Smoking-related knowledge and health risk beliefs in a national sample of Aboriginal and Torres Strait Islander people

Abstract

Objectives: To describe general knowledge and perceived risk of the health consequences of smoking among Aboriginal and Torres Strait Islander people; and to assess whether knowledge varies among smokers and whether higher knowledge and perceived risk are associated with quitting.

Design, setting and participants: The Talking About The Smokes project used quota sampling to recruit participants from communities served by 34 Aboriginal community-controlled health services and one community in the Torres Strait. Baseline survey data were collected from 2522 Aboriginal and Torres Strait Islander adults from April 2012 to October 2013.

Main outcome measures: Knowledge of direct effects of smoking and harms of second-hand smoke (SHS), risk minimisation, health worry, and wanting and attempting to quit.

Results: Most Aboriginal and Torres Strait Islander participants who were daily smokers demonstrated knowledge that smoking causes lung cancer (94%), heart disease (89%) and low birthweight (82%), but fewer were aware that it makes diabetes worse (68%). Similarly, almost all daily smokers knew of the harms of SHS: that it is dangerous to non-smokers (90%) and children (95%) and that it causes asthma in children (91%). Levels of knowledge among daily smokers were lower than among non-daily smokers, ex-smokers and never-smokers. Among smokers, greater knowledge of SHS harms was associated with health worry, wanting to quit and having attempted to quit in the past year, but knowledge of direct harms of smoking was not.

Conclusion: Lack of basic knowledge about the health consequences of smoking is not an important barrier to trying to quit for Aboriginal and Torres Strait Islander smokers. Framing new messages about the negative health effects of smoking in ways that encompass the health of others is likely to contribute to goal setting and prioritising quitting among Aboriginal and Torres Strait Islander people.

Fifty years since the United States Surgeon General's first report on smoking and health, smoking prevalence has reduced globally,[1] in part due to increased public awareness that smoking causes death and disease.[2,3] However, it is possible that gaps in knowledge are contributing to health inequalities.[4,5] In Australia, the prevalence of daily smoking has declined to just over 16% among adults but is higher in disadvantaged populations.[6] Among the Aboriginal and Torres Strait Islander population, 42% of people aged 15 years or older smoked daily in 2012–2013.[7] Understanding and tackling the causes of this disparity is a public health priority accepted by all Australian governments.[8]

Communicating information about the harmful effects of tobacco use is a major focus of programs to reduce smoking among Aboriginal and Torres Strait Islander peoples.[9] Some evidence suggests that most Aboriginal and Torres Strait Islander people know that smoking causes lung cancer and heart disease,[10-12] and that second-hand smoke (SHS) is dangerous.[13-15] However, there is no current national research that describes knowledge of the harms of smoking and SHS exposure among Aboriginal and Torres Strait Islander smokers, or how it varies across this diverse population. Further, the extent to which lack of smoking-related knowledge contributes to the high smoking prevalence is unknown.

Greater knowledge and worry about future health effects of smoking have been shown to increase quit intentions and attempts in other settings.[16-18] However, decisions to quit smoking are not one-dimensional, rational choices,[19,20] and they may be obstructed by beliefs that diminish the likelihood or severity of smoking harms (risk minimisation).[21,22] There has been some investigation into risk-minimising beliefs in Aboriginal and Torres Strait Islander tobacco control research. For example, perceived risk and worry may be low where there is discordance between information about the health consequences of smoking and the individual's lived experience,[14,23] or where there are fatalistic views of health effects that are perceived to be outside an individual's control.[12,24] This may explain why smoking persists in some contexts where knowledge of health effects is found to be high.

This is the first broadly representative description of smoking-related knowledge and health risk beliefs of Aboriginal peoples and Torres Strait Islanders. We also look at how this knowledge varies among smokers, and whether knowledge and health risk beliefs are related to quitting.

