b>Active smoking</b>										
No children present (n = 2729 in 2014 n= 2355 in 2018)	1159	1046	12,535	6805	9.2 (8.7 – 9.8)	15.4 (14.5 – 16.3)	2.89	2.68 (2.12 – 3.42)	<0.0001	<0.0001
1+ children present (n = 242 in 2014 n = 67 in 2018)	198	67	6193	1172	3.2 (2.8 – 3.7)	5.7 (4.5 – 7.2)	1.00 (ref)	1.00 (ref)		

\*ratio of packs to adult patrons or ratio of people actively smoking to adult patrons

Note: Confidence intervals for the 2014 values for people smoking/all patrons % have been recalculated using the same methodology as used in this study to achieve comparable intervals.

**Table 5. Comparison of pack visibility prevalence rates at venues with and without child patrons (at cafés only) by study area and for the total observations in Wellington city in May 2018 compared to March 2014**

	Observations of venues (n)		Packs (n)		Adult patrons (n)		Ratio (%) (95% CI)		Risk ratio (RR)		P-value (two-tailed)	
	2014	2018	2014	2018	2014	2018	2014	2018	2014	2018	2014	2018
<b>Cuba street</b>												
No child patrons	1215	832	578	310	4082	2783	14.2 (13.1 – 15.26)	11.1 (10.0 – 12.4)	2.06	1.89 (1.1 – 3.4)	0.014	0.025
1+ child patrons	24	15	19	11	277	187	6.9 (4.3 – 10.3)	5.9 (3.2 – 10.3)	1.00 (ref)	1.00 (ref)		
<b>Waterfront</b>												
No child patrons	557	628	304	156	5367	1740	5.7 (5.1 – 6.3)	9.0 (7.7 – 10.4)	1.70	2.55 (1.75 – 3.72)	0.018	<0.000 1
1+ child patrons	152	46	170	31	5109	883	3.3 (2.8 – 3.8)	3.5 (2.5 – 5.0)	1.00 (ref)	1.00 (ref)		
<b>Courtenay place</b>												
No child patrons	1007	895	620	379	3723	2339	16.7 (15.5 – 17.9)	16.2 (14.8 – 17.8)	1.77	3.65 (0.94 – 14.17)	0.086	0.021
1+ child patrons	17	6	16	2	170	45	9.4 (5.7 – 14.5)	4.4 (0.4 – 15.7)	1.00 (ref)	1.00 (ref)		
<b>Total</b>												
No child patrons	2778	2355	1503	845	13,172	6862	11.4 (10.9 – 12.0)	12.3 (11.6 – 13.1)	3.09	3.1 (2.32 – 4.20)	<0.000 1	<0.000 1
1+ child patrons	193	67	205	44	5556	1115	3.7 (3.2 – 4.2)	3.9 (2.9 – 5.3)	1.00 (ref)	1.00 (ref)		

Note: Confidence intervals for the 2014 values for people smoking/all patrons % have been recalculated using the same methodology as used in this study to achieve comparable intervals.

**Table 6. Prevalence of active vaping in venues with and without children present (at cafes only) in Wellington city May 2018**

	Active vapers (n)	Adult patrons (n)	Ratio (%) (95% CI)	Risk ratio (RR)	P-value (two-tailed)
No children present n= 2355 venue observations	113	6862	1.6 (1.4 – 2.0)	6.12 (1.95 – 19.23)	0.0004
1+ children present n = 67 venue observations	3	1115	0.27 (0.05 – 0.8)	1.0 (ref)	

**Table 7. Comparison of active vaping and active smoking by people walking within 5m of observer at 3 different static observation points recorded in 10 minute blocks by location and time of day in Wellington city May 2018\***

