

1 **Individual and interpersonal triggers to quit smoking in China: a cross-sectional analysis**

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1 **Abstract**

2 **Aims:** To determine the most prominent individual and interpersonal triggers to quit smoking in
3 China and their associations with socio-demographic characteristics.

4 **Methods:** Data come from Waves 1-3 (2006-2009) of the ITC China Survey, analysed cross-
5 sectionally as person-waves (N=14,358). Measures included socio-demographic and smoking
6 characteristics. Those who quit between waves (4.3%) were asked about triggers that “very much”
7 led them to stop smoking, and continuing smokers about triggers that “very much” made them think
8 about quitting. Triggers covered individual (personal health concerns, cigarette price, smoking
9 restrictions, advertisements, warning labels) and interpersonal factors (family/societal disapproval of
10 smoking, setting an example to children, concerns about second-hand smoke).

11 **Results:** Over a third of respondents (34.9%) endorsed at least one trigger strongly; quitters were
12 more likely than smokers to mention any trigger. While similar proportions of smokers endorsed
13 individual (24.4%) and interpersonal triggers (24.0%), quitters endorsed more individual (61.1%)
14 than interpersonal (48.3%) triggers. However, the most common triggers (‘personal health
15 concerns’; ‘setting an example to children’) were the same, endorsed by two-thirds of quitters and a
16 quarter of smokers, as were the least common triggers (‘warning labels’; ‘cigarette price’), endorsed
17 by one in ten quitters and one in twenty smokers. Lower dependence among smokers and greater
18 education among all respondents were associated with endorsing any trigger.

19 **Conclusions:** Individual rather than interpersonal triggers appear more important for quitters. Major
20 opportunities to motivate quit attempts are missed in China, particularly with regard to taxation and
21 risk communication. Interventions need to focus on more dependent and less-educated smokers.

22

1 INTRODUCTION

2 As the largest tobacco producer and consumer in the world, China has been severely hit by the
3 tobacco epidemic. Approximately 40% of the world's cigarettes are produced and one-third of the
4 world's cigarettes are consumed in China.[1] Chinese smokers constitute one-third of the world's
5 smoking population.[2] Smoking prevalence has remained high in China, with male smoking
6 prevalence standing at 52.9%.[3] As a consequence, 1.4 million deaths are attributable to tobacco in
7 China each year, and this is projected to rise to about 3 million deaths by 2050.[4]

8 Cultural and institutional barriers remain the major challenge in tobacco control faced by China,
9 where smoking has a positive social meaning and knowledge of smoking risks is poor among the
10 public.[5, 6] This is attributable to the weak support of tobacco control policies in China, a country
11 which has yet to meet the recommended WHO Framework Convention on Tobacco Control (FCTC)
12 guidelines. Although 13 cities revised or formulated local smoke-free regulations in accordance with
13 the FCTC Article 8 Guidelines, which were adopted in 2008, there is no national smoke-free law in
14 China which could avert 100,000 deaths attributed to secondhand smoking annually.[7] Poor
15 coverage of tobacco advertising bans leaves loopholes for tobacco advertising activities through
16 sponsorship, points of sale, and online advertising. Text-only health warning labels occupying only
17 30% of the display area of Chinese cigarettes packages are yet to meet the Article 11 Guidelines,
18 which were also adopted in 2008, which call for pictorial labels covering at least 50% of the display
19 area.[8] Moreover, an increase in excise tax on cigarettes at the producer level in 2009 in China has
20 had no effect on the retail price of cigarettes, thus failing to meet the Article 6 Guidelines, which
21 were adopted in 2014.[9, 10]

22 Identifying the most influential factors that motivate quit attempts among smokers and increase
23 abstinence in China could help to prioritise tobacco control efforts. While such factors can be
24 thought of as motives, reasons, or micro indicators of quitting [e.g. 11] and notwithstanding
25 considerable overlap in these concepts, we refer to these factors in this paper as "triggers," a term
26 that is in line with previous research [e.g. 12], given that we refer to factors that represent specific
27 concerns that are known to be related to quitting.

28 Data from high-income countries (HICs) such as the US, UK, France, Australia, and Canada suggest
29 that concern for personal health, setting an example for children, and cigarette price are among the
30 top three triggers to quit smoking.[7, 12-15] Learning about socio-demographic associations with
31 these factors may also be useful in identifying and tailoring effective tobacco control interventions
32 to particular socio-demographic groups. In terms of socio-demographic associations with triggers to
33 stop, anti-smoking advertisements appear to be most effective in younger smokers, future health
34 concerns are more likely to be cited by higher socio-economic status (SES) smokers, and cost is more
35 likely to be cited by lower SES smokers.[12] Further, younger smokers are more likely to consider
36 socialising as a motive to smoke while older smokers are more likely to consider personal enjoyment
37 as a main motive.[16]

38 Relatively little is known about the most important triggers prompting quit attempts and smoking
39 cessation in China. It would be inappropriate to generalize findings from HICs to China, an upper
40 middle-income country (UMIC) with a different cultural outlook and at a different stage in the
41 tobacco epidemic.[17] For instance, smokers from HICs have significantly greater knowledge of
42 smoking risks and greater intention to quit smoking than smokers in China.[18] Moreover, women

1 and older smokers are more supportive of public smoking bans in China, whereas women in HICs
2 tend to be less supportive of smoking bans in restaurants.[19, 20]

3 This paper, therefore, aims to identify the most prominent triggers to stop smoking among current
4 smokers and quitters in China. Comparing the relative importance of particular triggers as endorsed
5 by current smokers who have not succeeded in stopping and quitters who have been successful in
6 stopping may help to identify those factors that are most effective in motivating smoking cessation
7 and thus which interventions to prioritise in China. Moreover, identifying socio-demographic
8 differences in the motivational antecedents of stopping smoking can lead to evidence-based efforts
9 to develop more effective tailored tobacco control interventions. Given that China has a traditional
10 collectivist outlook, which places greater value on social acceptance compared with an individualist
11 outlook, which values personal success,[21] this paper also distinguishes between interpersonal,
12 socially-oriented triggers and personal, individually-oriented triggers. This will allow comparisons
13 between socialising factors and individual factors in terms of their influence on smoking cessation in
14 different socio-demographic groups.

15 In short, then, this study addressed the following research questions:

16 (1) What are the most prominent individual and interpersonal triggers to quit smoking reported by
17 quitters and smokers in China?

