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Paying the price: A cross-sectional survey of Australian socioeconomically disadvantaged smokers' responses to hypothetical cigarette price rises

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25 **Abstract**

26 **Introduction and Aims:** Increases in tobacco taxation can lead to reductions in tobacco
27 consumption and prevalence of use, across social groups. However, use of price-minimisation
28 strategies to manage current and future tobacco use and the role of financial stress is less
29 understood. This study aimed to measure the effect of cigarette price increases on price-
30 minimisation strategy endorsement and financial stress among socioeconomically disadvantaged
31 smokers.

32 **Design and Methods:** Community Service Organisation welfare recipients in NSW, Australia
33 completed a touchscreen survey. Smoking history, financial stress, highest price-to-quit and
34 responses to hypothetical cigarette price increases were assessed.

35 **Results:** Participants were 354 smokers (response rate=79%). Most participants received their
36 income from a government pension (95%), earned <AUD\$300/week (55%), had not completed
37 secondary schooling (64%), were moderately or heavily nicotine dependent (60%), reported high
38 financial stress (66%) and spent AUD\$56/week on tobacco. In 10% and 20% price rise
39 hypotheticals, significantly more participants endorsed trying to quit ($p<0.001$), and fewer selected
40 no change to their smoking ($p<0.001$) in response to the larger increase scenario. Numerous price-
41 minimisation strategies (e.g. switching to cheaper brands/products) were endorsed, but remained
42 constant across hypothetical scenarios; level of financial stress appeared to have little influence.
43 Smokers indicating they would not change their smoking in response to price rises had higher levels
44 of nicotine dependence.

45 **Discussion and Conclusions:** Socially disadvantaged smokers endorsed numerous price-
46 minimising strategies to maintain smoking at hypothetically increased costs. Larger cigarette price
47 rises motivated more smokers to consider quitting, while price-resistant smokers appeared to have a
48 more entrenched smoker status.

49

50 **Key words:** smoking; social disadvantage; tobacco price

51 INTRODUCTION

52 Tobacco use is the single most preventable cause of death in the world, a known risk factor for six
53 of the eight leading causes of death worldwide, and accounts for approximately five million deaths
54 per year (1, 2). Population smoking prevalence has significantly declined in western countries over
55 recent decades to levels between 16 – 20% (1, 3). However, there exists a social gradient in
56 smoking rates with an inverse relationship between income level and tobacco use (4). Factors
57 related to social disadvantage such as long-term unemployment, low educational attainment and
58 income, belonging to a minority racial group, and living in low socioeconomic status (SES) areas,
59 place individuals at higher risk of smoking (5-11).

60
61 Taxation is widely recommended as one of the key policies for a comprehensive tobacco control
62 strategy (12-15). Typically tobacco taxation involves applying an excise duty that sets a required
63 amount payable per specified quantity of product; a number of ad valorem taxes may also be
64 applied (16). In Australia, the retail price of cigarettes consists of an excise duty tax of
65 approximately 54.7% (17) and a 9.1% Goods and Services Tax (16). In Australia in April 2010
66 tobacco excise duty was raised by 25%, resulting in a real price increase of AUD\$2.20 for a pack of
67 30 cigarettes. The World Health Organisation recommends that excise tax alone should be 70% of
68 the final price of tobacco products (18).

69
70 Smokers respond to cigarette price increases in a number of ways. Firstly, they may quit smoking,
71 which is the primary aim of the strategy. This response is evident in reduced prevalence rates (19,
72 20), as well as increases in quit attempts, intentions and motivation following price increases (21-
73 23). Increases in tobacco excise taxes which increase product prices can effectively demonstrate a
74 reduction in overall tobacco consumption and prevalence of use by promoting cessation, preventing
75 initiation and lowering consumption (19). Findings from the International Tobacco Control Four

Country (ITC-4) survey suggest that smokers living in areas with higher cigarette prices and taxes are significantly more motivated to quit (23), and are also more likely to report quit intentions in response to hypothetical price increases (22). In Australia, tobacco tax reforms during the National Tobacco Campaign in the late 1990's resulted in reductions of smoking prevalence, heaviness of smoking, and consumption (20).. In 2010 another 25% tobacco tax increase in Australia was found to increase smokers' cessation cognitions and quit attempts (21).