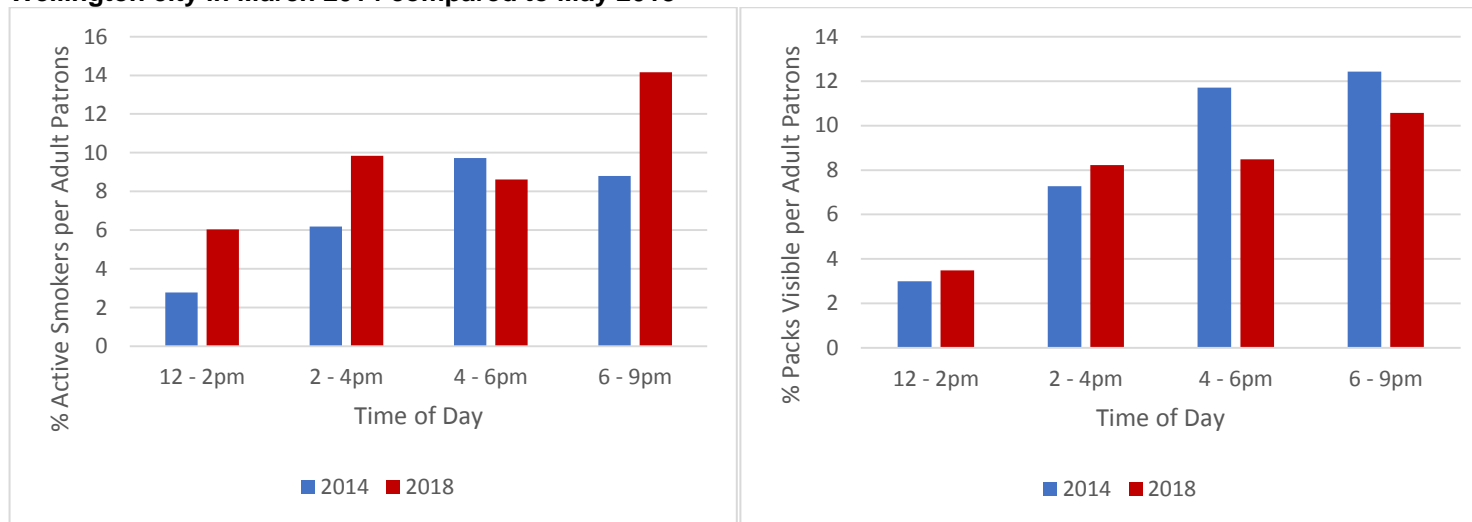
Setting and time of observation	Static observations(n)	Active vapers (n)	Active smokers (n)	Rate of active vaping observed per hour	Rate of active smoking observed per hour	Rate ratio of active smokers to active vapers
<b>Cuba Street</b>						
12 – 4pm	17	28	76	9.9	26.8	2.71
4 – 9pm	25	37	107	8.9	25.7	2.89
<b>Waterfront</b>						
12 – 4pm	16	4	10	1.5	3.75	2.5
4 – 9pm	24	17	19	4.25	4.75	1.12
<b>Courtenay Place</b>						
12 – 4pm	17	18	66	6.35	23.29	3.67
4 – 9pm	22	16	72	4.36	19.6	4.50
<b>Total</b>						
12 – 4pm	50	50	152	6	18.24	3.04
4 – 9pm	71	70	198	5.92	16.7	2.83
<b>All times all locations</b>	<b>121</b>	<b>120</b>	<b>350</b>	<b>5.95</b>	<b>17.36</b>	<b>2.92</b>

\*Observations in 2014 were collected between 5-8pm weekdays and 12-8pm on weekends, with the intention to collect data when patronage was highest. Observations in 2018 were collected between 3.30-9pm weekdays and 12-9pm on weekends, with the extended hours to compensate for the reduced sample size due to colder weather conditions.

**Table 8. The percentage of active smokers and percentage of packs displayed out of all adult patrons by time of day on the weekends only in Wellington in March 2014 and May 2018**

	Number of adult patrons		Number of active smokers		Number of packs displayed		% active smokers (95% CI)		% packs displayed (95% CI)	
	2014	2018	2014	2018	2014	2018	2014	2018	2014	2018
<b>12 – 2pm</b>	4567	630	127	38	137	22	2.78 (2.33 – 3.29)	6.03 (4.37 – 8.10)	3.00 (2.53 – 3.53)	3.49 (2.3 – 5.2)
<b>2 – 4pm</b>	4043	681	250	67	294	56	6.18 (5.48 – 6.97)	9.84 (7.77 – 12.25)	7.27 (6.51 – 8.11)	8.22 (6.3 – 10.5)
<b>4 – 6pm</b>	5239	731	510	63	613	62	9.73 (8.95 – 10.58)	8.62 (6.74 – 10.82)	11.70 (10.86 – 12.6)	8.48 (6.6 – 10.7)
<b>6 – 9pm</b>	5340	918	470	130	663	97	8.80 (8.07 – 9.59)	14.16 (12.02 – 16.53)	12.42 (11.56 – 13.33)	10.57 (8.7 – 12.7)

**Figure 2. The percentage of active smokers and packs displayed out of all adult patrons, averages (and 95% CI) by time of day on the weekends only in Wellington city in March 2014 compared to May 2018\***



\*Observations in 2014 were collected between 5-8pm weekdays and 12-8pm on weekends, with the intention to collect data when patronage was highest. Observations in 2018 were collected between 3.30-9pm weekdays and 12-9pm on weekends, with the extended hours to compensate for sample size due to colder weather conditions.

## Discussion

### Main findings and interpretation

The most important finding from this study is likely to be the reduction in packs visible on tables per active smoker; this was significantly lower in 2018 compared to 2014 (80% in 2018 and 126% in 2014,  $p < 0.0001$ ). This is very unlikely to be a weather-dependent result and suggests that smokers found the new standardised packs more aversive to look at. However, a potential confounder identified by Brennan et al for Australia was that “Increasing prices may have also reduced smokers’ willingness to display their pack to avoid being asked to share their cigarettes”.<sup>(25)</sup> This is probably of some relevance in this setting, given that cigarette prices in New Zealand have gone up substantially between 2014 and 2018 due to tobacco tax increases by the NZ Government. There may also be greater stigma surrounding smoking in 2018 compared to 2014, as New Zealand works towards the Government’s Smoke free 2025 goal. <sup>(28)</sup> These factors may have also contributed to these findings.

Our results also found a statistically significant reduction in the extent to which packs were displayed face up (i.e. a larger proportion of packs were displayed face down). This is consistent with the imagery on the front of the pack becoming much more aversive with the new larger pictorial warnings on the front, compared to the older pack design. This finding is also consistent with the results of a similar study carried out in Australia.<sup>(25)</sup> Nevertheless, a greater proportion of packs were described in this study of unknown type/orientation (20.6% in 2018 compared to 2.5% in 2014). This may reflect greater difficulty in the observers discerning pack orientation and type with the relative lack of branding in the new design.