18 (2) Which, if any, socio-demographic characteristics are associated with these triggers?

19 **METHODS**

20 **Study Design and Sample**

21 The ITC Project has conducted longitudinal cohort surveys in 22 countries to examine the factors
22 that are associated with tobacco use and cessation. One important objective of the ITC Project is to
23 assess the psychosocial and behavioural impact of WHO FCTC policies.

24 Data come from the ITC China Surveys, which were conducted by researchers from local and central
25 offices of the Tobacco Control Office, Chinese Center for Disease Control and Prevention, and an
26 international team of researchers of the ITC Project, centered at the University of Waterloo. Four
27 waves of the ITC China Survey were conducted in 6 cities in Mainland China which were selected due
28 to their differences in size, location, and economic development: Beijing, Changsha, Guangzhou,
29 Shanghai, Shenyang, and Yinchuan.

30 Details of the sampling method and design for the ITC China Survey are presented elsewhere.[22]
31 Briefly, respondents were selected using a multistage cluster sampling design to ensure a
32 representative sample of adult smokers and non-smokers in each city. Smokers were defined as
33 those who had smoked at least 100 cigarettes in their lifetime, currently smoking at least once a
34 week. The demographic characteristics, smoking and smoking-related behaviours, policy-relevant
35 measures related to FCTC domains and psychosocial precursors to smoking and cessation of each
36 respondent were collected using standardised questionnaires through face-to-face interviews.

37 In each city, a random sample of approximately 800 adult smokers and 200 adult non-smokers were
38 surveyed. At Waves 2 and 3, the cohort was replenished to maintain the sample size by recruiting

1 new respondents from the same sampling frame. Due to the longitudinal design of the survey, a
2 sample of ex-smokers (quitters) who had been smokers at recruitment was identified; these quitters
3 still participated in the survey, answering questions which reflected the fact that they had quit
4 smoking. The analyses reported in this paper were conducted on data from smokers and quitters
5 surveyed in Waves 1 through 3 (data of Wave 4 were not yet available), excluding respondents
6 recruited as non-smokers.

7 The sample sizes were: Wave 1 (conducted April–August 2006)=4,732 smokers; Wave 2 (October
8 2007–January 2008)=3,709 smokers, 217 quitters, and 917 newly recruited smokers (retention rate
9 83%); Wave 3 (May to October 2009)=3,549 smokers, 374 quitters, and 860 newly recruited smokers
10 (retention rate 81%). The data set analyzed for this paper was a sample of 14,358 person-waves
11 (with each respondent contributing responses from one, two, or three survey waves).

12 Ethics approval was obtained from research ethics boards or institutional review boards at the
13 University of Waterloo (Waterloo, Canada), Roswell Park Cancer Institute (Buffalo, USA), The Cancer
14 Council Victoria (Melbourne, Australia), and the Chinese Center for Disease Control and Prevention
15 (Beijing, China).

16 **Measures**

17 Outcome Variables

18 All smokers and quitters answered a multi-part question. For smokers the question was: “In the past
19 6 months, have each of the following things led you to think about quitting?”; for quitters the
20 question was: “Which of the following things led you to quit?”. There were nine items in the list
21 which followed, and these were divided into two different types of variables:

22 *Interpersonal variables* were: (a) concern about the effect of secondhand smoke on non-smokers, (b)
23 disapproval of smoking in Chinese society, (c) setting an example for children, and (d) disapproval of
24 smoking in the family.

25 *Individual variables* were: (a) the price of cigarettes, (b) smoking restrictions in public and work
26 places, (c) advertisements or information about the health risks of smoking, (d) health warning labels
27 on cigarette packages, and (e) concern for personal health.

28 The variables were dichotomised based on the response to the question, coded ‘yes’ if the smoker
29 or quitter agreed that the particular variable had led them to think about quitting (or had led them
30 to quit) “Very Much”, and coded ‘no’ for all other responses (i.e., “Not at all”, “Somewhat”,
31 “Refused” or “Don’t know”).

32 Covariates

33 Socio-demographic covariates included age, gender, household income, marital status, education
34 and ethnicity. Based on the cut-offs for urban areas from the 2010 China Statistics Yearbook,[23]
35 monthly household income was classified into three groups: low (<¥1,000), medium (¥1,000-3,000)
36 and high (>¥3,000). Education was classified into low (less than high school), medium (high school),
37 and high (more than high school). Ethnicity was classified into Han Chinese and non-Han Chinese.

1 Lastly, nicotine dependence (heaviness of smoking index [24]) and city were also included as
 2 covariates in analysis.

3 Analysis

4 Data were analysed using SPSS v.20. The analysis was carried out at the level of person-waves, and
 5 thus, generalised estimating equation (GEE) models with a logit link function, specifying an
 6 unstructured correlation matrix, were conducted to account for the correlated observations. Given
 7 the specific survey design, weighted logistic regressions, using complex samples analysis, were used
 8 to obtain confidence intervals, and significance values for the point estimates were derived from
 9 GEE to assess associations between predictor and outcome variables, controlling for all other
 10 variables and covariates. Because of the large number of associations to be tested, the Benjamini-
 11 Hochberg-procedure [25] was used to adjust the significance level for multiple comparisons.

12 RESULTS

13 As shown in Table 1, the sample was mainly male, Han Chinese, married, and with at least high
 14 school education, and medium-level income. Most smokers reported a moderate level of
 15 dependence. Across waves, relatively few smokers had stopped since recruitment (4.3%, 95%CI 3.4-
 16 5.3) and there were only a few differences between quitters and smokers: quitters were somewhat
 17 more affluent and less dependent than smokers (Table 1).

