Figure 1 Flow diagram to show inclusion of participants
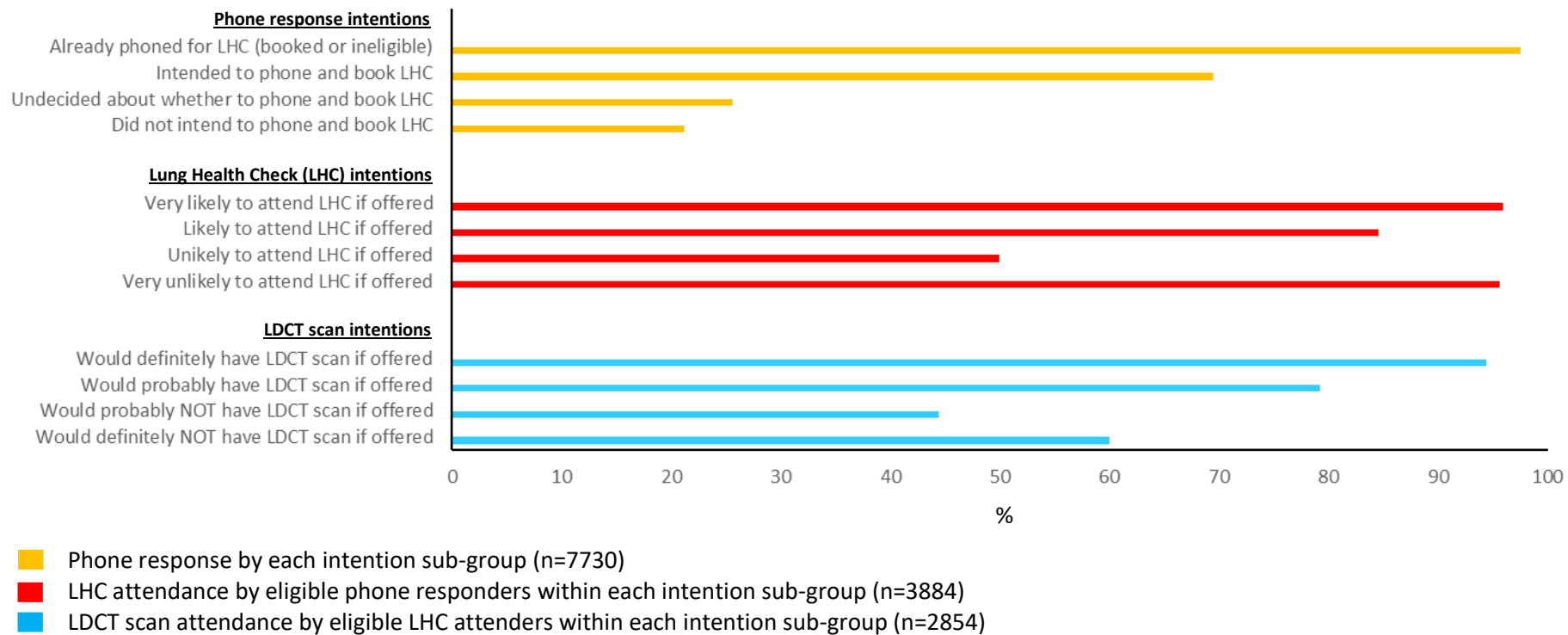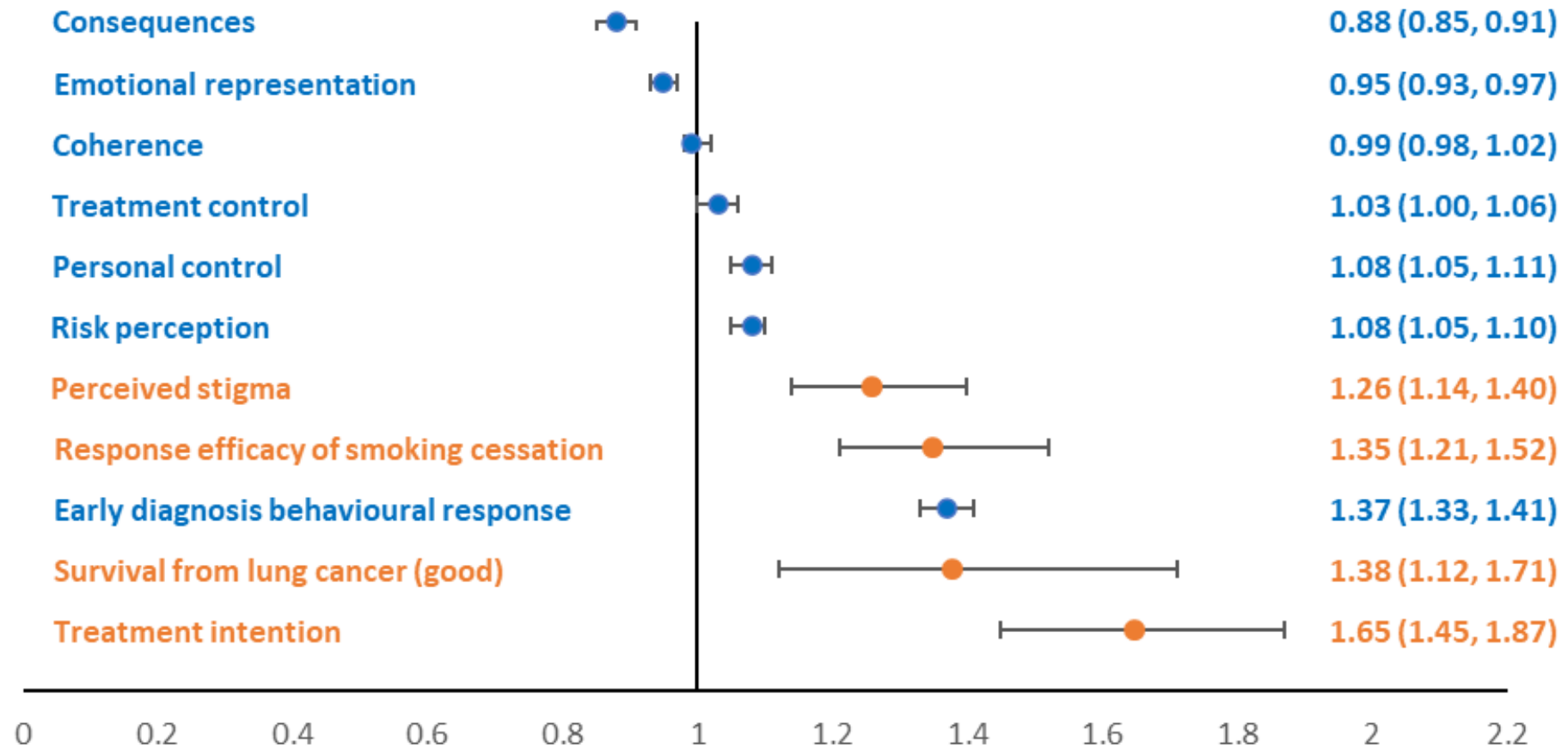
Phone response intentions
- Already phoned for LHC (booked or ineligible)
- Intended to phone and book LHC
- Undecided about whether to phone and book LHC
- Did not intend to phone and book LHC