Methods

Survey design and participants

The Talking About The Smokes (TATS) project surveyed 2522 Aboriginal and Torres Strait Islander people (1643 current smokers, 311 ex-smokers and 568 never-smokers) from April 2012 to October 2013 (Wave 1, or baseline), and is described in detail elsewhere in this supplement.[25,26] Briefly, we used a quota sampling design to recruit participants from communities served by 34 Aboriginal community-controlled health services (ACCHSs) and one community in the Torres Strait (project sites), which were selected based on the population distribution of Aboriginal and Torres Strait Islander people by state or territory and remoteness. In most sites (30/35),

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we aimed to interview samples of 50 smokers (or ex-smokers who had quit ≤ 12 months before) and 25 non-smokers (never-smokers and ex-smokers who had quit > 12 months previously), with equal numbers of men and women and those aged 18–34 years and 35 years or older. The sample sizes were doubled in four major urban sites and in the Torres Strait community. People were excluded if they were: not Indigenous, not aged 18 years or older, not usual residents of the area, staff members of the ACCHS, or unable to complete the survey in English (if there was no interpreter available), or if the quota for the relevant age–sex–smoking category had been filled.

In each site, different locally determined methods were used to collect a representative, albeit non-random, sample. The baseline sample closely matched the sample distribution of the 2008 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) by age, sex, jurisdiction and remoteness, and also number of cigarettes smoked per day for current daily smokers. However, there were inconsistent differences in some socioeconomic indicators: our sample had higher proportions of unemployed people, but also higher proportions who had completed Year 12 and who lived in more advantaged areas.[25]

Interviews were conducted face to face by trained interviewers, almost all of whom were members of the local Aboriginal and Torres Strait Islander community. The survey, entered directly onto a computer tablet, generally took 30–60 minutes to complete. A single survey of health service activities, including whether there were dedicated tobacco control resources, was completed for each site. The project was approved by three Aboriginal human research ethics committees (HRECs) and two HRECs with Aboriginal subcommittees (Appendix 1).[25]

Survey questions

As the TATS project is part of the International Tobacco Control Policy Evaluation Project (ITC Project), survey questions were based on ITC Project surveys previously used in Australia and New Zealand (http://www.itcproject.org/surveys). The exact questions used for this article are listed in Appendix 2.

Knowledge and health risk beliefs

Four questions assessed knowledge of the direct health effects of smoking among smokers and non-smokers — whether it causes lung cancer, causes heart disease, makes diabetes worse and causes low birthweight (answer options: "yes", "no" or "don't know"). Three questions assessed knowledge of the effects of SHS exposure — whether it causes asthma in children ("yes", "no" or "don't know") and whether it is dangerous to non-smokers and to children (both assessed on a five-point scale from "strongly agree" to "strongly disagree"). We also computed two summary items, for correct responses to all four direct effects questions ("yes" to all) and correct responses to all three SHS measures ("yes" or at least "agree").

Two items assessed health risk beliefs among smokers. Smokers who responded "agree" or "strongly agree" to the statement that "Smoking is not very risky when you think about all the things that people do" (assessed on a five-point scale from "strongly agree" to "strongly disagree") were assessed as holding risk-minimising beliefs. Those who responded "very worried" to the question "How worried are you that smoking will damage your health in the future?" (assessed on a four-point scale from "not at all worried" to "very worried") were assessed as having health worry.

Wanting and attempting to quit

Two quit-related outcomes were used: wanting to quit ("yes" or "no") and having attempted to quit in the past year ("yes" or "no"), which was derived from questions on ever having tried to quit and timing of the most recent quit attempt.

Statistical analyses

Percentages and frequencies were calculated for all knowledge and health risk belief questions. Logistic regression was used to assess: (i) variation in correct responses among smokers, by daily smoking status, key sociodemographic variables, and presence of tobacco control resources at the local health service; and (ii) the association of knowledge and health risk beliefs with quitting interest and activity among smokers. Stata 13 (StataCorp) survey [SVY] commands were used to adjust for the sampling design, identifying the 35 project sites as clusters, and the quotas based on age, sex and smoking status as strata.[27] Both unadjusted and adjusted logistic regression analyses were performed, with daily smoking status and key sociodemographic variables included as covariates in the adjusted analyses. As unadjusted and adjusted calculations were very similar, only adjusted odds ratios (ORs) are reported here, with 95% confidence intervals.