18 **Table 1:** Sample covariates (socio-demographic and smoking characteristics) by smoking status[^]

	Total sample (N=14,358)	Current Smokers (N=13,767)	Quitters (N=591)	P
<i>Covariates</i>				
Mean (SEM) Age	50.7 (0.57)	50.6 (0.39)	50.7 (0.93)	0.937
% (N) Men	95.2 (13,596)	95.2 (13,048)	95.2 (548)	0.997
% (N) Monthly household Income				<0.001
High (>¥3,000)	36.3 (4,996)	35.8 (4,733)	47.3 (263)	
Medium (¥1,000-3,000)	46.7 (6,211)	47.1 (5,975)	40.7 (236)	
Low (<¥1,000)	16.8 (2,201)	17.0 (2,132)	11.8 (69)	
% (N) Married/Cohabiting	89.3 (12,833)	88.2 (12,281)	90.3 (552)	0.313
% (N) Education				0.709
Above high school	20.3 (3,068)	20.3 (2,934)	19.7 (134)	
High School	66.0 (9,442)	66.0 (9,103)	60.8 (339)	
Less than high school	13.7 (1,800)	13.6 (1,685)	18.5 (115)	
% (N) Han Chinese	94.3 (13,467)	94.3 (12,921)	94.3 (546)	0.993
% (N) City				0.966
Beijing	14.6 (2,388)	14.2 (2,284)	19.2 (104)	
Shenyang	20.3 (2,368)	20.4 (2,309)	10.6 (59)	
Shanghai	14.0 (2,371)	14.0 (2,301)	12.1 (70)	
Changsha	15.2 (2,367)	15.2 (2,261)	13.8 (106)	
Guangzhou	18.1 (2,453)	18.1 (2,341)	19.2 (112)	
Yinchuan	17.7 (2,411)	17.7 (2,271)	24.5 (140)	
Mean (SEM) HSI	2.29 (0.06)	2.42 (0.04)	2.16 (0.11)	0.022

1 **The most prevalent individual and interpersonal triggers to quit smoking reported by quitters and**
2 **current smokers**

3 Overall, slightly more than one-third of respondents (34.9%, 95%CI 32.6-37.3) endorsed at least one
4 trigger 'very much' (and 78.2%, 95%CI 76.3-80.1, endorsed one trigger or more at least 'somewhat').
5 Similar proportions of respondents 'very much' endorsed individual factors (26.1%, 95%CI 24.3-27.8)
6 and interpersonal factors (25.0%, 95%CI 23.1-27.0). As shown in Figure 1, quitters were more likely
7 than smokers to endorse any of the triggers, after adjusting for socio-demographic and covariate
8 characteristics (Adjusted odds ratio (AOR) 4.89, 95%CI 3.72-6.43). While over two-thirds of quitters
9 had endorsed at least one trigger (71.3%, 95%CI 65.8-76.8), only one-third of smokers had done so
10 (33.3%, 95%CI 31.1-35.4). This difference was much more pronounced for individual triggers,
11 endorsed by 61.1% (95%CI 57.0-65.2) of quitters and 24.4% (95%CI 22.8-26.0) of smokers (AOR 4.55,
12 95%CI 3.60-6.70), than it was for interpersonal triggers, endorsed by 48.3% (95%CI 42.4-54.2) of
13 quitters and 24.0% (95%CI 22.2-25.8) of smokers (AOR 3.07, 95%CI 2.29-4.12).

14 *Insert Figure 1 here*

15 This was mainly due to the disparate endorsement of health concerns by the two groups which was
16 far more prevalent among quitters than smokers (Figure 1). However, the overall rank order of
17 triggers was very similar for both smokers and quitters. Overall, one in five respondents mentioned
18 health concerns as a trigger for quitting or attempting to quit, followed by concerns for children and
19 concerns about the impact of secondhand smoke on non-smokers, mentioned by at least 15% of the
20 total sample. The most uncommon triggers—information about health risks, the price of cigarettes
21 and warning labels—were mentioned by less than one in 20 respondents.

22 **Socio-demographic characteristics associated with individual and interpersonal triggers to quit**
23 **smoking**

24 Higher education (AOR 1.15, 95%CI 1.06-1.26) and lower dependence (AOR 0.88, 95%CI 0.85-0.91)
25 were the significant predictors of endorsing any triggers among smokers, and higher education (AOR
26 1.60, 95%CI 1.01-2.55) the only significant predictor among quitters, controlling for all other
27 variables. In addition, smokers from Beijing were more likely to endorse any trigger than smokers
28 from Changsha (AOR 0.68, 95%CI 0.52-0.90) and Shanghai (AOR 0.54, 95%CI 0.42-0.69) but smokers
29 from Yinchuan (AOR 1.39, 95%CI 1.14-1.70) were more likely to endorse triggers than those from
30 Beijing. Similarly, quitters from Changsha (AOR 0.33, 95%CI 0.14-0.75) and Shanghai (AOR 0.39,
31 95%CI 0.18-0.85) were less likely to endorse any trigger than quitters from Beijing.

32 When considering associations with endorsement of at least one individual and one interpersonal
33 triggers separately, there were some differences for smokers and quitters. Among quitters, there
34 were no consistent, significant associations with individual triggers and for interpersonal triggers,
35 only geographic associations emerged: quitters from Shanghai (AOR 0.32, 95%CI 0.13-0.81) and
36 Changsha (AOR 0.21, 95%CI 0.11-0.42) were less likely to endorse any interpersonal triggers than
37 quitters from Beijing. This lack of significance of associations may also reflect relatively low power to
38 detect such effects.

39 Among smokers, there were consistent associations of endorsement of individual and interpersonal
40 triggers with both higher education (AOR 1.13, 95%CI 1.01-1.25 and AOR 1.20, 95%CI 1.08-1.32,

1 respectively) and lower dependence (AOR 0.89, 95%CI 0.85-0.93 and AOR 0.85, 95%CI 0.81-0.89,
2 respectively). As for quitters, there were some geographic associations. Smokers from Shanghai
3 were less (AOR 0.58, 95%CI 0.44-0.78) and smokers from Yinchuan more likely (AOR 1.40, 95%CI
4 1.13-1.74) than smokers from Beijing to endorse any individual triggers. Similarly, smokers from
5 Shanghai (AOR 0.53, 95%CI 0.41-0.69) or Changsha (AOR 0.58, 95%CI 0.43-0.78) were less likely than
6 smokers from Beijing to endorse any interpersonal triggers. However, smokers from Shenyang (AOR
7 1.43, 95%CI 1.05-1.95) or Yinchuan (AOR 1.41, 95%CI 1.14-1.75) were more likely than smokers
8 from Beijing to endorse at least one interpersonal trigger.