The percentage of active smokers per patron was 6.5% higher in 2018, despite the decrease in the national prevalence of smoking during 2014 to 2018. The difference in weather conditions during the observations in this 2018 study (May, late autumn) compared to during observation in the 2014 study (March, early autumn) may explain some of this. The average temperature was 4°C lower (14°C in 2018 compared to 18°C in 2014) and the average wind speed 9kmph greater (27kmph compared to 18kmph). There was also five days of rain during the data collection period (see Appendix), while in the 2014 study, “days with very poor weather were avoided as patronage would have been atypical” <sup>(26)</sup>. Non-smoking patrons are probably more likely to sit indoors in bad weather, which may explain the increased proportion of active smokers observed per adult patron in 2018. Weather is unlikely to have influenced the display of packs or their orientation, as a typical venue has wind protection with over-head covering (Appendix 8); patrons and their packs are thus protected from most rain and wind. Those venues with no such wind/rain protection were unlikely to have seated patrons.

As in 2014, this study found that venues with children present had a statistically significant reduction in the prevalence of smokers and visible packs, compared to venues without children present. This is a favourable finding, as children are vulnerable to the effects of tobacco advertising, and that there are significant health risks associated with second hand smoke exposure.<sup>(6)</sup>

Our findings also reflect those in the 2014 study with regards to the pattern of smoking between the three Central Business District (CBD) areas. Courtney Place had the highest smoking prevalence, followed by Cuba Street, then the Waterfront, which had significantly lower rates. This is most likely due to the fact that the Waterfront is a much more children and family dominated area. An event which may have influenced this during observations in this study was the “Light Festival” occurring throughout the Waterfront area. This is likely to have disproportionately increased the number of family groups in the Waterfront area during evening data collection.

In regards to the prevalence of vaping in the CBD area, we found that while there was definitely a population of vapers, they were a minority compared to smokers. At the observed venues, 1.4% of adults were observed actively vaping, giving a ratio of 10 active smokers to one active vaper (the prevalence of active smokers was 14%). In comparison, during observation from static sites (ie, counting active smokers and vapers while walking), 2.92 active smokers were observed for every active vaper. This ratio of active smokers to active vapers is significantly lower than that observed at venues. This may suggest that vaping is not as normalised at hospitality venues but is difficult to determine because we have only investigated the ratio of smoking to vaping and not the prevalence.



We also found that vapers were far more likely to be observed at venues without children present (risk ratio of 6.12) than smokers (risk ratio of 2.68). This may show that smoking is more normalised than vaping in family environments, but the result may simply be due to the small population of vapers. The consequence of this small number is the large confidence interval (1.95 to 19.23) for the risk ratio. It is difficult to interpret these results due to the lack of up to date statistics regarding the prevalence of vaping in New Zealand society, particularly in the presence of children. Merry and Bullen have produced a systematic review which reports on three studies that have investigated the self-reported prevalence of vaping both currently and ever in New Zealand. (23) In the 2014 Health and Lifestyle Survey (HLS), 13% of the participants reported ever using an e-cigarette, with a much higher proportion of smokers reporting ever-use (50%) and a much lower proportion of never-smokers (3.4%). The HLS estimated current use (at least monthly) to be 4% amongst smokers and less than 1% in all study participants.

## **Strengths and limitations**

A key strength of this study was that it was able to repeat the methods of a study conducted prior to the advent of standardised packaging in this country. This allowed us to draw some conclusions about the effect of the introduction of standardised packaging on pack visibility and orientation at venues in central Wellington. This is only the second such repeat study in the world and our observations were uniquely carried out during the transition period, demonstrating the immediate effect of the new packaging. Also, our methods ensured that any possible transcription error or recall bias was minimised, through use of Google Sheets for data entry. This meant that there was no transfer of data from handwritten sheets or between documents, and no need to recall information for later entry.

Nevertheless, as the data collected was only in the Wellington CBD, we were not able to compare smoking rates and pack orientation between different socioeconomic (SES) groups. Higher SES groups can afford to eat out more and so these people probably will probably have been over-represented in the patrons observed. In addition, rental costs in the Wellington CBD are higher than in other Wellington areas, and so the venues selected in this study are more likely to be frequented by those of higher SES. Further research would be desirable in low-income areas and those with higher proportions of Māori and Pacific smokers.

As far as we are aware, our study is the first observational study to investigate the prevalence of vaping, indoors or outdoors and in the presence of children. Previous studies (e.g. (29) appear to have used survey data from reported observations.

In this study we found some limitations in collecting data on vaping vs smoking. During our observation from static sites, it was sometimes difficult to distinguish vaping devices from other handheld devices such as phones and keys. Vaping is also intermittent in nature, so observers were probably less likely to capture someone actively vaping compared to actively smoking. Active smokers will tend to smoke consistently for a set period, so were more likely to be observed and counted. Outside of daylight hours, it was also difficult to distinguish vaping devices as they do not light up in the way that cigarettes do. However conversely, the large vaping clouds are easy to identify. All of these factors could potentially skew our estimation of the number of vapers both in our sitting and venue observations, an issue which needs to be addressed in further studies that include such observations.

As in any observational study, there was a chance for human error in identifying smokers and packs. This may have been greater in our study compared to 2014, due to the increased amount of data collected outside of daylight hours. This may have led to underestimating the prevalence of smokers and packs and may partially explain the increased proportion of packs of 'unknown type/orientation' in this study compared to in 2014.