Lung Health Check (LHC) intentions
- Very likely to attend LHC if offered
- Likely to attend LHC if offered
- Unikely to attend LHC if offered
- Very unlikely to attend LHC if offered

LDCT scan intentions
- Would definitely have LDCT scan if offered
- Would probably have LDCT scan if offered
- Would probably NOT have LDCT scan if offered
- Would definitely NOT have LDCT scan if offered

%

■ Phone response by each intention sub-group (n=7730)
■ LHC attendance by eligible phone responders within each intention sub-group (n=3884)
■ LDCT scan attendance by eligible LHC attenders within each intention sub-group (n=2854)

Figure 2 Frequency of each screening uptake behaviour by behavioural intentions of those eligible at each stage

Construct	Odds ratio (95% CI)
Consequences	0.88 (0.85, 0.91)
Emotional representation	0.95 (0.93, 0.97)
Coherence	0.99 (0.98, 1.02)
Treatment control	1.03 (1.00, 1.06)
Personal control	1.08 (1.05, 1.11)
Risk perception	1.08 (1.05, 1.10)
Perceived stigma	1.26 (1.14, 1.40)
Response efficacy of smoking cessation	1.35 (1.21, 1.52)
Early diagnosis behavioural response	1.37 (1.33, 1.41)
Survival from lung cancer (good)	1.38 (1.12, 1.71)
Treatment intention	1.65 (1.45, 1.87)

NOTE: Psychological constructs marked in orange were measured with single items and dichotomised whereas those marked in blue were measured using three item sub-scales to produce a score (odds are per unit increase along a 13 point scale). Higher scores meant either more positive perceptions (of consequences, emotional representation, early diagnosis behavioural response) or higher levels of the construct (perceived personal control, treatment control, coherence, and perceived risk).

Figure 3 Forest plot of the adjusted associations between each SRQ-LCS psychological construct and screening uptake

Table 1 Characteristics of the sample

	All responders (n=7730)	All sent questionnaire[e] (n=43,557)
Gender, n (%)[a]		
Female	3438 (45.0)	18,275 (42.0)
Male	4248 (55.0)	25,281 (58.0)
Age, mean (SD, range)[a]	64.6 (6.2, 55-77)	63.1 (6.2, 55-77)
Relationship status, n (%)[b]		
Married/Civil partnership/Cohabiting	4024 (51.7)	-
Single/Never married	1329 (17.0)	-
Divorced/Separated	1524 (19.5)	-
Widowed	660 (8.5)	-
Missing/more than one response	260 (3.3)	-
Ethnicity, n (%)[a]		
White	5623 (72.7)	28,202 (64.7)
Mixed/Multiple ethnic groups	131 (1.7)	855 (2.0)
Black (British/African/Caribbean)	433 (5.6)	3694 (8.5)
Asian/Asian British	580 (7.5)	4836 (11.1)
Other ethnic group	307 (4.0)	2115 (4.9)
Prefer not to say/Missing	656 (8.5)	3855 (8.9)
IMD rank quintile, n (%)[a]		
Quintile 1 (most deprived)	2149 (27.8)	14,729 (33.8)
Quintile 2	2256 (29.2)	12,658 (29.1)
Quintile 3	1513 (19.6)	7539 (17.3)
Quintile 4	1287 (16.6)	6085 (14.0)
Quintile 5 (least deprived)	435 (5.6)	2033 (4.7)
Missing	90 (1.2)	513 (1.2)
Smoking status, n (%) (self-reported/primary care)		
Current smoker (daily)	2323 (30.1)/ 3094 (40.0)	21,286 (48.9)
Current smoker (occasional/non-daily)	512 (6.6)/ 19 (0.2)	162 (0.4)
Other tobacco (current/former, n=20)	322 (4.2)/ 103 (1.4)	654 (1.5)
Former smoker (including occasional, n=46)	3832 (49.6)/ 3632 (46.9)	16,080 (36.9)
Never smoker	272 (3.5)/ 625 (8.1)	3921 (9.0)
Missing/more than one response/Unknown	469 (6.1)/ 257 (3.3)	1454 (3.3)
Age started smoking daily, mean (SD, range) [b,c]	18.1 (5.9, 5-65)	-
Tobacco consumption, mean (SD, range) [b,c]		
Cigarettes per day	15.9 (9.9, 1-80)	-
Grams of tobacco per week	53.9 (59.2, 4-700)	-
Time to smoke first cigarette after waking (measure of tobacco dependence), n (%)[b,e]	409 (17.6)	-
Within 5 minutes	992 (42.7)	-
5-30 minutes	379 (16.3)	-
31-60 minutes	411 (17.7)	-
60+ minutes	132 (5.7)	-
Missing		

