Dependence in a national sample of Aboriginal and Torres Strait Islander daily smokers

Abstract

Objectives: To examine indicators of nicotine dependence in a national sample of Aboriginal and Torres Strait Islander daily smokers and their association with sustaining a quit attempt for at least 1 month, and to make comparisons with a national sample of Australian daily smokers.

Design, setting and participants: The Talking About The Smokes project used a quota sampling design to recruit 1392 daily smokers from communities served by 34 Aboriginal community-controlled health services and one community in the Torres Strait from April 2012 to October 2013. These were compared with 1010 daily smokers from the general Australian population surveyed by the International Tobacco Control Policy Evaluation Project from September 2011 to February 2012.

Main outcome measures: Cigarettes per day (CPD), time to first cigarette, Heaviness of Smoking Index (HSI), other indicators of dependence, and whether smokers had ever sustained a quit attempt for at least 1 month.

Results: There was little difference in the mean HSI scores for Aboriginal and Torres Strait Islander and other Australian daily smokers. A higher proportion of Aboriginal and Torres Strait Islander daily smokers smoked ⩽10 CPD (40% v 33.4%), but more also smoked their first cigarette within 30 minutes of waking (75% v 64.6%). Lower proportions of Aboriginal and Torres Strait Islander smokers reported having strong urges to smoke at least several times a day (51% v 60.7%) or that it would be very hard to quit (39% v 47.9%). Most Aboriginal and Torres Strait Islander smokers reported experiencing difficulties during their most recent quit attempt. All indicators of dependence, except CPD and strong urges, were positively associated with not having made a sustained quit attempt. Reported difficulties during the most recent quit attempt were more strongly associated with being unable to sustain quit attempts than were traditional measures of dependence.

Conclusion: Aboriginal and Torres Strait Islander smokers' experiences of past attempts to quit may be more useful than conventional indicators of nicotine dependence in understanding their dependence.

In 1988, the United States Surgeon General concluded that nicotine is the drug in tobacco that causes dependence on smoking.[1] The nicotine that is delivered to the brain when smoking interacts with the habits and sensory stimuli associated with smoking to reinforce the behaviour.[2] Genetic factors also influence the biological processes of nicotine delivery, metabolism and dependence.[2]

Clinicians and scientists have sought indicators to predict the success or failure of quit attempts, beyond indicators of motivation. The best such measure is the Heaviness of Smoking Index (HSI),[3] or at least one of its two component items: cigarettes per day (CPD) and the time to first cigarette (TTFC) after waking.[4,5] These two items are a subset of the six items in the Fagerström Test for Nicotine Dependence.[6] There is also evidence that strong cravings (both before and after quitting) and shorter periods of abstinence on past attempts may independently predict failure of quit attempts.[7-9] Identifying smokers who are most likely to have difficulty quitting is important in determining who might benefit from medications to assist cessation.

The age-standardised prevalence of smoking is 2.6 times higher among Aboriginal and Torres Strait Islander people as among other Australians.[10] While both smoking prevalence and smoking intensity (based on self-reported CPD) are falling among the Aboriginal and Torres Strait Islander population, measures of dependence may differently predict which smokers will have the most difficulty quitting in this high-prevalence population where smoking is more normalised.[10,11] Two small research reports have suggested that over-reliance on strategies that use stop-smoking medications may not be appropriate in this population, as nicotine dependence may be lower than in other populations.[12,13] One of these studies found only low per capita consumption of cigarettes in remote Aboriginal communities,[12] and the other found that only a small proportion of a sample of pregnant Aboriginal and Torres Strait Islander women who smoked were highly dependent.[13]

Here, we use a large national study of Aboriginal and Torres Strait Islander smokers to examine different indicators of dependence in this population and their association with sustained quit attempts, and to make comparisons with a national sample of Australian smokers.

Methods

The Talking About The Smokes (TATS) project surveyed 1392 Aboriginal and Torres Strait Islander daily smokers using a quota sampling design in the communities served by 34 Aboriginal community-controlled health services (ACCHSs) and one community in the Torres Strait, and has been described elsewhere.[14,15] Briefly, the 35 sites were selected based on the distribution of the Aboriginal and Torres Strait Islander population by state or territory and remoteness. In 30 sites, we aimed to interview 50 smokers or ex-smokers who had quit ⩽12 months before, and 25 non-smokers, with equal numbers of women and men and of those aged 18–34 and ⩾35 years. In four major-city sites and the Torres Strait community, the sample sizes were doubled. People were excluded if they were aged less than 18 years, not usual residents of the area, staff of the ACCHS, or deemed unable to complete the survey. In each site,

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1 Comparison of indicators of nicotine dependence among Aboriginal and Torres Strait Islander daily smokers and those in the Australian population*

Indicator of dependence	Talking About The Smokes project, % (frequency)†	Australian ITC Project, % (95% CI)‡
Cigarettes per day		
1–10	40% (547)	33.4% (27.9%–39.3%)
11–20	39% (528)	42.2% (36.8%–47.7%)
21–30	18% (242)	18.5% (14.7%–22.9%)
⩾31	4% (54)	6.0% (3.7%–9.6%)
Time to first cigarette		
More than 60 minutes	9% (125)	16.1% (11.9%–21.3%)
31–60 minutes	16% (220)	19.4% (15.3%–24.2%)
6–30 minutes	64% (884)	46.7% (41.2%–52.3%)
5 minutes or less	11% (145)	17.9% (13.6%–23.2%)
Heaviness of Smoking Index (HSI) score		
Low (0–1)	17% (234)	24.5% (19.5%–30.3%)
Moderate (2–3)	59% (796)	44.6% (39.2%–50.1%)
Heavy (4–6)	24% (328)	30.9% (25.8%–36.5%)
How often do you get strong urges to smoke?		
Never or less than daily	21% (291)	12.4% (9.0%–16.9%)
Daily	27% (375)	26.9% (21.9%–32.5%)
Several times a day or more often	51% (706)	60.7% (54.9%–66.2%)
How easy or hard would it be for you to quit?		
Very or somewhat easy	17% (234)	10.4% (6.9%–15.4%)
Neither easy nor hard	11% (156)	7.9% (5.0%–12.2%)
A little bit hard	32% (439)	33.7% (28.8%–39.0%)
Very hard	39% (537)	47.9% (42.3%–53.6%)