## **Possible implications for future research and policy**

Our study was conducted within the March-June 2018 transition period to standardised packs. It could be worth doing a follow-up study after the old packs have been completely phased out of circulation, as was conducted by Brennan *et al* at one year and two years post the introduction to standardised packaging.(25) This would be an effective way to

evaluate the continuing effect of standardised packaging over time, as there is a risk of desensitisation occurring, which may indicate the need for further steps such as the renewal of warning images.(30)

Evaluation of the effectiveness of this intervention is also important because the impact of this new policy has been contested by cigarette companies. Notably, British American Tobacco New Zealand said in a 2016 statement: "BATNZ hopes that the government will review all the evidence and be cautious about progressing a measure that has failed in Australia".(31) More evidence regarding the effect the change in packaging has had and will have, will be useful in future decisions regarding public policy relating to the marketing of tobacco products.

Another way that our study may be able inform public policy is in regards to legislation for smokefree outdoor public areas. Such policies have been introduced in a number of overseas jurisdictions e.g. (32). A bill has recently been introduced in New York City that, if passed, will prevent people from smoking as they walk around the city.(33) While such changes may be a long way from being introduced in New Zealand, it is useful to have some data to quantify the problem.

The New Zealand smoking culture has been undergoing change for over 30 years, with the Government goal to be 'smokefree' by 2025 as a recent part of the driving forces.(34) The acceptability of smoking in New Zealand public places appears to be decreasing and it would be useful to do further research on the factors involved in this change. (35) While collecting our data, we noticed that some venues had 'no smoking' signs even in outdoor areas, and we discussed the possibility of talking to venue managers and owners about their experiences and opinions of smoking on their premises. While it was beyond the scope for this study, further research could be done on these subjects; research could investigate whether venue owners perceive that there has been a change in the amount of patrons smoking, whether they are taking steps to reduce smoking in their venue and what the effect of the new vaping trend has been.

## Conclusion

Following the introduction of standardised packaging of cigarettes in NZ, this study found a statistically significant reduction in number of packs visible per active smoker observed. It also found a statistically significant reduction in the percentage of visible packs oriented face up when non-standardised packs in 2014 were compared to standardised packs in 2018. These changes support the idea that the introduction of standardised packaging makes packs less attractive and that it has been an effective intervention. Going forward, New Zealand needs other studies to investigate any links between the introduction of standardised packaging and other measures such as smoking uptake and prevalence.(25,36) This study could also be repeated to see if the effects of standardised packaging continue to hold over time and in areas with more low-income smokers present.

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## Appendices

### Appendix 1 - 2014 Venue List and Annotated Amendments

Original Venue Name	Route	Still exists in May 2018?	Address / Replacement	Replacement venue 2018	Still has smoking area outside	Notes
1. Havana Coffee	Cuba St	Yes	32 Wigan St		Yes	
2. Heaven	Cuba St	Yes	247 Cuba		Yes	
3. Fidel's	Cuba St	Yes	234 Cuba		Yes - include tarp covered area	
4. Rasa	Cuba St	CLOSED	Ekim - 257 Cuba	(Substituted with Ekim Burgers - original closed)		
5. Phoenician Cuisine	Cuba St	CLOSED	Five Boroughs - 245 Cuba	(Substituted with Five Boroughs - original closed)		
6. Bru	Cuba St	CLOSED	Bad Grannies - 195 Cuba	(Substituted with Bad Grannies - original closed)		
7. Wholly Bagels	Cuba St	CLOSED	Cafe Istanbul - 117 Cuba	(Substituted with Cafe Istanbul - original closed)		
8. EspressoHolic	Cuba St	Yes	136 Cuba		Yes	
9. Veni Vidi Vici	Cuba St	CLOSED	Noble Rot - 6 Swan Lane	(Substituted with Noble Rot Wine Bar - original closed)		

10. Mr Bun	Cuba St	CLOSED	The Aroma - 126a Cuba	(Replaced with The Aroma - same place, new ownership)		Closes 6pm Sun-Wed
11. Hotel Bristol	Cuba St	Yes	131 Cuba		Yes	
12. J.J. Murphy's	Cuba St	Yes	121 Cuba		Yes	
13. Plum	Cuba St	Yes	103 Cuba		Yes	Closes 6pm Sun-Wed
14. Felix	Cuba St	Yes	Cnr Cuba and Wakefield		Yes	Closes 6pm weekdays, 5pm weekends
15. Finc	Cuba St	Yes	Rogue & Vagabond - 18 Garrett St	(Substituted with The Rogue & Vagabond - no more outside smoking area)	No - replaced	Open after 3pm Fri/Sat
16. West Plaza Hotel	Cuba St	Yes	110 Wakefield		Yes (but with no smoking signs by one of the 4 tables)	
17. The Lido	Cuba St	CLOSED	Coco's Bar and Grill - 18 Willeston St	(Substituted with Coco's Bar and Grill - original closed)		Closed Sunday
18. Victoria St Café	Cuba St	Yes	Meow - 9 Edward St	(Substituted with Meow - no more outside smoking area)	No - replaced	Open after 6pm Saturday, Closed Sun/Mon
19. General Practitioner's	Cuba St	CLOSED	Little Beer Quarter - 6 Edward St	(Substituted with Little Beer Quarter - original closed)		Open after 3pm Sunday
20. Caliente	Cuba St	CLOSED	Pickle & Pie - 2 Lombard St	(Substituted with Pickle and Pie - original closed)		