9 Tables 2 and 3 provide a breakdown of associations with specific individual and interpersonal
10 triggers, respectively. In addition to the above observed predictors of endorsing at least one
11 individual or interpersonal trigger, the results show that male quitters were less likely than female
12 quitters to mention smoking restrictions in public or work places as a factor in stopping smoking, and
13 lower income was associated with greater likelihood of mentioning price of cigarettes as a trigger to
14 stop in smokers (Table 2). Married/cohabiting smokers were more likely than those who were not to
15 cite setting an example to children as a trigger to stop as were younger smokers; older smokers were
16 more likely to endorse societal disapproval as factor in stopping smoking (Table 3).

1 **Table 2:** Multivariable associations of covariates with individual triggers to stop smoking in current smokers and quitters

	Concern for personal health		Smoking restrictions in public and work places		Health risk information / advertisements		Price of cigarettes		Health warning labels on cigarette packages	
	Smoker	Quitter	Smoker	Quitter	Smoker	Quitter	Smoker	Quitter	Smoker	Quitter
<i>Covariates</i>	Adjusted Odds Ratios~ (95 % Confidence Interval)									
Age	1.01 (1.00-1.01)	1.01 (1.00-1.03)	1.01 (1.00-1.01)	1.00 (0.97-1.02)	1.01 (1.00-1.02)	1.00 (0.97-1.03)	1.00 (0.99-1.01)	0.98 (0.94-1.02)	1.01 (1.00-1.02)	0.96 (0.94-0.99)
Men	0.89 (0.65-1.22)	0.63 (0.34-1.18)	1.03 (0.74-1.42)	0.24 (0.10-0.53)	0.99 (0.54-1.81)	0.44 (0.14-1.36)	0.84 (0.49-1.44)	1.18 (0.25-5.64)	0.67 (0.37-1.23)	0.88 (0.35-2.20)
Household Income^	1.04 (0.94-1.15)	0.67 (0.46-0.98)	0.93 (0.79-1.10)	0.55 (0.30-1.03)	0.91 (0.75-1.09)	0.94 (0.42-2.09)	0.47 (0.38-0.60)	0.32 (0.13-0.82)	0.83 (0.65-1.08)	0.88 (0.51-1.52)
Married/Cohabiting	1.04 (0.84-1.28)	1.00 (0.39-2.58)	1.02 (0.77-1.36)	2.59 (0.58-11.56)	1.08 (0.75-1.55)	5.51 (0.87-34.93)	0.70 (0.49-1.01)	0.96 (0.14-6.62)	1.03 (0.65-1.63)	3.25 (0.30-34.77)
Education^	1.18 (1.04-1.35)	1.51 (0.98-2.30)	1.17 (1.03-1.33)	1.95 (1.05-3.64)	1.05 (0.86-1.28)	1.23 (0.47-3.22)	0.93 (0.75-1.17)	1.18 (0.47-3.00)	1.03 (0.84-1.26)	1.03 (0.52-2.03)
Han Chinese	0.87 (0.66-1.14)	1.66 (0.87-3.16)	0.87 (0.64-1.18)	0.91 (0.31-2.69)	1.00 (0.64-1.56)	1.14 (0.26-4.90)	0.82 (0.39-1.70)	0.66 (0.12-3.71)	1.06 (0.53-2.14)	2.38 (0.56-10.19)
Beijing	1	1	1	1	1	1	1	1	1	1
Shenyang	1.34 (0.97-1.85)	1.57 (0.95-2.60)	1.31 (0.92-1.85)	1.82 (0.62-5.39)	1.73 (1.13-2.63)	0.78 (0.29-2.07)	1.78 (0.95-3.31)	2.64 (0.94-7.40)	1.22 (0.75-1.99)	2.91 (0.57-14.92)
Shanghai	0.64 (0.46-0.90)	0.89 (0.50-1.59)	0.58 (0.39-0.87)	0.09 (0.02-0.43)	0.58 (0.34-0.96)	0.59 (0.16-2.23)	1.24 (0.58-2.63)	0.35 (0.11-1.07)	0.41 (0.18-0.92)	1.20 (0.15-9.38)
Changsha	0.87 (0.59-1.29)	0.77 (0.42-1.39)	0.53 (0.35-0.79)	0.53 (0.22-1.28)	0.35 (0.20-0.62)	0.31 (0.14-0.70)	1.33 (0.69-2.53)	0.85 (0.29-2.48)	0.33 (0.18-0.61)	0.62 (0.11-3.53)
Guangzhou	0.96 (0.75-1.23)	0.72 (0.36-1.46)	0.72 (0.43-1.21)	0.40 (0.11-1.38)	0.59 (0.35-0.99)	0.23 (0.05-1.05)	1.90 (0.92-3.94)	2.41 (0.59-9.96)	0.38 (0.20-0.73)	0.99 (0.17-5.65)
Yinchuan	1.92 (1.55-2.36)	0.89 (0.48-1.66)	0.91 (0.63-1.31)	0.58 (0.23-1.46)	1.11 (0.72-1.70)	0.20 (0.06-0.63)	2.24 (1.22-4.09)	0.31 (0.07-1.31)	1.19 (0.77-1.83)	0.77 (0.15-3.92)
HSI	0.91 (0.87-0.94)	1.01 (0.91-1.12)	0.87 (0.81-0.94)	0.79 (0.66-0.95)	0.85 (0.78-0.93)	0.67 (0.52-0.87)	0.95 (0.87-1.04)	0.94 (0.64-1.39)	0.84 (0.77-0.92)	0.81 (0.69-0.96)

1 **Table 3:** Multivariable associations of covariates with interpersonal triggers to stop smoking in current smokers and quitters