Secondly, smokers participate in what have been termed 'price-minimising strategies' which include seeking low/untaxed sources, switching to cheaper brands or products, buying in bulk, and reducing consumption. The use of price-minimisation strategies is common. A US study found 74% – 78% of smokers reported using at least one type of strategy to save money in the past year (24, 25), while analysis of ITC-4 data found that 65% of smokers reported using at least one price-minimising strategy at time of last purchase (26). There is some concern that such strategies may reduce the impact of price increases, as price-minimisation behaviours have been associated with reductions in quit attempts and successful cessation (24, 26, 27). Low SES smokers were more likely to engage in one or more of these price-minimisation behaviours compared to high SES smokers (28).

Finally, smokers may respond to price increases by making no change and continuing to purchase and use cigarettes as before the price increase. This may result in smokers experiencing financial stress: an inability to pay for household essentials and living expenses such as food, bills and rent due to a shortage of money (29-32). Financial stress can lead to a reduction in the likelihood of making quit attempts (30, 32) and succeeding in cessation (33). Modelling studies suggest the experience of financial stress may moderate the effect of price increases, and predict that as the proportion of low-income smokers experiencing financial stress increases, the impact of increasing

101 cigarette prices will lessen (34). Using smoking to cope with stress, or low self-efficacy to quit
 102 stemming from a lack of control associated with material deprivation are suggested mechanisms
 103 behind the positive relationship between smoking and financial stress (30). Smokers experiencing
 104 financial stress may be more likely to maintain smoking behaviour by making no changes or using
 105 price-minimising strategies. Further research in this area will help guide equitable and effective
 106 tobacco taxation policy development.

107

108 It is well established that low SES smokers are responsive to tobacco price rises (19). Less
 109 understood is how socially disadvantaged smokers might use price-minimisation strategies to
 110 manage future price rises and if the experience of financial stress influences this. Gaining this
 111 understanding is important as it may provide some information as to why socially disadvantaged
 112 groups continue to display high rates of smoking and low quitting success rates(35) in the face of
 113 increasing taxation. The main objective of this study is to assess socioeconomically disadvantaged
 114 smokers' reactions to hypothetical 10% and 20% cigarette pack price rises. Specifically, the study
 115 will:

- 116 1. Assess self-reported reactions to hypothetical price rises as measured by
 - 117 a. Use of price-minimisation strategies
 - 118 b. Intention to quit
 - 119 c. Intention to make no changes to smoking behaviour
- 120 2. Examine how financial stress is associated with smokers self-reported reactions to the
 - 121 hypothetical price rises
- 122 3. Examine the self-reported price threshold for motivating smokers to quit smoking
- 123 4. Identify socio-demographic and smoking behaviour characteristics among smokers resistant
 - 124 to change in response to price rise hypotheticals.

125

126 **METHODS**

127 **Study Design**

128 A cross-sectional survey administered through a touchscreen computer was conducted between
129 March and December 2012.

130

131 **Setting & Sample**

132 Strategies for sampling difficult-to-reach groups (socially disadvantaged smokers) were used (36,
133 37). The sample was drawn from a large non-government, social and community service
134 organisation (SCSO) servicing a broad catchment area in south-western Sydney, New South Wales.
135 This area has a population of 145,967 and is among the state's most disadvantaged (38). The SCSO
136 provides welfare, counselling and financial assistance services to disadvantaged members of the
137 local community. Long-term unemployed, single parents, and Aboriginal and Torres Strait Islanders
138 are over-represented as SCSO service users (39). Eligible participants were clients of the SCSO
139 seeking emergency relief assistance (i.e. food vouchers, grocery items, financial aid); aged over the
140 age of 18 years; able to read and/or speak English; were not too ill or distressed (as judged by
141 SCSO staff) to participate, and current smokers of cigarettes. Smokers were identified by the survey
142 question "Do you currently smoke tobacco products?" with response options: 'Yes, daily'; 'Yes, at
143 least once a week'; 'Yes, but less often than once a week' and; 'No, not at all', followed by "Have
144 you smoked at least 100 cigarettes or a similar amount of tobacco in your life" (yes/no/not sure).
145 Those who reported smoking daily, or who reported smoking occasionally as well as having
146 smoked 100 cigarettes were classified as current smokers.