21. Punch	Cuba St	CLOSED	The Green Man - 25 Victoria St	(Substituted with The Green Man - original closed)		Closed Sunday
22. Memphis Bell	Courtney Place	Yes	Pizzeria Napoli - 30 Courtenay Place	(Substituted with Pizzeria Napoli - tables inconsistent)	No smoking tables on rainy days	Closed between 3-5pm Tue-Sat, open after 5pm Sun/Mon
23. The Jimmy Cake	Courtney Place	CLOSED	Hanging Ditch - 14 Leeds St	(Substituted with Hanging Ditch - original closed)		
24. Hope Bros	Courtney Place	CLOSED	Eva Beva – 31 Dixon St	(Replaced with Eva Beva - same place, new ownership)		
25. The Residence	Courtney Place	Yes	120 Courtenay Place		Yes but no smoking signs - people still smoke over barrier	Open after 2pm weekdays, 12pm Fri/Sat
26. Electric Avenue	Courtney Place	CLOSED	132 Courtenay Place	(Replaced with Danger Danger - same place, new ownership)		Open after 4pm
27. The Bangalore Polo Club	Courtney Place	Yes	63 Courtenay Place		Yes	
28. KaPai	Courtney Place	CLOSED	The Grand Steakhouse - 69 Courtenay Place	(Substituted with The Grand Steakhouse - original closed)		
29. Vinyl	Courtney Place	Yes	68 Courtenay Place		Yes	
30. Sweet Mothers	Courtney Place	Yes – no more smoking though	Dakota - 74 Courtenay Place	(Substituted with Dakota - no more outside smoking)	No - strictly no smoking allowed in outdoor area	Open after 4pm

31. Malthouse	Courtney Place	Yes	48 Courtenay Place		Yes	
32. Crafty Tavern	Courtney Place	CLOSED	Shady Lady - 66 Courtenay Place	(Substituted with Shady Lady - original closed)		
33. Mishmosh	Courtney Place	Yes	Cnr Allen St & Courtenay Place		Yes	
34. Madame Peacock's	Courtney Place	CLOSED	Basque - 8 Courtenay Place	(Substituted with Basque - original closed)		
35. El Horno	Courtney Place	Yes	30 Courtenay Place		Yes	Open after 4pm
36. Nicolini's	Courtney Place	Yes	26 Courtenay Place		Yes	Open after 5.30pm
37. Minibar	Courtney Place	Yes	24 Courtenay Place		Yes	Open after 4pm
38. Hummingbird	Courtney Place	Yes	22 Courtenay Place		Yes	Open after 3pm
39. Kitty O'Shea's	Courtney Place	CLOSED	Siglo - 30 Courtenay Place	(Replaced with Siglo - same place, new name)		
40. Public	Courtney Place	CLOSED	Wellington Sports Cafe - 58 Courtenay Place	(Replaced with Wellington Sports Cafe - same place, new name)		
41. The Establishment	Courtney Place	Yes	16 Blair St		Yes	
42. Molly Malone's	Courtney Place	CLOSED	The Tasting Room - 2 Courtenay Place	(Substituted with The Tasting Room - original closed)		
43. Macs Brewery	Waterfront	Yes	4 Taranaki St		Yes	
44. St Johns Heineken	Waterfront	Yes	5 Cable St		Yes	
45. Te Raukura	Waterfront	Yes	2 Taranaki St	(Replaced with Karaka Cafe - same place, new	Yes	



				name)		
46. Tuatua	Waterfront	Yes	Zibibbo - 25 Taranaki St	(Substituted with Zibibbo - inconsistent tables)	No - weather dependent	Closed Sunday
47. Chicago Sports Café	Waterfront	CLOSED	Munchen - 6 Queen's Wharf	(Replaced with Munchen Food Hall - same place, new ownership)		
48. Bin 44	Waterfront	Yes	3 Queen's Wharf			Areas under construction
49. Dockside	Waterfront	Yes	3 Queen's Wharf		Yes	
50. Crab Shack	Waterfront	Yes	5 Queen's Wharf		Yes	
51. Mojo	Waterfront	CLOSED	Shed 5 - Shed 5 Queen's Wharf	(Substituted with Shed 5 - original closed)		Closed between 3pm-5.30pm
52. One Red Dog	Waterfront	Yes	56 Customhouse Quay		Yes	
53. Cuckoo	Waterfront	Yes	57 Customhouse Quay		Yes	Closed Sunday
54. Portofino	Waterfront	Yes	33 Customhouse Quay		Yes	
55.		Extra venue	33 Customhouse Quay, Waterfront	Foxglove		
56.		Extra venue	33 Customhouse Quay, Waterfront	Wagamama		

## Appendix 2 - Mapped Circuit



### Appendix 3 - Online Data Collection Form

## NEW Data Collection form:

New form for data collection in the smokers/vapers study

\* Required

Time: \*

- ☐ 12-12.30
- ☐ 12.30-1
- ☐ 1-1.30
- ☐ 1.30-2
- ☐ 2-2.30
- ☐ 2.30-3
- ☐ 3-3.30
- ☐ 3.30-4
- ☐ 4-4.30
- ☐ 4.30-5
- ☐ 5-5.30
- ☐ 5.30-6
- ☐ 6-6.30
- ☐ 6.30-7
- ☐ 7-7.30
- ☐ 7.30-8
- ☐ 8-8.30
- ☐ 8.30-9