	Setting an example for children		Concern about secondhand smoke effect		Disapproval of smoking in family		Disapproval of smoking in Chinese society	
	Smoker	Quitter	Smoker	Quitter	Smoker	Quitter	Smoker	Quitter
<i>Covariates</i>	Adjusted Odds Ratios~ (95 % Confidence Interval)							
Age	0.99 (0.98-1.00)	0.99 (0.97-1.02)	1.00 (0.99-1.01)	0.98 (0.96-1.00)	1.00 (1.00-1.01)	0.98 (0.96-1.00)	1.02 (1.01-1.02)	0.96 (0.92-1.00)
Men	0.74 (0.53-1.03)	0.53 (0.18-1.55)	1.00 (0.69-1.46)	0.46 (0.17-1.23)	1.08 (0.69-1.69)	1.45 (0.32-6.54)	1.22 (0.74-2.01)	0.59 (0.27-1.28)
Household Income^	1.07 (0.97-1.19)	1.33 (0.99-1.78)	1.07 (0.97-1.19)	1.28 (0.87-1.89)	1.03 (0.91-1.17)	0.99 (0.72-1.36)	0.99 (0.84-1.17)	0.72 (0.42-1.22)
Married/ Cohabiting	1.43 (1.08-1.88)	3.87 (0.49-30.62)	1.21 (0.92-1.59)	1.29 (0.40-4.24)	1.19 (0.91-1.56)	2.42 (0.49-11.84)	0.86 (0.62-1.18)	1.65 (0.32-8.62)
Education^	1.14 (1.02-1.27)	1.52 (1.10-2.11)	1.12 (0.97-1.30)	0.90 (0.60-1.35)	1.21 (1.06-1.38)	1.12 (0.76-1.65)	1.05 (0.91-1.22)	0.72 (0.32-1.63)
Han Chinese	0.86 (0.66-1.11)	0.99 (0.42-2.33)	0.97 (0.68-1.36)	2.08 (0.72-6.00)	0.88 (0.67-1.16)	0.87 (0.37-2.06)	0.95 (0.62-1.45)	2.04 (0.55-7.56)
Beijing	1	1	1	1	1	1	1	1
Shenyang	1.76 (1.22-2.53)	0.64 (0.23-1.75)	1.19 (0.91-1.56)	0.91 (0.32-2.53)	1.44 (1.03-2.03)	0.98 (0.41-2.31)	1.48 (1.02-2.15)	4.02 (0.64-25.17)
Shanghai	0.52 (0.39-0.71)	0.21 (0.07-0.61)	0.53 (0.39-0.70)	0.48 (0.26-0.90)	0.41 (0.30-0.57)	0.33 (0.11-1.06)	0.69 (0.37-1.30)	1.09 (0.15-8.12)
Changsha	0.57 (0.39-0.82)	0.26 (0.11-0.63)	0.52 (0.38-0.70)	0.19 (0.12-0.31)	0.46 (0.31-0.69)	0.39 (0.21-0.71)	0.47 (0.29-0.79)	0.63 (0.10-4.16)
Guangzhou	0.97 (0.66-1.42)	0.37 (0.12-1.17)	0.73 (0.53-1.00)	0.28 (0.12-0.63)	0.83 (0.59-1.17)	0.91 (0.41-2.04)	0.70 (0.40-1.22)	0.57 (0.08-3.95)
Yinchuan	1.35 (1.02-1.79)	0.29 (0.09-0.87)	1.59 (1.30-1.94)	0.67 (0.42-1.06)	1.26 (0.93-1.70)	0.48 (0.27-0.87)	1.81 (1.26-2.59)	1.60 (0.28-9.32)
HSI	0.83 (0.78-0.87)	0.91 (0.76-1.09)	0.85 (0.81-0.89)	0.93 (0.81-1.07)	0.85 (0.81-0.90)	0.99 (0.83-1.18)	0.88 (0.82-0.94)	0.88 (0.71-1.08)

2

1 DISCUSSION

2 Overall, one-third of quitters or current smokers in China endorsed at least one prominent trigger to
3 quit smoking 'very much'. However, quitters were much more likely than smokers to endorse any of
4 the triggers, in particular individual as compared with interpersonal triggers. Nonetheless, the order
5 of importance of triggers was relatively similar in both groups.

6 As is the case in HICs such as the US, the UK, and France, concerns for personal health was the most
7 commonly cited trigger.[12, 14, 15] However, unlike in these countries where the price of cigarettes
8 is often mentioned as a main reason for stopping smoking,[14, 15, 26, 27] price was among the least
9 important triggers to quit smoking in China. ITC studies have shown that cigarettes are highly
10 affordable in China compared with other countries and that affordability is increasing.[28] Chinese
11 smokers engage in cost/price-reducing purchase behaviours such as choosing a cheaper cigarette
12 brand in the lower income group and buying in cartons in the higher income group rather than
13 quitting.[29] Health warnings, commonly mentioned as a trigger to quitting,[30, 31] were rarely
14 mentioned by Chinese smokers or quitters, possibly in part due to the non-specific, small, text-only
15 health warnings in China.[8, 32] In addition, few respondents mentioned that receiving health risk
16 information had triggered a quit attempt, consistent with the low level of information campaigns in
17 China on the harms of smoking.[33] Moreover, while advice from health professionals is a commonly
18 cited reason for unplanned quit attempts in HICs,[34] compared with other countries a relatively big
19 number of medical professionals in China are smokers,[35] who may be more resistant to provide
20 stop advice.

21 Given the relative importance of traditional family values and the Chinese perception of cigarettes as
22 a social connection builder,[36, 37] some of these disparities may arise from cultural differences.
23 Chinese smokers residing within a largely collectivist society may have different attitudes than
24 smokers from HICs, as social disapproval of smoking is a more significant predictor of regret of
25 smoking in Asian countries than in Western HICs.[38] Interestingly, however, in China, as elsewhere,
26 individual factors seemed to be more important than interpersonal factors for smoking cessation.
27 Individual triggers were endorsed more than interpersonal triggers among those who had
28 successfully quit. The fact that interpersonal factors such as societal disapproval did not feature
29 highly among triggers to stop smoking may reflect the tobacco-friendly atmosphere in Chinese
30 society, where societal pressures are supportive of, rather than detrimental to, smoking. This, of
31 course, is not immutable and it is interesting to note that some consistent geographic associations
32 were observed for both individual and interpersonal triggers to stop. These associations largely map
33 on to local smoke-free policy, i.e. smokers from cities with weaker policies at the time of the survey
34 (Shanghai, Changsha) were generally less likely to endorse triggers than smokers from cities where
35 smoking bans (Beijing, Shenyang, Yinchuan), had been implemented.