Less than 1.5% of responses to each question were excluded (due to missing or refused responses), with the exception of quitting outcomes, which excluded a further 79 participants (4.8%) who did not know if they wanted to quit and 21 (1.3%) who did not know whether they had attempted to quit within the past year.

Results

Knowledge and health risk beliefs

Knowledge that smoking causes lung cancer and heart disease was high, and consistently over 90% of smokers and non-smokers knew about the harmful effects of SHS (Box 1). Knowledge that smoking makes diabetes worse was the lowest of all four direct effects, with 24% of daily smokers responding "don't know" to this question (compared with 13% for low birthweight, 7% for heart disease and 3% for lung cancer). Among daily smokers, 44% held risk-minimising beliefs and 36% had health worry. Non-daily smokers had higher levels of risk-minimising beliefs and lower levels of health worry than did daily smokers.

Compared with daily smokers, non-daily smokers were more likely to respond correctly to all questions about the direct effects of smoking (OR, 1.79; 95% CI, 1.32–2.43; $P < 0.001$) and the harms of SHS (OR, 1.69; 95% CI, 1.08–2.62; $P = 0.02$) (Appendix 3).

1 Smoking-related knowledge and health risk beliefs in a national sample of Aboriginal and Torres Strait Islander peoples*

Survey question and response	Daily smokers (*n* = 1392)	Non-daily smokers (*n* = 251)	Ex-smokers (*n* = 311)	Never-smokers (*n* = 568)
Knowledge of direct health effects of smoking				
Does smoking cause lung cancer?				
Yes	94% (1305)	96% (242)	96% (298)	99% (560)
No	2% (34)	1% (3)	2% (5)	1% (4)
Don't know	3% (45)	2% (6)	2% (7)	1% (4)
Does smoking cause heart disease?				
Yes	89% (1234)	92% (231)	92% (286)	93% (526)
No	4% (50)	2% (6)	4% (11)	2% (13)
Don't know	7% (101)	6% (14)	4% (13)	5% (29)
Does smoking make diabetes worse?				
Yes	68% (945)	78% (197)	71% (220)	77% (435)
No	7% (102)	6% (15)	5% (16)	5% (28)
Don't know	24% (338)	16% (39)	24% (74)	18% (105)
Does smoking cause low birthweight?				
Yes	82% (1131)	87% (218)	84% (261)	88% (499)
No	5% (75)	3% (7)	5% (15)	2% (9)
Don't know	13% (179)	10% (25)	11% (33)	11% (60)
Correct response to all four questions on direct effects of smoking	59% (822)	72% (181)	61% (190)	71% (403)
Knowledge of health effects of second-hand smoke				
Does smoking cause asthma in children from second-hand smoke?				
Yes	91% (1265)	94% (235)	95% (293)	94% (535)
No	3% (38)	2% (6)	2% (7)	1% (6)
Don't know	6% (82)	4% (10)	3% (10)	5% (27)
Cigarette smoke is dangerous to non-smokers				
Agree or strongly agree	90% (1251)	95% (238)	95% (295)	96% (546)
Neutral or don't know	7% (92)	3% (7)	2% (7)	2% (14)
Disagree or strongly disagree	3% (40)	2% (6)	2% (7)	1% (8)
Cigarette smoke is dangerous to children				
Agree or strongly agree	95% (1317)	98% (245)	99% (306)	99% (560)
Neutral or don't know	4% (52)	2% (4)	1% (2)	1% (6)
Disagree or strongly disagree	1% (14)	1% (2)	0 (1)	0 (2)
Correct response to all three questions on harms of second-hand smoke	85% (1173)	90% (227)	91% (282)	91% (518)
Health risk beliefs				
Smoking is not very risky when you think about all the things that people do				
Agree or strongly agree	44% (605)	50% (126)	—	—
Neutral or don't know	18% (243)	16% (39)	—	—
Disagree or strongly disagree	39% (535)	34% (86)	—	—
How worried are you that smoking will damage your health in the future?				
Very worried	36% (498)	27% (68)	—	—
A little or moderately worried	54% (735)	63% (156)	—	—
Not at all worried	10% (138)	10% (24)	—	—