#### Location - Cuba St

- ☐ Havana Bar
- ☐ Ekim Burgers
- ☐ Heaven
- ☐ Fidel's Cafe
- ☐ Five Boroughs
- ☐ Bad Grannies
- ☐ Noble Rot Wine Bar
- ☐ EspressoHolic
- ☐ The Rogue & Vagabond
- ☐ The Aroma
- ☐ Hotel Bristol
- ☐ J J Murphy & Co
- ☐ Cafe Istanbul
- ☐ Plum

#### Location - Waterfront

- ☐ Felix Cafe
- ☐ West Plaza Hotel
- ☐ Meow
- ☐ Little Beer Quarter
- ☐ Pickle and Pie
- ☐ The Green Man Pub
- ☐ Coco's Bar and Grill
- ☐ Wagamama
- ☐ Portofino
- ☐ One Red Dog
- ☐ Foxglove
- ☐ Cuckoo
- ☐ Shed 5
- ☐ Crab Shack
- ☐ Dockside
- ☐ Bin44
- ☐ Munchen
- ☐ Mac's Brewbar
- ☐ St John's Bar and Restaurant
- ☐ Karaka Cafe
- ☐ Zibibbo

**Location - Courtenay Place**

- ☐ Danger Danger
- ☐ The Residence
- ☐ Dakota
- ☐ Shady Lady
- ☐ Vinyl
- ☐ Wellington Sports Cafe
- ☐ The Malthouse
- ☐ Mishmosh Bar
- ☐ El Horno
- ☐ Pizzeria Napoli
- ☐ Siglo
- ☐ Nicolini's
- ☐ Minibar
- ☐ Hummingbird
- ☐ The Establishment
- ☐ Basque
- ☐ The Tasting Room
- ☐ The Bangalore Polo Club
- ☐ The Grand Steakhouse
- ☐ Eva Beva
- ☐ Hanging Ditch

**Total Adult Patrons: \***

Your answer

**Total Child Patrons (<12yrs old):**

Your answer

**Children within 10m of an active smoker:**

Your answer

**Total ACTIVE smokers:**

Your answer

**Total ACTIVE vapers**

Your answer

**Total Vaping devices (only those NOT active):**

Your answer

**ROLL YOUR OWN/POUCHES - face UP**

Your answer

**ROLL YOUR OWN/POUCHES - face DOWN**

Your answer

**ROLL YOUR OWN/POUCHES - Unknown Orientation**

Your answer

**OLD acks face up**

Your answer

**OLD packs face down**

Your answer

**OLD packs on side, top bottom:**

Your answer

**OLD packs partly concealed:**

Your answer

**NEW packs face up**

Your answer

**NEW packs face down**

Your answer

**NEW packs on side, top, bottom:**

Your answer

**NEW packs partly concealed (by phone/wallet):**

Your answer

**Total in a case/tin:**

Your answer

**Total can't get close enough to discern (unknown type/orientation)**



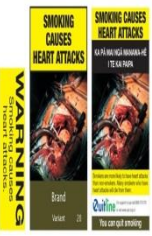
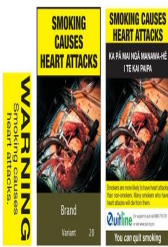
Your answer

**SUBMIT**

Never submit passwords through Google Forms.

# Appendix 4 – Images of Packs, Devices and Orientations Used for Observer Training Purposes

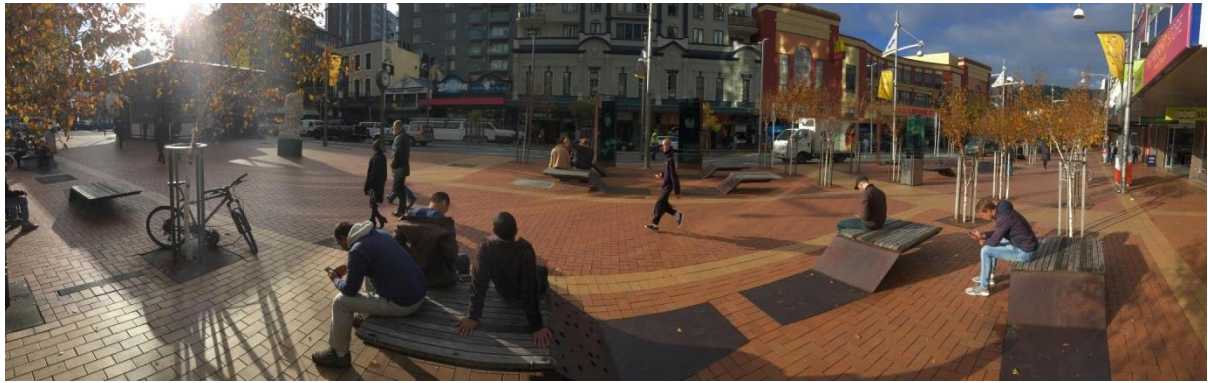
VAPES	ROLL YOUR OWN	OLD PACKAGING	NEW PACKAGING
	  	   	    

Not concealed	Concealed	Partially concealed	Face up	Face down
 <ul style="list-style-type: none"> <li>Lighter</li> <li>Nothing</li> </ul>	 <ul style="list-style-type: none"> <li>Case</li> </ul>	<p>Anything on table but under something eg:</p> <ul style="list-style-type: none"> <li>Phone</li> <li>Wallet</li> </ul>	 <p>Look for:</p> <ul style="list-style-type: none"> <li>Brand name</li> </ul>	 <p>Look for:</p> <ul style="list-style-type: none"> <li>Quitline</li> </ul>