NOTES: Per cent totals may not sum due to rounding; [a] Data extracted from primary care; [b] Self-reported data collecting using questionnaire; [c] Current and former smokers only (self-reported in survey, n=6155); [d] Current daily smokers only (self-reported in survey, n=2323); [e] Excluding those who subsequently opted out of their data being used from primary care

Table 2 Adjusted regression coefficients for the associations between demographic factors, smoking status, and sub-scale SRQ-LCS scores

	Consequences[a]	Personal control[a]	Treatment control[a]	Coherence[a]	Emotional representation[a]	Early diagnosis behavioural response[a]	Risk perception[a]
	B (95% CI)[b]	B (95% CI)[b]	B (95% CI)[b]	B (95% CI)[b]	B (95% CI)[b]	B (95% CI)[b]	B (95% CI)[b]
Gender	p=.13	p<.001	p<.001	p<.001	p<.001	p=.13	p<.001
Female	REF	REF	REF	REF	REF	REF	REF
Male	0.06 (-0.02, 0.14)	0.38 (0.28, 0.47)	0.35 (0.25, 0.45)	-0.23 (-0.35, -0.11)	0.65 (0.53, 0.78)	-0.08 (-0.18, 0.02)	-0.43 (-0.56, -0.31)
Age	p<.001	p=.01	p<.001	p=.01	p<.001	p<.001	p<.001
	0.02 (0.01, 0.02)	-0.01 (-0.02, -0.00)	0.02 (0.01, 0.03)	0.01 (0.00, 0.02)	0.04 (0.03, 0.05)	-0.02 (-0.03, -0.01)	-0.03 (-0.04, -0.02)
IMD rank quintile	p<.001	p<.001	p=.28	p=.25	p=.93	p<.01	p=.20
Quintile 1 (most deprived)	REF	REF	REF	REF	REF	REF	REF
Quintile 2	-0.15 (-0.25, -0.05)	0.15 (0.03, 0.27)	-0.09 (-0.22, 0.04)	0.05 (-0.10, 0.21)	-0.01 (-0.17, 0.15)	0.11 (-0.02, 0.24)	-0.05 (-0.21, 0.11)
Quintile 3	-0.24 (-0.36, -0.13)	0.25 (0.11, 0.39)	-0.13 (-0.27, 0.02)	0.12 (-0.05, 0.30)	-0.05 (-0.23, 0.14)	0.18 (0.04, 0.33)	-0.18 (-0.36, -0.01)
Quintile 4	-0.32 (-0.44, -0.20)	0.41 (0.26, 0.56)	0.01 (-0.15, 0.16)	0.16 (-0.03, 0.34)	-0.08 (-0.27, 0.12)	0.26 (0.11, 0.41)	-0.18 (0.37, 0.01)
Quintile 5 (least deprived)	-0.40 (-0.59, -0.21)	0.35 (0.12, 0.57)	-0.13 (-0.37, 0.11)	0.26 (-0.02, 0.55)	-0.08 (-0.38, 022)	0.38 (0.15, 0.61)	-0.11 (-0.39, 0.18)
Relationship status	p=.03	p=.32	p<.01	p=.05	p=.04	p<.01	p=.57