*Results are based on the baseline sample (*n* = 2522) of the Talking About The Smokes project and are presented as % (frequency). Refused responses are excluded. ◆

There was some social patterning based on sociodemographic variables (Appendix 3). While knowledge of direct effects was significantly associated with employment and education, only area-level indicators were associated with both direct effects and SHS knowledge. Smokers were more likely to respond correctly to all questions if they were from a remote or very remote area (direct effects OR, 1.73; 95% CI, 1.16–2.57; SHS OR, 2.69; 95% CI, 1.61–4.52), compared with those from major cities, and smokers from an area of the highest level

2 Association of knowledge and health risk beliefs with wanting and attempting to quit in a national sample of Aboriginal and Torres Strait Islander smokers*

	Want to quit			Attempted to quit in the past year		
Knowledge and health risk beliefs	% (frequency)†	Adjusted OR (95% CI)‡	*P*§	% (frequency)†	Adjusted OR (95% CI)‡	*P*§
Knowledge about direct effects of smoking						
Fewer than all four questions correct	66% (395)	1.0	0.16	50% (312)	1.0	0.67
All four questions correct	72% (686)	1.21 (0.93–1.57)		49% (482)	0.95 (0.77–1.18)	
Knowledge about harms of second-hand smoke						
Fewer than all three questions correct	46% (101)	1.0	< 0.001	36% (83)		< 0.001
All three questions correct	74% (981)	3.26 (2.25–4.70)		52% (710)	1.89 (1.38–2.57)	
Risk-minimising beliefs						
Don't know or disagree (neutral)	72% (622)	1.0	0.21	50% (440)	1.0	0.79
Agree	67% (461)	0.83 (0.62–1.11)		49% (353)	0.97 (0.78–1.21)	
Health worry						
Not at all or moderately worried	59% (576)	1.0	< 0.001	43% (450)	1.0	< 0.001
Very worried	90% (500)	6.17 (4.40–8.66)		60% (338)	2.14 (1.68–2.73)	

OR = odds ratio. * Results are based on the baseline sample of current smokers ($n = 1643$) in the Talking About The Smokes project. † Percentages and frequencies exclude refused responses (for all variables) and "don't know" responses (with the exception of knowledge questions, where "don't know" is coded as incorrect). ‡ ORs are adjusted for daily smoking status and key sociodemographic variables (age, sex, identification as Aboriginal and/or Torres Strait Islander, labour force status, highest level of education, remoteness and area-level disadvantage). § *P* values are reported for overall variable significance, using adjusted Wald tests. ◆

of disadvantage were more likely to respond correctly (direct effects OR, 1.83; 95% CI, 1.32–2.54; SHS OR, 1.33; 95% CI, 0.85–2.08) than were those from areas of least disadvantage.

Conversely, smokers from areas where the local health service had dedicated tobacco control staff or funding were less likely to respond correctly to all direct effects questions (OR, 0.64; 95% CI, 0.48–0.86) and all questions about the harms of SHS (OR, 0.58; 95% CI, 0.40–0.82), compared with those from areas where there were no dedicated resources (Appendix 3).