## Appendix 5 – Observation points for static observation of walking smokers and vapers

### *Courtney Place*



### *The Waterfront*



### *Cuba St*



## Smokers/Vapers that are walking:

To be used when sitting still watching people go past a certain point in a given time (to be decided)

\* Required

### Day \*

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday
- ☐ Friday
- ☐ Saturday
- ☐ Sunday

### Date \*

- ☐ 16/05/18
- ☐ 17/05/18
- ☐ 18/05/18
- ☐ 19/05/18
- ☐ 20/05/18
- ☐ 21/05/18
- ☐ 22/05/18
- ☐ 23/05/18
- ☐ 24/05/18
- ☐ 25/05/18
- ☐ 26/05/18
- ☐ 27/05/18

**Time: \***

- ☐ 12-12.30
- ☐ 12.30-1
- ☐ 1-1.30
- ☐ 1.30-2
- ☐ 2-2.30
- ☐ 2.30-3
- ☐ 3-3.30
- ☐ 3.30-4
- ☐ 4-4.30
- ☐ 4.30-5
- ☐ 5-5.30
- ☐ 5.30-6
- ☐ 6-6.30
- ☐ 6.30-7
- ☐ 7-7.30
- ☐ 7.30-8

**Location: \***

- ☐ Cuba St
- ☐ Waterfront
- ☐ Courtenay

**Number of Smokers: \***

Your answer

**Number of Vapers: \***

Your answer

**SUBMIT**

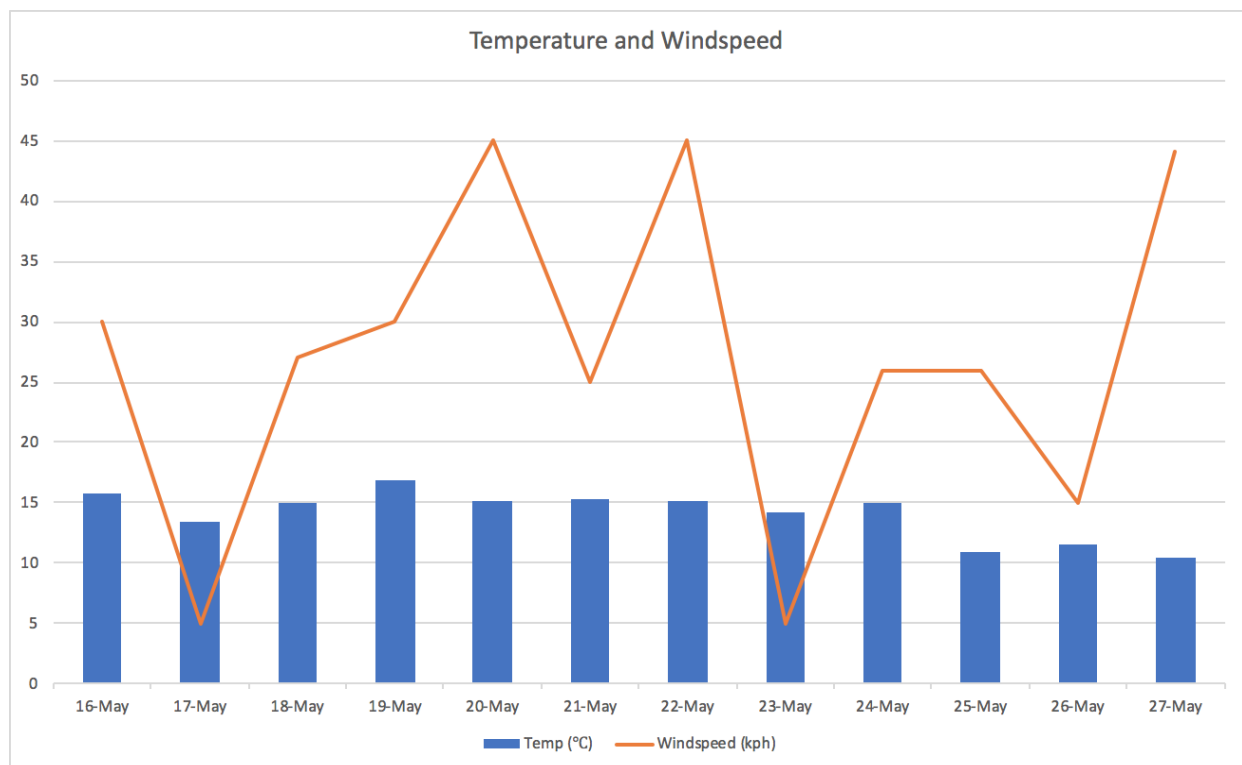
Never submit passwords through Google Forms.