Married/Cohabiting	REF	REF	REF	REF	REF	REF	REF
Single/Separated/Widowed	0.09 (0.01, 0.17)	-0.05 (-0.15, 0.05)	-0.15 (-0.25, -0.05)	-0.12 (-0.25, 0.00)	0.14 (0.01, 0.27)	-0.17 (-0.27, -0.07)	0.04 (-0.09, 0.16)
Ethnicity	p<.001	p<.001	p<.001	p<.001	p<.001	p<.001	p=.70
White	REF	REF	REF	REF	REF	REF	REF
Mixed/Multiple	0.33 (0.03, 0.64)	-0.25 (-0.62, 0.12)	0.38 (0.16, 0.60)	-0.52 (-0.98, -0.05)	-0.18 (-0.67, 0.31)	-0.36 (-0.73, 0.02)	-0.00 (-0.46, 0.45)
Black	0.55 (0.38, 0.72)	-0.02 (-0.22, 0.19)	0.38 (0.16, 0.60)	-0.62 (-0.88, -0.35)	-0.16 (-0.43, 0.12)	-0.31 (-0.52, -0.10)	-0.02 (-0.28, 0.24)
Asian	0.68 (0.53, 0.84)	-0.76 (-0.94, -0.58)	0.59 (0.40, 0.78)	-0.41 (-0.64, -0.19)	-0.59 (-0.83, -0.35)	-0.67 (-0.86, -0.49)	0.19 (-0.04, 0.42)
Other	0.30 (0.11, 0.49)	-0.59 (-0.83, -0.36)	0.36 (0.12, 0.60)	0.02 (-0.27, 0.31)	-0.35 (-0.66, -0.05)	-0.53 (-0.77, -0.29)	0.07 (-0.22, 0.36)
Prefer not to say/Not stated	-0.02 (-0.31, 0.26)	-0.05 (-0.40, 0.29)	-0.13 (-0.49, 0.23)	-0.33 (-0.75, 0.10)	0.07 (-0.39, 0.53)	0.03 (-0.32, 0.39)	-0.02 (-0.46, 0.42)
Smoking status	p<.001	p<.001	p=.37	p=.20	p=.01	p<.001	p<.001
Former smoker (daily/occasional)	REF	REF	REF	REF	REF	REF	REF
Current smoker (daily)	0.22 (0.13, 0.31)	-0.29 (-0.40, -0.18)	-0.05 (-0.16, 0.06)	-0.13 (-0.26, 0.01)	-0.05 (-0.19, 0.10)	-0.36 (-0.47, -0.25)	1.33 (1.19,1.47)
Current smoker (occasional)	0.02 (-0.14, 0.18)	0.03 (-0.17, 0.22)	0.06 (-0.15, 0.26)	0.03 (-0.22, 0.27)	-0.31 (-0.57, -0.05)	-0.17 (-0.37, 0.04)	0.83 (0.58, 1.07)
Other tobacco	0.09 (-0.11, 0.29)	-0.18 (-0.42, 0.07)	0.21 (-0.05, 0.47)	0.20 (-0.11, 0.50)	-0.15 (-0.47, 0.18)	-0.33 (-0.58, -0.08)	0.82 (0.52, 1.12)
Never smoker	0.03 (-0.20, 0.25)	0.14 (-0.12, 0.41)	0.07 (-0.21, 0.35)	-0.20 (-0.53, 0.14)	0.47 (0.11, 0.82)	-0.36 (-0.63, -0.09)	-1.35 (-1.70, -1.00)
Missing/multi-response	0.62 (0.44, 0.81)	-0.44 (-0.67, -0.22)	0.10 (-0.14, 0.33)	-0.07 (-0.36, 0.22)	-0.16 (0.46, 0.15)	-0.88 (-1.10, -0.66)	0.46 (0.20, 0.73)