Relationship of knowledge and health risk beliefs with quitting

Smokers who responded correctly to all questions about harms of SHS were more likely to want to quit and to have attempted to quit in the past year, but those who responded correctly to questions about direct effects of smoking were not (Box 2). Similarly, smokers who responded correctly to all SHS knowledge questions were more likely to be very worried about their future health (OR, 4.74; 95% CI, 3.01–7.45; $P < 0.001$), but those with knowledge of all direct effects were not (Appendix 4). Those who were very worried about their health were more likely to want to quit and to have made a quit attempt in the past year (Box 2). Risk-minimising beliefs were not significantly associated with either wanting to quit or having attempted to quit in the past year.

Discussion

Our results show high levels of knowledge among Aboriginal and Torres Strait Islander people that smoking causes lung cancer and heart disease, along with strong awareness of the harms of SHS, consistent with previous tobacco control research in this population.[10-14] Knowledge that smoking causes lung cancer and heart disease and is dangerous to others was assessed at very similar levels among Aboriginal and Torres Strait Islander daily smokers and those in the general population, based on comparable measures last assessed by Australian ITC Project surveys from 2002 to 2004.[16,28]

The main gap in knowledge, which has also been reported elsewhere,[12] concerned the role of smoking in exacerbating diabetes. As Aboriginal and Torres Strait Islander people are more than three times as likely as non-Indigenous Australians to report a diagnosis of diabetes or high blood or urine sugar levels,[7] with diabetes prevalence estimates ranging from 3.5% to 33.1%,[29] this gap highlights the need for targeted education about the link between smoking and diabetes. This applies to clinicians as well as the broader Aboriginal and Torres Strait Islander population, particularly in light of updated evidence presented in the 2014 report of the US Surgeon General, which concludes that smoking increases the risk of developing type 2 diabetes in a clear dose–response manner.[2]

Our results also show a need to build knowledge that smoking causes low birthweight, which was either denied or not known by 18% of daily smokers, similar to previous findings.[14,30] Messages that smoking causes lung cancer and heart disease and is dangerous to children have all featured on cigarette pack warning labels.[31] Together with other sources of health information, such as mass media, news stories, local health promotion strategies and advice from health professionals, these are likely to have contributed to the high knowledge about these health effects among our Aboriginal and Torres Strait Islander participants.

Given health services are an important source of health information, it was surprising that knowledge was lower among smokers surveyed by sites with dedicated tobacco

control resources. Though difficult to explain, this may be an indirect effect of the prioritisation of limited tobacco control resources to areas of greatest need, particularly as these resources included federally funded positions that had not long been established.[9] Alternatively, it may suggest that information about the health effects of smoking is more effective when incorporated into established routine health service activities that include other areas of health and wellbeing.

Our findings suggest that gaps in knowledge are not responsible for the high prevalence of smoking or the social patterning of smoking among Aboriginal and Torres Strait Islander people. Contrary to the geographic and social patterning of smoking prevalence among Aboriginal and Torres Strait Islander people,[7,32] we found that those from more remote and disadvantaged areas were more knowledgeable about the harmful effects of smoking and SHS. This is not to say that increasing knowledge is not important; prospective analyses from other ITC Project studies consistently show that knowledge, worry and risk beliefs contribute to motivation to quit.[16,18,22,33] Though we have shown that knowledge is also related to interest in quitting among Aboriginal and Torres Strait Islander smokers, other factors are likely to be more important in influencing the success of quit attempts (and their translation to reduced prevalence), as found in other populations.[17] For example, stress is commonly cited by Aboriginal and Torres Strait Islander smokers as a trigger for relapse,[12,15,34,35] and it should be considered among other possible barriers including social normalisation of smoking, underlying social disadvantage, nicotine dependence and access to and uptake of services to support quitting.[36]

Among smokers, knowledge of SHS harms was associated with wanting to quit and attempts to quit, but knowing about direct, personal health consequences was not. Similarly, in an ITC Project survey in New Zealand, setting an example to children was more likely to be identified by Maori and Pacific peoples as a reason to quit, and was associated with SHS awareness and protective behaviour among smokers.[37] Our findings are also consistent with qualitative research from the Northern Territory,[15,24] in which Aboriginal participants expressed higher levels of concern for the health of others than for personal risk. Health is considered by many Aboriginal and Torres Strait Islander people to include the health of others.[38] This may also explain why risk-minimising beliefs did not reduce interest in quitting, as predicted from research in the general population, despite being held at similar levels.[21,22] It may be that these counter-arguments are an ineffective shield to risks that include the health of others, and so have little or no effect on interest in quitting among Aboriginal and Torres Strait Islander people.