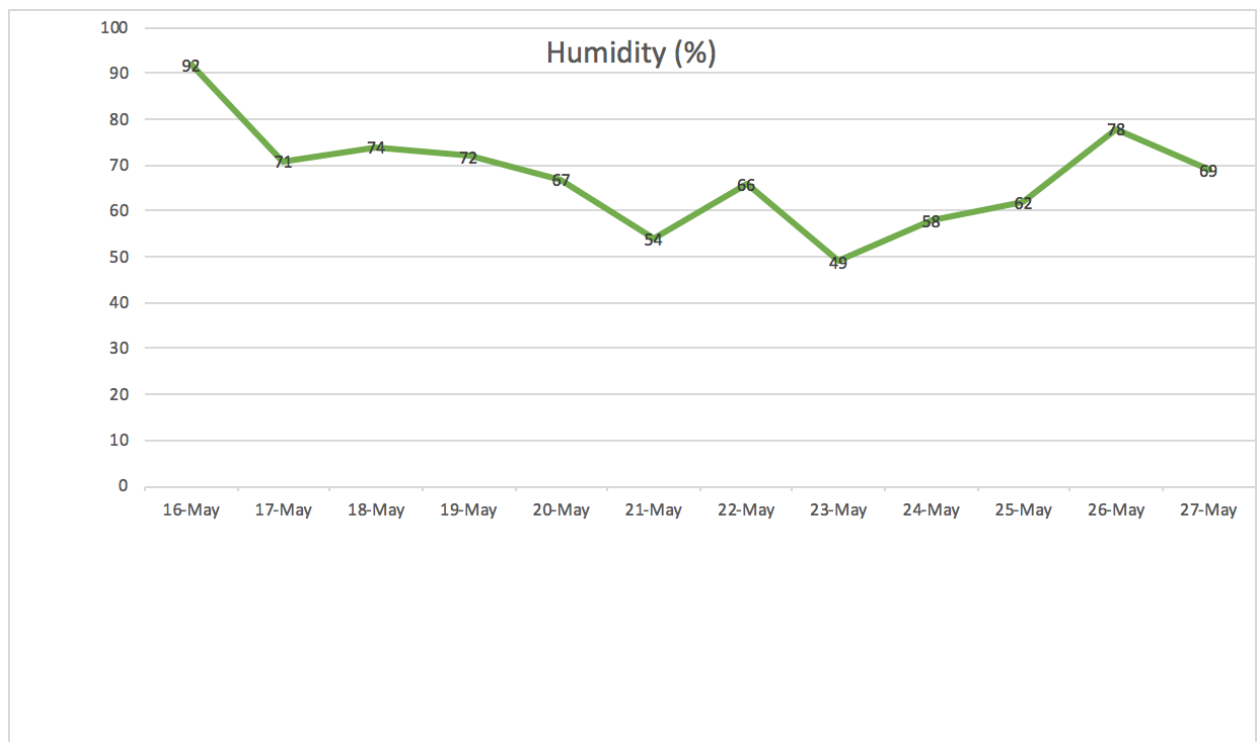
This form was created inside of Crimson Education. [Report Abuse](#) - [Terms of Service](#) - [Additional Terms](#)

Google Forms

## Appendix 7 - Weather

Date	Temp (°C)	Humidity (%)	Windspeed (km/h)	Conditions
16-May	15.7	92	30	Raining (moderate rain).
17-May	13.4	71	5	Cloudy, Spitting on and off.
18-May	15	74	27	Cloudy, no rain.
19-May	16.9	72	30	Mostly sunny
20-May	15.1	67	45	Clear with periodic clouds.
21-May	15.3	54	25	Mostly sunny
22-May	15.2	66	45	Light Drizzle
23-May	14.2	49	5	Cloudy with Drizzle.
24-May	15	58	26	Cool
25-May	11	62	26	Partly Sunny
26-May	11.5	78	15	Broken Cloud.
27-May	10.5	69	44	Cloudy with light rain, worsening towards evening.
<b>Mean</b>	<b>14.06666667</b>	<b>67.66666667</b>	<b>26.91666667</b>	
<b>Max</b>	<b>16.9</b>	<b>92</b>	<b>45</b>	
<b>Min</b>	<b>10.5</b>	<b>49</b>	<b>5</b>	







Appendix 8 – Examples of the rain/wind protection of the outdoor seating areas in this study



















## Appendix 9 – Ethical Considerations

The wider topic of smoking and standardised packaging touches on numerous ethical issues. The issues particularly pertinent to our study include the health inequities present between Māori and non-Māori due to differences in smoking prevalence. There are also ethical considerations around standardised packaging, the exposure of children to smoking and tobacco products, and the possible stigmatization of smokers.

A common ethical argument against tobacco control and comparable policies is that it increases stigmatization, which is unethical because stigmatization is dehumanizing. This argument is of course dependent on a certain interpretation of stigmatization, such as that by Scott Burris. (37) Although stigmatization can be dehumanizing, it is certainly not always so. Andrew Courtwright makes a compelling argument for this. (38) He provides a contractualist<sup>1</sup> framework for judging if a policy, which introduces or increase stigmatization of detrimental health behaviours could be ethically permissible. The framework provides a basis for what could be justified to reasonable individuals whom the policy could effect.

An important ethical consideration around standardized packaging and the addition of health warnings is their effect on autonomy. A strong case can be made for the inclusion of health warnings, especially like those seen on standardized packaging with large, contrasted writing. When presented in that format they increase both comprehension and knowledge of health risks associated with smoking.

And building on that, pictorial health warnings have been found to improve information processing and retention of the health warning. (4) Therefore a strong argument can be made that the pictorial health warnings in fact enhance the autonomy of consumers by providing them with the knowledge to make a more informed decision. These warnings are as would be expected, also effective in enhancing cognitive processes of the health warnings in adolescents and may reduce smoking intentions. (39)

Additionally pictorial health warnings may help to reduce informational disparities often seen between more and less educated parts of society. With evidence suggesting that nations with pictorial health warnings on their packs have reduced disparities between educational levels in their tobacco related health knowledge. (4)