147

148 **Recruitment and Data Collection**

149 Staff informed clients about an independent survey taking place within the SCSO when they
150 attended for a regular pre-scheduled appointment. Interested clients were introduced to a research

151 assistant who gained informed consent and provided assistance in completing the survey if required.
 152 Participants received a \$20 grocery voucher as reimbursement for participation. The study received
 153 approval from the University of Newcastle's Human Research Ethics Committee.

154

155 **Survey Instrument**

156 This survey was part of a larger study investigating perceptions of socially disadvantaged smokers.
 157 Only the results from the taxation and pricing items are reported here.

158

159 ***Tobacco use behaviour.*** Number of cigarettes smoked per day, ever tried to quit, and number of
 160 quit attempts in past 12 months were assessed. Nicotine dependence was measured using the
 161 heaviness of smoking index which assesses time to first cigarette and number of cigarettes per day
 162 (40). Smoking-induced deprivation was assessed by asking "In the last six months has there been a
 163 time when money you spent on cigarettes resulted in not having enough money for household items
 164 such as food (Y/N)?" (29). Price impact on current smoking behaviour was assessed by asking "For
 165 you personally, how often does the price of cigarettes influence..." with the following smoking
 166 behaviours listed: 'how much you smoke'; 'where you buy cigarettes'; 'the brand you smoke'; and
 167 'the type of product you smoke (e.g. roll-your-own, tailor-made)'. Items were rated on a 5-pt Likert
 168 scale (1-never; 2-sometimes; 3-often; 4-always; 5-unsure). Participants were asked "How much do
 169 you spend on average on tobacco each week?"

170 ***Price-minimising behaviours.*** To assess use of price-minimising strategies, participants were
 171 presented with two hypothetical scenarios: 1) "If there was a 10% price increase, the average price
 172 of a 25-pack of cigarettes would increase by approximately \$1.65 per pack. If this happened would
 173 you..." and; 2) "If there was a 20% price increase, the average price of a 25-pack of cigarettes
 174 would increase by approximately \$3.30 per pack. If this happened would you..." Participants tick-
 175 box selected as many response options as applied: 'make no changes to my smoking'; 'smoke more

176 of each cigarette'; 'smoke less – cut down the number of cigarettes smoked per day'; 'buy a smaller
 177 amount of tobacco or cigarettes at a time'; 'try to quit'; 'buy lower priced brands'; 'buy in bulk (e.g.
 178 cartons)'; 'use loose tobacco/roll-your-own'; 'buy unbranded tobacco, such as chop chop'; and
 179 'unsure'.

180 **Highest price to quit.** Smokers selecting 'make no change' in response to hypothetical price
 181 increases they were asked "What price would a pack of 25 cigarettes need to get to for you to stop
 182 smoking?"

183 **Financial stress.** Participants were asked "In the past six months, did any of the following happen
 184 to you because of a lack of money (Y/N)?" with the following events listed: 'could not pay
 185 electricity, gas, or telephone bills on time', 'could not pay the mortgage or rent on time', 'pawned
 186 or sold something', 'went without meals', 'was unable to heat or cool home', 'asked for financial
 187 help from friends or family', 'asked for help from a welfare/community organisation' (31). A 'yes'
 188 response to any category was classified as an instance of experiencing financial stress. Participants
 189 were also asked "Could you raise AUD\$2000 in a week if there was an emergency (Y/N)?" A 'no'
 190 response was classified as an instance of financial stress. A financial stress index was created to
 191 report the number of smokers experiencing no financial stress (zero instances), low financial stress
 192 (1 – 4 instances) or high financial stress (5 – 8 instances).

193 **Socio-demographic characteristics.** Gender, age, weekly personal income, income source,
 194 Indigenous status, marital status, highest level of education and housing type were assessed.

195

196 **Statistical Analyses**

197 Analyses were conducted using Stata Version 11 (<http://www.stata.com>). Categorical variables have
 198 been reported as percentages and continuous variables reported as means and standard deviations,
 199 or medians and quartiles where data were not normally distributed. Proposed use of each price-
 200 minimising strategy was compared between the 10% and 20% price increase scenarios using the

Stuart Maxwell test for marginal homogeneity. The chi-squared test was undertaken to determine whether the price-minimisation strategy selections differed by level of financial stress, within each of the price increase scenarios.