36 Across waves, the quit rate was low with few socio-demographic differences between smokers and
37 quitters. The only factor associated with stopping smoking successfully was income: quitters tended
38 to be more affluent, which is consistent with findings in HICs which show that higher-SES smokers
39 are more likely to quit successfully.[39] In addition, smokers and quitters with higher education and
40 smokers with lower dependence were generally more likely to endorse triggers. This finding is in
41 agreement with studies from other countries which show that people with higher education
42 background have a lower probability of relapse,[40] smokers with lower nicotine dependence are

1 more successful in staying abstinent,[41, 42] and smokers with lower education background have
2 higher nicotine dependence and lower intention to quit smoking.[43]

3 Our results have a number of implications. Firstly, the findings suggest the need to focus tobacco
4 control interventions on less educated but more nicotine dependent smokers, who may be
5 especially susceptible to misperceptions about smoking. [44] This could be done by tailoring health
6 messages to be as simple and comprehensible as possible to overcome such misleading myths.[6]

7 Secondly, though the current Chinese government has prohibited Chinese officials from exchanging
8 cigarettes as gifts,[45] the findings demonstrate the need for further education campaigns to dispel
9 the general, long-standing positive perception held by the Chinese population towards smoking as
10 indicated by the low levels of perceived societal disapproval of smoking.[46] As has been done in
11 other public health campaigns [e.g. 47], one way to influence the public attitude towards smoking
12 could be to utilise famous, respected Chinese public figures such as the First Lady of China, Peng
13 Liyuan, and the basketball star, Yao Ming, to promote anti-smoking messages.[48, 49]. Traditional
14 family values can also be a potential tool in tobacco control. Although there may be a danger that
15 children may rebel against parents, as Chinese teenagers are taught to listen to their parents and
16 elders in order to show respect and maintain family harmony, parents, and grandparents can be a
17 powerful and effective medium to transmit anti-smoking messages by expressing disapproval of
18 smoking to their children. [37] This should, however, be combined with encouraging parents to stop
19 smoking by emphasising the need to set an example for children in the family. Health education
20 campaigns should be designed to convey a message of family disapproval of smoking as well as
21 setting an example for children, consistent with the finding that this was among the commonly cited
22 triggers.

23 Thirdly, this study demonstrates that important opportunities – in particular regarding cigarette
24 price and graphic warning labels – may be being missed in China. Cost is a major factor in smoking
25 cessation globally and warning labels have been shown to increase knowledge and quit attempts at
26 no cost.[16, 27] Even though cigarettes are highly affordable in China, the fact that price was a
27 trigger to consider stopping among the less affluent smokers in this study suggests that raising the
28 tax on tobacco products at the retail end instead of the producer end could be effective, especially
29 for low-income smokers.[50] In addition, using effective risk communication is important, e.g. by
30 imposing graphic warning labels, which are easier to understand for less educated smokers, with at
31 least 50% at the top of the front and back of cigarette packages as recommended by the FCTC Article
32 11 Guidelines,. The observation that local changes in tobacco control policy are associated with
33 greater endorsement of triggers to stop also underscores the real effect that these changes can have
34 on attitudes towards smoking. Indeed, implementing FCTC guidelines, in particular price and tax
35 measures (Article 6) and education, communication, training, and public awareness (Article 12), has
36 been estimated to potentially reduce smoking prevalence by up to 41% by 2050, saving millions of
37 lives in China.[51]

38 This study has a number of limitations. Although the observational nature of the study precludes any
39 causal interpretation, the main purpose of the paper was descriptive and likely confounders were
40 controlled for in analysis. The best way to assess any causal associations between triggers and
41 behaviour is in an experimental design. The assessment of triggers to quit among ex-smokers was
42 retrospective and ideally this would be assessed in real time, e.g. using ecological momentary

1 assessment. However, this would not have been practical given the sample size, and it is difficult to
2 see how the retrospective analysis would have introduced biases compared with other similar
3 studies on triggers. While there was no biochemical verification of smoking status, self-report is
4 common practice and largely reliable.[52] Lastly, though the sample used in the study was not a truly
5 national sample, the selected cities covered a geographically wide and diverse area of China. Within
6 the chosen cities, weights were used to ensure representativeness.

7 In conclusion, this study is among the first to consider explicitly not only the relative importance of
8 different triggers to stop on smoking behaviour but also the impact of socio-demographic
9 characteristics on quitting attitude and triggers to stop in China. This paper highlights the need to
10 target tobacco control interventions at the less educated and more nicotine dependent smokers in
11 China by working on health education, tobacco tax, and warning labels on cigarette packages.[8, 9]
12 More generally, in addition to maximising the effectiveness of tobacco control interventions by
13 targeting particular audience groups, these results underline the urgent need to implement FCTC
14 guidelines in order to reduce smoking prevalence, regardless of socio-demographic characteristics,
15 to provide sufficient help and information to encourage smoking cessation. Given the low
16 endorsement of triggers among smokers in China, there is scope for future research to investigate if
17 there are other main triggers specific to this country.

18

1 **What this paper adds**

2 > This is the first study to identify individual and interpersonal triggers and compare their relative
3 importance for stopping smoking in a Chinese sample of adult urban smokers and recent quitters.

4 > Individual rather than interpersonal triggers are more important for quitters but not smokers.
5 Similar to Western samples, “personal health concerns” is the most commonly cited trigger to quit in
6 the Chinese population; however, in contrast to high income countries, the price of cigarettes and
7 health risk information are not important triggers for quitting smoking.

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10 **Contributions**

11 PKI, MET, GTF, and LS designed the study; GTF and YJ collected data; PKI and LS conducted data
12 analysis; AM, MET, GTF contributed to data interpretation; PKI wrote the first draft; AM, MET, GTF,
13 SX, ACKQ, and LS revised the draft; The final version of this paper has been reviewed and approved
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23 report, or in the decision to submit the paper for publication.

24 **Competing Interests**

25 LS reports personal fees from pharmaceutical companies that make smoking cessation products,
26 outside the submitted work. The other authors have no competing interest to declare.