Our findings weaken the argument that risk-minimising beliefs explain why smoking persists in contexts where knowledge is high, and provide evidence that challenging these beliefs is unlikely to increase interest in quitting among Aboriginal and Torres Strait Islander people. Rather, health information may be interpreted with greater priority and relevance where negative health effects are framed in ways that include the health of others. This supports the approach used in the "Break the Chain" campaign, Australia's first national Aboriginal and Torres Strait Islander antismoking campaign, launched in March 2011.[39]

Strengths and limitations

This is the first broadly representative survey of knowledge and health risk beliefs about smoking among Aboriginal and Torres Strait Islander peoples. The survey design made it feasible to interview a large number of people and to explore variation within our sample.

However, use of closed-ended questions may have led to overestimation of knowledge,[40,41] which was assessed for a limited number of general health consequences of smoking. Knowledge may also have been overestimated if participants responded "yes" without fully scrutinising each question or because they did not want to appear uninformed. However, variation in the proportion of respondents who showed uncertainty in response to each item is evidence against this being systematic. Repeating the analyses with the "no" response as the dependent variable found the same general pattern of results (reversed). This increased our confidence in the validity of these outcomes, but did show that respondents from the most remote and disadvantaged areas were less likely to respond "don't know", consistent with biases to acquiesce or provide socially desirable responses in these areas. Some of the differences found, particularly area-level ones, may be due to social desirability biases, which are thought to be moderated by culture.[42] Although face-to-face interviews can increase perceived pressure to provide socially acceptable responses, we attempted to reduce any such effects by engaging local interviewers, to minimise the social distance between the interviewer and participant.[42]

The questions used to assess health worry and risk minimisation showed good face validity, but have not been previously used to investigate these constructs with Aboriginal and Torres Strait Islander people. While these results paint a broad, representative picture of general health knowledge, concern and influence on quitting among Aboriginal and Torres Strait Islander people, more detailed assessments of knowledge may identify other gaps to target in future health information campaigns.

In conclusion, this national study found that lack of basic knowledge about the health consequences of smoking is not an important barrier to wanting and attempting to quit for Aboriginal and Torres Strait Islander smokers. Framing new messages in ways that encompass the health of others is likely to contribute to goal setting and prioritisation of quitting.

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1 Ng M, Freeman MK, Fleming TD, et al. Smoking prevalence and cigarette

consumption in 187 countries, 1980-2012. *JAMA* 2014; 311: 183-192.

2 US Department of Health and Human Services. The health consequences of smoking — 50 years of progress. A report of the Surgeon General. Atlanta: US Department of Health and Human Services, 2014.

3 Winstanley M, White V (updated by Germain D, Zacher M). Trends in the prevalence of smoking. In: Scollo MM, Winstanley MH, editors. Tobacco in Australia: facts and issues. 4th ed. Melbourne: Cancer Council Victoria, 2012. http://www.tobaccoinaustralia.org.au/chapter-1-prevalence (accessed Feb 2015).

4 Finney Rutten LJ, Augustson EM, Moser RP, et al. Smoking knowledge and behavior in the United States: sociodemographic, smoking status, and geographic patterns. *Nicotine Tob Res* 2008; 10: 1559-1570.

5 Siahpush M, McNeill A, Hammond D, Fong GT. Socioeconomic and country variations in knowledge of health risks of tobacco smoking and toxic constituents of smoke: results from the 2002 International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006; 15 Suppl 3: iii65-iii70.