Chi-squared analyses were undertaken to compare demographic (age, gender, Indigenous status, income, marital status, education, housing, financial stress) and smoking characteristics (tobacco expenditure, previous quit attempts, smoking-induced deprivation, nicotine dependence) of smokers who said they would or would not make changes in response to tobacco price increases. Weekly tobacco expenditure was categorised as $\leq \$24$, $\$25-\49 , $\$50-\74 , $\geq \$75$, and 'number of quit attempts in previous 12 months' categorised as zero; one; two – four or $\geq$ five, to provide a more logical framework for interpretation, as we were interested in low, mid-range and high levels of spending and quit attempt behaviour. Backward stepwise logistic regression modelling was then undertaken with the initial model including all demographic and smoker variables with a p -value of 0.25 or less on bivariate analyses. Variables were removed if they had a p -value of 0.1 or more on the likelihood ratio test to produce a parsimonious model.

Sample size

Sample size for this study was determined by requirements for another trial for which participants were recruited. Post hoc power calculations demonstrated that a sample of 350 smokers would allow: estimation of tobacco use behaviours with 95% confidence intervals of $\pm 5\%$ for binary variables and ± 0.1 standard deviations for continuous variables; detection of differences between groups (participants with low versus high financial stress; and smokers who are and are not resistant to change following price increase) of 15%-20% for binary explanatory factors and 0.3-0.4 standard deviations for continuous explanatory variables, with 80% power and a 5% significance level.

226 **RESULTS**

227 **Sample**

228 During the survey period a total of 787 clients attended the centre, 738 were approached by SCSO
 229 staff, 608 met with the research assistant, and 581 completed the survey (79% consent rate). A total
 230 of 362 screened positive as smokers (62%), however a further eight were excluded for primarily
 231 smoking a form of tobacco other than tailor-made or roll-your-own cigarettes. The demographic
 232 details of the sample ($N = 354$ smokers) are presented in Table 1. The majority of the survey sample
 233 were female (61%), aged between 18-39yrs (58%), had not completed secondary schooling (64%),
 234 resided in government housing (52%), received income from a government pension (95%) and
 235 earned below the poverty line (55% , <AU\$300/week). All participants reported experiencing
 236 financial stress, while 66% experienced 'high' financial stress.

237

238 ****Table 1 about here****

239

240 **Tobacco use behaviour**

241 On average, participants consumed 16.4 ($SD = 11.3$) cigarettes per day and reported to spend an
 242 average of AU\$56.07 ($SD=37.34$) on tobacco each week. The majority had previously tried to quit
 243 ($n=295$; 83%), reporting an average of 3.3 ($SD = 7.7$) quit attempts in the past 12 months, and most
 244 were moderately ($n=153$; 43%) or heavily nicotine dependent ($n=66$; 18%). Most participants
 245 reported that the price of cigarettes 'always' or 'often' influenced how much they smoke (64%), the
 246 place of purchase (74%), the brand they smoke (62%), and the type of product they smoke (58%).
 247 Smoking-induced deprivation was experienced by 41% ($n=145$) of participants.

248

249 **Responses to hypothetical price rise scenarios**

Responses to hypothetical price increases are presented in Table 2. The most popular response endorsed in both scenarios was ‘try to quit’, and the number of participants selecting this strategy significantly increased from 40% in the 10% scenario to 50% in the 20% scenario ($p < 0.001$). Selection of price-minimisation strategies did not vary across the two hypothetical scenarios; the most popular strategies were to ‘buy lower priced brands’ and ‘smoke less’.

255

Table 2 about here

257

258 **Financial stress and hypothetical price rise responses**

Participants experiencing high financial stress were more likely to be unsure about what they intended to do for a hypothetical 10% price rise (12%) relative to those with low financial stress (3%), and more likely to endorse purchasing lower priced brands if there was a 20% increase in cigarette price (31% vs. 21% for high vs. low financial stress participants). There were no other differences in response strategies for either the 10% or 20% price increase scenarios by financial stress.