27 **Patient consent**

28 Obtained

29 **Ethics approval**

30 Ethics approval was obtained from research ethics board or institutional review board at the
31 University of Waterloo (Waterloo, Canada), Roswell Park Cancer Institute (Buffalo, USA), The Cancer
32 Council Victoria (Melbourne, Australia), and the Chinese Center for Disease Control and Prevention
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1 References

- 2 1. Li C. *The Political Mapping of China's Tobacco Industry and Anti-Smoking Campaign*.
3 Washington, D.C.: The Brookings Institution; 2012.
- 4 2. Yang G, Kong L, Zhao W, Wan X, Zhai Y, Chen LC, *et al*. Emergence of chronic non-
5 communicable diseases in China. *Lancet* 2008; 372(9650):1697-1705.
- 6 3. Li Q, Hsia J, Yang G. Prevalence of smoking in China in 2010. *N Engl J Med* 2011;
7 364(25):2469-2470.
- 8 4. Yang G, Wang Y, Wu Y, Yang J, Wan X. The road to effective tobacco control in China. *Lancet*
9 2015; 385(9972):1019-1028.
- 10 5. Gilman S, Zhou X. *Smoke: A global history of smoking*. London: Reaktion Books; 2004.
- 11 6. Chinese Association on Tobacco Control. The harms of tobacco: Science and Myths. In:
12 2010.
- 13 7. ITC Project and Office of Tobacco Control - China CDC. ITC China Project Report. Findings
14 from Wave 1 to 3 Surveys (2006-2009). In. Beijing: China Modern Economic
15 Publishing House; 2012.
- 16 8. World Health Organization Western Pacific Region and University of Waterloo - ITC Project
17 and ThinkTank Research Center for Health Development. Tobacco health warnings in
18 China: evidence of effectiveness and implications for action. In. Manila: World
19 Health Organization Regional Office for the Western Pacific; 2014.
- 20 9. Gao S, Zheng R, Hu TW. Can increases in the cigarette tax rate be linked to cigarette retail
21 prices? Solving mysteries related to the cigarette pricing mechanism in China. *Tob*
22 *Control* 2012; 21(6):560-562.
- 23 10. Li Q, Hu TW, Mao Z, O'Connor RJ, Fong GT, Wu C, *et al*. When a tax increase fails as a
24 tobacco control policy: the ITC China project evaluation of the 2009 cigarette tax
25 increase in China. *Tob Control* 2012; 21(3):381.
- 26 11. Partos TR, Borland R, Thrasher JF, Li L, Yong HH, O'Connor RJ, *et al*. The predictive utility of
27 micro indicators of concern about smoking: findings from the International Tobacco
28 Control Four Country study. *Addict Behav* 2014; 39(8):1235-1242.
- 29 12. Vangeli E, West R. Sociodemographic differences in triggers to quit smoking: findings from a
30 national survey. *Tob Control* 2008; 17(6):410-415.
- 31 13. Hammond D, Fong GT, McNeill A, Borland R, Cummings KM. Effectiveness of cigarette
32 warning labels in informing smokers about the risks of smoking: findings from the
33 International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006; 15 Suppl
34 3:iii19-iii25.
- 35 14. Baha M, Le Faou AL. Smokers' reasons for quitting in an anti-smoking social context. *Public*
36 *Health* 2010; 124(4):225-231.

- 1 15. International Tobacco Control Policy Evaluation Project. ITC United States National Report:
2 Findings from the Wave 1 to 8 Surveys (2002-2011). In: University of Waterloo,
3 Waterloo, Ontario, Canada and Medical University of South Carolina, Charleston,
4 South Carolina, United States.; 2014.
- 5 16. Fidler JA, West R. Self-perceived smoking motives and their correlates in a general
6 population sample. *Nicotine Tob Res* 2009; 11(10):1182-1188.
- 7 17. Lopez A, Collishaw N, Piha T. A descriptive model of the cigarette epidemic in developed
8 countries. *Tob Control* 1994; 3:242-247.
- 9 18. Yang J, Hammond D, Driezen P, Fong GT, Jiang Y. Health knowledge and perception of risks
10 among Chinese smokers and non-smokers: findings from the Wave 1 ITC China
11 Survey. *Tob Control* 2010; 19 Suppl 2:i18-i23.
- 12 19. Borland R, Yong HH, Siahpush M, Hyland A, Campbell S, Hastings G, *et al.* Support for and
13 reported compliance with smoke-free restaurants and bars by smokers in four
14 countries: findings from the International Tobacco Control (ITC) Four Country
15 Survey. *Tob Control* 2006; 15 Suppl 3:iii34-iii41.
- 16 20. Li Q, Hyland A, O'Connor R, Zhao G, Du L, Li X, *et al.* Support for smoke-free policies among
17 smokers and non-smokers in six cities in China: ITC China Survey. *Tob Control* 2010;
18 19 Suppl 2:i40-i46.
- 19 21. Oyserman D, Coon HM, Kimmelmeier M. Rethinking individualism and collectivism:
20 evaluation of theoretical assumptions and meta-analyses. *Psychol Bull* 2002;
21 128(1):3-72.
- 22 22. Wu C, Thompson ME, Fong GT, Jiang Y, Yang Y, Feng G, *et al.* Methods of the International
23 Tobacco Control (ITC) China Survey: waves 1, 2 and 3. *Tob Control* 2014.
- 24 23. National Bureau of Statistics of China. *China Statistical Yearbook*. Beijing: China Statistics
25 Press / Beijing Info Press; 2010.
- 26 24. Heatherton TF, Kozlowski LT, Frecker RC, Rickert W, Robinson J. Measuring the heaviness of
27 smoking: using self-reported time to the first cigarette of the day and number of
28 cigarettes smoked per day. *Br J Addict* 1989; 84(7):791-799.
- 29 25. Benjamini Y, Hochberg Y. Controlling the False Discovery Rate - A Practical and Powerful
30 Approach to Multiple Testing. *J R Statist Soc, B* 1995; 57(1):289-300.
- 31 26. Gruber J, Sen A, Stabile M. Estimating price elasticities when there is smuggling: the
32 sensitivity of smoking to price in Canada. *J Health Econ* 2003; 22(5):821-842.
- 33 27. Ranson MK, Jha P, Chaloupka FJ, Nguyen SN. Global and regional estimates of the
34 effectiveness and cost-effectiveness of price increases and other tobacco control
35 policies. *Nicotine Tob Res* 2002; 4(3):311-319.
- 36 28. ITC Project. *Tobacco price and taxation: ITC cross-country comparison report*. Waterloo,
37 Ontario, Canada: University of Waterloo; 2014.