6 Australian Bureau of Statistics. Australian Health Survey: updated results, 2011–2012. Canberra: ABS, 2013. (ABS Cat. No. 4364.0.55.003.)

7 Australian Bureau of Statistics. Australian Aboriginal and Torres Strait Islander Health Survey: updated results, 2012–13. Canberra: ABS, 2014. (ABS Cat. No. 4727.0.55.006.)

8 Council of Australian Governments. National Partnership Agreement on closing the gap in Indigenous health outcomes: implementation plan. Canberra: Commonwealth of Australia, 2009.

9 Calma T. Tackling Indigenous smoking. *Of Substance: The National Magazine on Alcohol, Tobacco and Other Drugs* 2011; 9 (2): 28-29.

10 Briggs VL, Lindorff KJ, Ivers RG. Aboriginal and Torres Strait Islander Australians and tobacco. *Tob Control* 2003; 12 Suppl 2: ii5-ii8.

11 Ivers RG, Castro A, Parfitt D, et al. Evaluation of a multi-component community tobacco intervention in three remote Australian Aboriginal communities. *Aust N Z J Public Health* 2006; 30: 132-136.

12 Lindorff KJ. Tobacco: time for action. National Aboriginal and Torres Strait Islander Tobacco Control Project. Final report. Canberra: National Aboriginal Community Controlled Health Organisation, 2002.

13 Robertson J, Pointing BS, Stevenson L, Clough AR. "We made the rule, we have to stick to it": towards effective management of environmental tobacco smoke in remote Australian Aboriginal communities. *Int J Environ Res Public Health* 2013; 10: 4944-4966.

14 Gould GS, Munn J, Watters T, et al. Knowledge and views about maternal tobacco smoking and barriers for cessation in Aboriginal and Torres Strait Islanders: a systematic review and meta-ethnography. *Nicotine Tob Res* 2013; 15: 863-874.

15 Johnston V, Thomas DP. Smoking behaviours in a remote Australian Indigenous community: the influence of family and other factors. *Soc Sci Med* 2008; 67: 1708-1716.

16 Hammond D, Fong GT, McNeill A, et al. Effectiveness of cigarette warning labels in informing smokers about the risks of smoking: findings from the International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006; 15 Suppl 3: iii19-iii25.

17 Borland R, Yong HH, Balmford J, et al. Motivational factors predict quit attempts but not maintenance of smoking cessation: findings from the International Tobacco Control Four country project. *Nicotine Tob Res* 2010; 12 Suppl: S4-S11.

18 Hyland A, Borland R, Li Q, et al. Individual-level predictors of cessation behaviours among participants in the International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006; 15 Suppl 3: iii83-iii94.

19 Song AV, Brown P, Glantz SA. When health policy and empirical evidence collide: the case of cigarette package warning labels and economic consumer surplus. *Am J Public Health* 2014; 104: e42-e51.

20 Slovic P. Cigarette smokers: rational actors or rational fools? In: Slovic P, editor. Smoking: risk, perception and policy. Thousand Oaks, Calif: Sage Publications, 2001: 97-124.

21 Oakes W, Chapman S, Borland R, et al. "Bulletproof skeptics in life's jungle": which self-exempting beliefs about smoking most predict lack of progression towards quitting? *Prev Med* 2004; 39: 776-782.

22 Borland R, Yong HH, Balmford J, et al. Do risk-minimizing beliefs about smoking inhibit quitting? Findings from the International Tobacco Control (ITC) Four-Country Survey. *Prev Med* 2009; 49: 219-223.

23 Gould GS, Munn J, Avuri S, et al. "Nobody smokes in the house if there's a new baby in it": Aboriginal perspectives on tobacco smoking in pregnancy and in the household in regional NSW Australia. *Women Birth* 2013; 26: 246-253.