265

Table 3 about here

267

268 **Highest price to quit**

Participants selecting ‘make no change’ in response to either 10% or 20% price rise hypotheticals ($N = 99$) were asked what price a 25-pack of cigarettes would need to reach before they would quit smoking. The median price reported was AU\$25; and AU\$20 at the first quartile and AU\$50 at the third quartile. The price nominated did not differ by experience of low versus high financial stress on the Kruskal-Wallis test ($H = 0.379$, 1 d.f., $p = 0.538$).

274

275 **Characteristics of smokers resistant to change**

276 The final model of the logistic regression comparing demographic and smoking characteristics for
 277 participants who said they would ‘make no change’ compared to those who selected a strategy for
 278 change in response to the hypothetical price increase scenarios is presented in Table 4. Participants
 279 who had higher levels of nicotine dependence, spent significantly higher amounts of money on
 280 tobacco each week, made significantly fewer serious quit attempts in the past 12 months, were
 281 male, and those whose highest education level was a TAFE diploma or trade qualification had
 282 higher odds of selecting ‘make no change’ in response to price increase hypothetical scenarios.

283

284 ****Table 4 about here****

285

286 **DISCUSSION**

287 The study found that although socially disadvantaged smokers are influenced by cigarette price and
 288 are interested in quitting, they also make use of price-minimisation strategies. Strategies commonly
 289 endorsed during price rise hypotheticals included switching to cheaper brands and reducing
 290 consumption. The study found that larger price increases were most likely to encourage more
 291 smokers to consider quitting. Despite this, there appears to be a large proportion of smokers who are
 292 resistant to price changes, with a possible reason for this being their high nicotine addiction.

293

294 Socially disadvantaged smokers endorse use of numerous price-minimisation strategies to manage
 295 the current and hypothetically increased cost of cigarettes, consistent with general population
 296 findings.(24, 28) There is concern that use of price-minimisation strategies may decrease public
 297 health benefits of cigarette tax increases.(24, 26) In this study, strategy selection was consistent
 298 across price rise scenarios, however not all strategies were endorsed equally. Reducing consumption
 299 and switching to cheaper brands were preferred. Evidence suggests it is the magnitude of a price

300 increase that is the most important predictor of quit intentions.(22, 23) In the current study, larger
301 hypothetical price increases resulted in significantly fewer smokers choosing to make no change,
302 and more endorsing quit attempts. Larger tobacco tax increases that reduce product affordability,
303 and limit the ability of smokers to adapt using price-minimisation strategies should be explored in
304 simulation studies.

305

306 Level of financial stress appeared to have little influence on selection of price-minimisation
307 strategies. Smokers experiencing high compared to low financial stress expressed more uncertainty
308 about responses to smaller price rises, and preferred to adapt to larger increases by switching to
309 cheaper brands, however no other differences were observed. The entire sample experienced some
310 financial stress and this may have led to a ceiling effect; price already influences current purchasing
311 behaviour, therefore most available strategies are likely to be endorsed to manage future prices.
312 Alternatively, financial stress may operate on an unconscious level, more likely to impact on
313 perceptions of current behaviour, rather than on predictions of future behaviour. Disadvantaged
314 smokers are known to have reduced temporal horizons and higher impulsivity,(41, 42) indicating
315 they may be unable to accurately plan long-term, financially strained smoking behaviour.

316

317 Price-resistant smokers nominated AUD\$25 for a 25-pack of cigarettes as the price to motivate
318 quitting – a figure AUD\$10 higher than the average price in Australia at the time of survey. This is
319 consistent with recent research assessing price points for quit intentions among Australian smokers,
320 which found 80 cents per stick was a critical price point, while AUD\$1 was threshold (43). Tax
321 increases large enough to see a 25-pack of cigarettes in Australia cost $\geq$ AUD\$20 would prompt
322 over 60% of smokers who are able to nominate a price-to-quit, to seriously consider quitting
323 smoking, and would be particularly effective among low-SES smokers (43). The Australian

324 Government recently announced plans to increase tobacco taxes. This should be closely monitored
325 by future research.

326

327 Price-resistant smokers in this study had a more entrenched smoker status. These smokers had
328 higher levels of nicotine dependence, smoked more cigarettes per day, spent more money on
329 tobacco each week and made fewer serious quit attempts in the past 12 months than price-
330 responsive smokers. These smokers may find it more difficult to quit, and require comprehensive
331 nicotine dependence treatment concurrently with price rises. Additional research is needed to
332 measure unintended consequences of tobacco price rises such as impact on the limited resources
333 funding basic living requirements among smokers already facing significant socioeconomic
334 disadvantage.