- 1 29. Huang J, Zheng R, Chaloupka FJ, Fong GT, Li Q, Jiang Y. Chinese smokers' cigarette purchase
2 behaviours, cigarette prices and consumption: findings from the ITC China Survey.
3 *Tob Control* 2014; 23 Suppl 1:i67-i72.
- 4 30. Hammond D, Fong GT, McDonald PW, Cameron R, Brown KS. Impact of the graphic Canadian
5 warning labels on adult smoking behaviour. *Tob Control* 2003; 12(4):391-395.
- 6 31. White V, Webster B, Wakefield M. Do graphic health warning labels have an impact on
7 adolescents' smoking-related beliefs and behaviours? *Addiction* 2008; 103(9):1562-
8 1571.
- 9 32. Fong GT, Hammond D, Jiang Y, Li Q, Quah AC, Driezen P, *et al.* Perceptions of tobacco health
10 warnings in China compared with picture and text-only health warnings from other
11 countries: an experimental study. *Tob Control* 2010; 19 Suppl 2:i69-i77.
- 12 33. Li L, Borland R, Yong HH, Fong GT, Jiang Y, Li Q, *et al.* Reported exposures to anti-smoking
13 messages and their impact on Chinese smoker's subsequent quit attempts. *Int J*
14 *Behav Med* 2014; 21(4):667-676.
- 15 34. Murray RL, Lewis SA, Coleman T, Britton J, McNeill A. Unplanned attempts to quit smoking:
16 missed opportunities for health promotion? *Addiction* 2009; 104(11):1901-1909.
- 17 35. Smith DR, Zhao I, Wang L. Tobacco smoking among doctors in mainland China: a study from
18 Shandong province and review of the literature. *Tob Induc Dis* 2012; 10(1):14.
- 19 36. Pan Z. Socioeconomic predictors of smoking and smoking frequency in urban China:
20 evidence of smoking as a social function. *Health Promot Int* 2004; 19(3):309-315.
- 21 37. Shakib S, Zheng H, Johnson CA, Chen X, Sun P, Palmer PH, *et al.* Family characteristics and
22 smoking among urban and rural adolescents living in China. *Prev Med* 2005;
23 40(1):83-91.
- 24 38. Sansone N, Fong GT, Lee WB, Laux FL, Sirirassamee B, Seo HG, *et al.* Comparing the
25 experience of regret and its predictors among smokers in four Asian countries:
26 findings from the ITC surveys in Thailand, South Korea, Malaysia, and China. *Nicotine*
27 *Tob Res* 2013; 15(10):1663-1672.
- 28 39. Caleyachetty A, Lewis S, McNeill A, Leonardi-Bee J. Struggling to make ends meet: exploring
29 pathways to understand why smokers in financial difficulties are less likely to quit
30 successfully. *Eur J Public Health* 2012; 22 Suppl 1:41-48.
- 31 40. Fernandez E, Schiaffino A, Borrell C, Benach J, Ariza C, Ramon JM, *et al.* Social class,
32 education, and smoking cessation: Long-term follow-up of patients treated at a
33 smoking cessation unit. *Nicotine Tob Res* 2006; 8(1):29-36.
- 34 41. John U, Meyer C, Hapke U, Rumpf HJ, Schumann A. Nicotine dependence, quit attempts, and
35 quitting among smokers in a regional population sample from a country with a high
36 prevalence of tobacco smoking. *Prev Med* 2004; 38(3):350-358.
- 37 42. Zhou X, Nonnemaker J, Sherrill B, Gilseman AW, Coste F, West R. Attempts to quit smoking
38 and relapse: factors associated with success or failure from the ATTEMPT cohort
39 study. *Addict Behav* 2009; 34(4):365-373.

- 1 43. Siahpush M, McNeill A, Borland R, Fong GT. Socioeconomic variations in nicotine
2 dependence, self-efficacy, and intention to quit across four countries: findings from
3 the International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006; 15
4 Suppl 3:iii71-iii75.
- 5 44. Yang GH, Ma JM, Liu N, Zhou LN. [Smoking and passive smoking in Chinese, 2002]. *Zhonghua*
6 *Liu Xing Bing Xue Za Zhi* 2005; 26(2):77-83.
- 7 45. Qing, S. Chinese officials banned from smoking in public. 2013.
8 http://news.xinhuanet.com/english/china/2013-12/29/c_133004982.htm (accessed
9 21-11-2014).
- 10 46. Cheng IS, Ernster VL, He GQ. Tobacco smoking among 847 residents of East Beijing, People's
11 Republic of China. *Asia Pac J Public Health* 1990; 4(2-3):156-163.
- 12 47. Brown WJ, Basil MD. Media Celebrities and Public-Health - Responses to Magic-Johnson Hiv
13 Disclosure and Its Impact on Aids Risk and High-Risk Behaviors. *Health*
14 *Communication* 1995; 7(4):345-370.
- 15 48. Larson, C. Meeting Peng Liyuan, China's first First Lady. 2013.
16 [http://www.businessweek.com/articles/2013-06-05/meeting-peng-liyuan-chinas-](http://www.businessweek.com/articles/2013-06-05/meeting-peng-liyuan-chinas-first-first-lady)
17 [first-first-lady](http://www.businessweek.com/articles/2013-06-05/meeting-peng-liyuan-chinas-first-first-lady) (accessed 21-11-2014).
- 18 49. AFP. Yao Ming enlisted as China anti-smoking ambassador. 2009.
19 [http://news.asiaone.com/News/Latest+News/Sports/Story/A1Story20091013-](http://news.asiaone.com/News/Latest+News/Sports/Story/A1Story20091013-173396.html)
20 [173396.html](http://news.asiaone.com/News/Latest+News/Sports/Story/A1Story20091013-173396.html) (accessed 21-11-2014).
- 21 50. Hu TW, Mao Z, Shi J. Recent tobacco tax rate adjustment and its potential impact on tobacco
22 control in China. *Tob Control* 2010; 19(1):80-82.
- 23 51. Levy D, Rodriguez-Buno RL, Hu TW, Moran AE. The potential effects of tobacco control in
24 China: projections from the China SimSmoke simulation model. *BMJ* 2014;
25 348:g1134.
- 26 52. Patrick DL, Cheadle A, Thompson DC, Diehr P, Koepsell T, Kinne S. The validity of self-
27 reported smoking: a review and meta-analysis. *Am J Public Health* 1994; 84(7):1086-
28 1093.
29
30

1 **Table legends**

2 Table 1: ^Please note that unweighted N are shown; HSI – Heaviness of smoking index; SEM –
3 Standard error of the mean

4 Table 2: ~Adjusted for all other variables (association which remain significant when accounting for
5 multiple comparisons are in bold); ^AOR per unit increase

6 Table 3: ~Adjusted for all other variables (association which remain significant when accounting for
7 multiple comparisons are in bold); ^AOR per unit increase