24 Senior K, Chenhall R. Health beliefs and behavior: the practicalities of "looking after yourself" in an Australian Aboriginal community. *Med Anthropol Q* 2013; 27: 155-174.

25 Thomas DP, Briggs VL, Couzos S, et al. Research methods of Talking About The Smokes: an International Tobacco Control Policy Evaluation Project study with Aboriginal and Torres Strait Islander Australians. *Med J Aust* 2015; 202 (10 Suppl): S5-S12.

26 Couzos S, Nicholson AK, Hunt JM, et al. Talking About The Smokes: a large-scale, community-based participatory research project. *Med J Aust* 2015; 202 (10 Suppl): S13-S19.

27 StataCorp. Stata survey data reference manual: release 13. College Station, Tex: Stata Press, 2013. http://www.stata.com/manuals13/svy.pdf (accessed Sep 2014).

28 Hyland A, Higbee C, Borland R, et al. Attitudes and beliefs about secondhand smoke and smoke-free policies in four countries: findings from the International Tobacco Control Four Country Survey. *Nicotine Tob Res* 2009; 11: 642-649.

29 Minges KE, Zimmet P, Magliano DJ, et al. Diabetes prevalence and determinants in Indigenous Australian populations: a systematic review. *Diabetes Res Clin Pract* 2011; 93: 139-149.

30 Passey ME, D'Este CA, Stirling JM, Sanson-Fisher RW. Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions. *Drug Alcohol Rev* 2012; 31: 608-616.

31 Miller CL, Quester PG, Hill DJ, Hiller JE. Smokers' recall of Australian graphic cigarette packet warnings & awareness of associated health effects, 2005-2008. *BMC Public Health* 2011; 11: 238.

32 Australian Institute of Health and Welfare. Substance use among Aboriginal and Torres Strait Islander people. Canberra: AIHW, 2011. (AIHW Cat. No. IHW 40.)

33 Costello MJ, Logel C, Fong GT, et al. Perceived risk and quitting behaviors: results from the ITC 4-country survey. *Am J Health Behav* 2012; 36: 681-692.

34 Wood L, France K, Hunt K, et al. Indigenous women and smoking during pregnancy: knowledge, cultural contexts and barriers to cessation. *Soc Sci Med* 2008; 66: 2378-2389.

35 DiGiacomo M, Davidson PM, Davison J, et al. Stressful life events, resources, and access: key considerations in quitting smoking at an Aboriginal Medical Service. *Aust N Z J Public Health* 2007; 31: 174-176.

36 Ivers R. Anti-tobacco programs for Aboriginal and Torres Strait Islander people. Produced for the Closing the Gap Clearinghouse. Canberra: Australian Institute of Health and Welfare; and Melbourne: Australian Institute of Family Studies, 2011.

37 Thomson G, Wilson N, Weerasekera D, Edwards R. Strong smoker interest in 'setting an example to children' by quitting: national survey data. *Aust N Z J Public Health* 2011; 35: 81-84.

38 National Aboriginal Health Strategy Working Group. A National Aboriginal Health Strategy. Canberra: Australian Government, 1989.

39 Australian Government Department of Health. 'Break the Chain' quantitative campaign effectiveness: research — executive summary October 2011. Canberra: Commonwealth of Australia, 2013. http://www.quitnow.gov.au/internet/quitnow/publishing.nsf/Content/btc-indsurvey-execsumm (accessed Feb 2015).

40 Steil AK, Lorenzo L, Sydeman SJ. Demographic variables are associated with knowledge, attitudes, and preventive behaviors related to environmental tobacco smoke. *Nicotine Tob Res* 2010; 12: 674-678.

41 Weinstein ND. What does it mean to understand a risk? Evaluating risk comprehension. *J Natl Cancer Inst Monogr* 1999; 25: 15-20.

42 International Agency for Research on Cancer. IARC handbooks of cancer prevention: tobacco control. Volume 12. Methods for evaluating tobacco control policies. Lyon: IARC, 2008. ■