335

336 *Strengths and weaknesses*

337 The use of a cross-sectional design with a convenience sample drawn from a single site is the
338 primary weakness of this study, limiting external validity and ability to generalise beyond the
339 sample. However, the large sample of hard-to-reach, highly addicted and disadvantaged smokers is
340 a study strength, providing unique and relevant information for tobacco control policy development
341 (36, 37). The current sample included a large representation of Indigenous, low income and low
342 education smokers living in government housing and obtaining welfare crisis aid. Few tobacco
343 control studies have been conducted with equivalent samples. A second weakness of the study is the
344 use of stated preferences for hypothetical scenarios, as we can only estimate pre-defined anticipated
345 and not actual behaviours.

346

347 *Conclusions*

348 The results of this research suggest that socially disadvantaged smokers are managing the cost of
349 tobacco through the use of numerous price-minimisation strategies. Financial stress appeared to
350 have little impact on responses to hypothetical price rises, however further research is needed to
351 confirm this finding. Although there is clear interest and intent to quit among these smokers, it
352 appears that the stronger the level of addiction, the less likely an individual is to quit smoking,
353 given a specific price increase. Larger tobacco price increases may be more effective than regular
354 small increments to gain the most impact among disadvantaged smokers. Socially disadvantaged
355 smokers may require additional dependence treatment to help them quit during price increases, in
356 order to maximise quit success and minimise negative consequences in other areas of their financial
357 situation.

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Table 1. Demographic characteristics of the 354 study participants.

Characteristic	n	%
Age		
18 – 39	206	58
≥40	148	42
Gender		
Male	138	39
Female	216	61
Aboriginal & Torres Strait Islander status		
Indigenous	64	18
Non-Indigenous	290	82
Marital Status		
Married / De facto / living with partner	87	25
Separated / divorced	103	29
Never married / single / widowed	164	46
Highest Education		
Primary school	12	3.4
High school years 7-10	214	61
High school years 11-12	51	14
TAFE / trade qualification	64	18
University degree	13	3.7
Personal Weekly Income		
≤\$299	195	55
≥\$300	137	39
Prefer not to answer	22	6.2
Income source		
Paid work	13	3.7
Centrelink (Government pension)	335	95
Other	6	1.7
Housing type		
Own house / private rental	108	31
Government rental	184	52
Homeless or supported accommodation	62	18
Financial stress		
No financial stress	0	0
Low financial stress	121	34
High financial stress	233	66

Table 2. Participant responses to hypothetical cigarette price increase scenarios (n = 354).

Strategy^a	10% price increase <i>n</i> (%)	20% price increase <i>n</i> (%)	Difference <i>p</i>-value^b
Make no change	96 (27.12)	61 (17.23)	<0.001
Try to quit	141 (39.83)	177 (50.00)	<0.001
Price minimisation strategy			
Buy lower priced brands	106 (29.94)	97 (27.40)	0.241
Smoke less	106 (29.94)	93 (26.27)	0.118
Use loose tobacco/RYO	66 (18.64)	61 (17.23)	0.353
Buy smaller amounts	44 (12.43)	44 (12.43)	1.000
Buy unbranded tobacco	36 (10.17)	36 (10.17)	1.000
Buy in bulk	36 (10.17)	29 (8.19)	0.127
Smoke more of each cigarette	14 (3.95)	16 (4.52)	0.527
Unsure	31 (8.76)	28 (7.91)	0.578

^a Response options for hypothetical scenarios were not mutually exclusive.

^b The p-value reported refers to the Stuart-Maxwell test statistic from marginal homogeneity analysis.

Table 3. Comparison of response strategy among each of the hypothetical price increase scenarios based on level of financial stress (n = 354).