NOTES: See Supplementary Table 2 for mean scores. Higher scores meant more positive perceptions (consequences, emotional representation, early diagnosis behavioural response) or higher levels of the construct (perceived personal control, treatment control, coherence, and perceived risk).[a] Sub-scale scores range of 3-15; [b]Linear regression analyses adjusted for demographics and smoking status

Table 3 Adjusted odds ratios for the associations between demographic factors, smoking status, and single item SRQ-LCS constructs

	Response efficacy of smoking cessation	Perceived stigma	Treatment intention	Survival from lung cancer
	Moderately/Extremely (vs. Not at all/Slightly/Somewhat)	**Strongly agree/Agree** (vs. Strongly disagree/ Disagree/Neither)	**Strongly agree/Agree** (vs. Strongly disagree/ Disagree/Neither)	**Good/Fair** (vs. Poor/Not sure)
	OR (95% CI)[a]	OR (95% CI)[a]	OR (95% CI)[a]	OR (95% CI)[a]
Gender	p=.05	p<.001	p=.04	p=.13
Female	REF	REF	REF	REF
Male	1.12 (1.00, 1.26)	0.75 (0.68, 0.83)	1.14 (1.01, 1.30)	1.09 (0.98, 1.21)
Age	p<.001	p=.01	p=.25	p=.01
	0.99 (0.98, 0.99)	0.99 (0.98, 0.99)	0.99 (0.98, 1.00)	1.01 (1.00, 1.02)
IMD rank quintile	p<.001	p<.001	p=.20	p=.53
Quintile 1 (most deprived)	REF	REF	REF	REF
Quintile 2	0.99 (0.86, 1.14)	1.11 (0.98, 1.26)	1.03 (0.88, 1.21)	0.98 (0.86, 1.12)
Quintile 3	1.24 (1.05, 1.47)	1.24 (1.07, 1.43)	1.05 (0.88, 1.27)	1.05 (0.90, 1.22)
Quintile 4	1.37 (1.14, 1.63)	1.44 (1.24, 1.69)	1.28 (1.04, 1.57)	1.09 (0.92, 1.28)
Quintile 5 (least deprived)	1.15 (0.88, 1.51)	1.44 (1.13, 1.82)	1.04 (0.77, 1.41)	1.8 (0.92, 1.53)
Relationship status	p=.48	p=.29	p<.001	p=.01
Married/Cohabiting	REF	REF	REF	REF
Single/Separated/Widowed	0.96 (0.86, 1.08)	0.95 (0.85, 1.05)	0.76 (0.67, 0.87)	0.85 (0.77, 0.95)
Ethnicity	p=.13	p<.001	p=.34	p<.001
White	REF	REF	REF	REF
Mixed/Multiple	0.90 (0.59, 1.36)	0.73 (0.50, 1.07)	1.45 (0.85, 2.47)	0.79 (0.55,1.15)
Black	0.83 (0.65, 1.05)	0.63 (0.51, 0.78)	1.06 (0.81, 1.39)	0.87 (0.70, 1.08)
Asian	0.93 (0.75, 1.15)	0.64 (0.53, 0.78)	0.82 (0.65, 1.03)	0.70 (0.58, 0.85)
Other	0.76 (0.58, 0.98)	0.51 (0.40, 0.65)	0.47 (0.66, 1.21)	0.79 (0.62, 1.01)
Prefer not to say/Not stated	1.11 (0.73, 1.68)	0.14 (0.79, 1.65)	0.99 (0.62, 1.58)	1.48 (0.97, 2.26)
Smoking status	p<.001	p=.01	p=.02	p<.001
Former smoker (daily/occasional)	REF	REF	REF	REF
Current smoker (daily)	0.46 (0.41, 0.52)	1.20 (1.07, 1.35)	0.80 (0.69, 0.92)	0.66 (0.58, 0.74)
Current smoker (occasional)	0.90 (0.71, 1.15)	1.10 (0.89, 1.34)	0.80 (0.82, 1.03)	0.91 (0.73, 1.12)
Other tobacco	0.63 (0.48, 0.83)	0.92 (0.71, 1.18)	0.81 (0.59, 1.11)	0.79 (0.61, 1.02)
Never smoker	1.13 (0.80, 1.58)	0.89 (0.68, 1.18)	1.20 (0.82, 1.76)	0.82 (0.61, 1.09)
Missing/multi-response	0.62 (0.48, 0.80)	0.96 (0.76, 1.21)	0.83 (0.63, 1.11)	0.77 (0.62, 0.96)

NOTES: See Supplementary Table 3 for frequencies. [a]Logistic regression analyses adjusted for demographics and smoking status.