Strategy ^a	10% price rise			20% price rise		
	Low FS n(%)	High FS n(%)	Difference (χ^2) p-value	Low FS n(%)	High FS n(%)	Difference (χ^2) p-value
Make no change	37 (31)	59 (25)	0.291	24 (20)	37 (16)	0.350
Try to quit	51 (42)	90 (39)	0.521	61 (50)	116 (50)	0.911
Price-minimisation strategy						
Buy lower priced brands	29 (24)	77 (33)	0.077	25 (21)	72 (31)	0.040
Smoke less	35 (29)	71 (31)	0.763	27 (22)	66 (28)	0.223
Use loose tobacco/RYO	16 (13)	50 (22)	0.059	15 (12)	46 (20)	0.083
Buy smaller amounts	15 (12)	29 (13)	0.989	14 (12)	30 (13)	0.724
Buy unbranded tobacco	10 (8)	26 (11)	0.393	8 (7)	28 (12)	0.110
Buy in bulk	10 (8)	26 (11)	0.393	8 (7)	21 (9)	0.435
Smoke more of each cigarette	3 (3)	11 (5)	0.305	4 (3)	12 (5)	0.428
Unsure	4 (3)	27 (12)	0.009	5 (4)	23 (10)	0.058

^a Response options for hypothetical scenarios were not mutually exclusive.

Table 4. Factors associated with smokers selecting to ‘make no change’ in response to hypothetical price rise scenarios.

Characteristic	Bivariate analyses ^a			Logistic Regression (Final Model)			
	No Change N=99 (28%) n (%)	Change N=255 (72%) n (%)	χ^2 test p-value	Odds Ratio	95% CI	p-value	Likelihood Ratio Test ^b
Age			0.113				
18 – 39	51 (25)	155 (75)					
40+	48 (32)	100 (68)					
Gender			0.006				0.010
Male	50 (36)	88 (64)		ref	.	.	
Female	49 (23)	167 (77)		0.51	0.30 - 0.85	0.010	
Indigenous status			0.132				
Indigenous	13 (20)	51 (80)					
Non-Indigenous	86 (30)	204 (70)					
Marital Status			0.600				
Married/De facto	25 (29)	62 (71)					
Separated or divorced	25 (24)	78 (76)					
Never married /single/widow	49 (30)	115 (70)					
Education			0.035				0.022
Primary or High School 7-10	56 (25)	170 (75)		ref	.	.	
High School 11-12	14 (28)	37 (73)		1.40	0.66 – 2.96	0.382	
TAFE or Trade qualification	27 (42)	37 (58)		2.60	1.37 – 4.94	0.003	
University	2 (15)	11 (85)		0.59	0.12 – 2.88	0.516	
Income			0.249				
≤\$299	61 (31)	134 (69)					
≥\$300	34 (25)	103 (75)					
Prefer not to answer	4 (18)	18 (82)					
Housing			0.767				
Own house/private rental	33 (33)	75 (29)					
Government housing	49 (50)	135 (53)					

Homeless	17 (17)	45 (18)					
Financial stress			0.299				
Low	38 (38)	83 (33)					
High	61 (62)	172 (68)					
Heaviness of Smoking Index			0.001				0.007
Low	23 (23)	112 (44)		ref	.	.	
Moderate	49 (50)	104 (41)		2.52	1.30 – 4.88	0.006	
High	27 (27)	39 (15)		3.12	1.39 – 6.98	0.006	
Smoking-induced deprivation			0.120				
Yes	47 (48)	98 (38)					
No	52 (53)	157 (62)					
Weekly Tobacco Expenditure			0.006				0.002
≤\$24	13 (13)	50 (20)		ref	.	.	
\$25 - \$49	34 (34)	63 (25)		2.11	0.95 – 4.69	0.068	
\$50 - \$74	20 (20)	88 (35)		0.54	0.23 – 1.29	0.168	
≥\$75	32 (32)	54 (21)		1.21	0.51 – 2.90	0.664	
Ever made a quit attempt			0.634				
Yes	81 (82)	214 (84)					
No	18 (18)	41 (16)					
Quit attempts in past 12 mths			0.002				0.026
0	49 (50)	76 (30)		ref	.	.	
1	15 (15)	41 (16)		0.87	0.41 – 1.85	0.714	
2 – 4	28 (28)	92 (36)		0.59	0.32 – 1.07	0.080	
≥5	7 (7)	46 (18)		0.29	0.11 – 0.72	0.008	

^a Percentage totals may not add to 100 due to rounding

^b Results of the likelihood ratio test are presented for all variables entered into the initial logistic regression model.