ITC Project = International Tobacco Control Policy Evaluation Project. *Percentages and frequencies exclude refused responses and "don't know" responses. †Results are for Aboriginal and Torres Strait Islander daily smokers (n = 1392) in the baseline sample of the Talking About The Smokes project (April 2012 – October 2013). ‡Results are for daily smokers (n = 1010) in the Australian population from Wave 8.5 of the Australian ITC Project (September 2011 – February 2012) and were age- and sex-standardised to smokers in the 2008 National Aboriginal and Torres Strait Islander Social Survey. ◆

different locally determined methods were used to collect a representative, although not random, sample.

Baseline data were collected from April 2012 to October 2013. 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 was completed on a computer tablet and took 30–60 minutes. The baseline sample closely matched the national distribution of age, sex, jurisdiction, remoteness, quit attempts in the past year and number of daily cigarettes smoked reported in the 2008 National Aboriginal and Torres Strait Islander Social Survey (NATSISS). 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.[14]

The TATS project is part of the International Tobacco Control Policy Evaluation Project (ITC Project) collaboration. Interview questions were closely based on those in ITC Project surveys, especially the Australian surveys.[16] TATS project results were compared with those for 1010 daily smokers surveyed in Wave 8.5 of the Australian ITC Project between September 2011 and February 2012. That survey was completed by random digit telephone dialling or on the internet, and included smokers contacted for the first time and those who were recontacted after completing surveys in previous waves.

We asked questions about daily smokers' usual smoking behaviour and variations in tobacco consumption, how easy it would be to not smoke, difficulties during their most recent quit attempt (eg, strong cravings, being around others who smoke), the duration of their longest quit attempt (to assess if any attempt had been sustained for at least 1 month) and sociodemographic factors. The questions are described in detail in Appendix 1.

The HSI was coded 0 to 6 based on the sum of the responses to the two questions about CPD and TTFC. These items were each coded as 0 (0–10 CPD; TTFC, ⩾61 min), 1 (11–20 CPD; TTFC, 31–60 min), 2 (21–30 CPD; TTFC, 6–30 min) or 3 (⩾31 CPD; TTFC, ⩽5 min).[3] We categorised HSI as low (0–1), moderate (2–3) or high (4–6).[17,18] We also assessed the three criteria for dependence given in the Royal Australian College of General Practitioners (RACGP) cessation guidelines: TTFC ⩽30 min, >10 CPD, and withdrawal symptoms on previous quit attempts (defined in our sample as strong cravings during the most recent quit attempt).[2]

The project was approved by three Aboriginal human research ethics committees (HRECs) and two HRECs with Aboriginal subcommittees: Aboriginal Health & Medical Research Council Ethics Committee, Sydney; Aboriginal Health Research Ethics Committee, Adelaide; Central Australian HREC, Alice Springs; HREC for the Northern Territory Department of Health and Menzies School of Health Research, Darwin; and the Western Australian Aboriginal Health Ethics Committee, Perth.

Statistical analyses

We calculated the percentages and frequencies of responses to the TATS project questions, but did not include confidence intervals for these as it is not considered statistically acceptable to estimate sampling error in non-probabilistic samples. Therefore, we could not assess the statistical significance of differences with the Australian ITC Project results. The results for daily smokers in the Australian ITC Project were directly standardised to the distribution of age and sex of Aboriginal and Torres Strait Islander smokers reported in the 2008 NATSISS.

Within the TATS project sample, we assessed the association between sociodemographic variables and HSI using χ^2 tests adjusted for the sampling design, using the 35 sites as clusters and the age–sex quotas as strata in Stata 13 (StataCorp) survey [SVY] commands.[19] We assessed the association between indicators of dependence and sustained quit attempts using simple logistic regression, with confidence intervals adjusted for the sampling design and *P* values calculated for each variable using adjusted Wald tests.

Reported percentages and frequencies exclude those refusing to answer, answering "don't know", or for whom the question was not applicable (eg, questions about the most recent quit attempt excluded those who had not made an attempt in the past 5 years). Less than 2% of daily smokers answered "don't know" or refused to answer each of the questions analysed here, except that 18 smokers (2.0%) answered "don't know" to the question about difficulty in saying no when offered a cigarette during their most recent quit attempt, and 32 (2.3%) refused to answer the question about being unable to afford to buy cigarettes.

Results

There was little difference in the mean HSI scores for daily smokers in the TATS project compared with those in the Australian ITC Project (2.62 v 2.64; 95% CI, 2.45–2.83), but the TATS sample had fewer low and high scores and more moderate scores (Box 1). A higher proportion of smokers in the TATS project smoked 10 or fewer cigarettes per day (40% v 33.4%), but more also smoked their first cigarette within 30 minutes of waking (75% v 64.6%; 95% CI, 58.8%–70.0%). Lower proportions of Aboriginal and Torres Strait Islander smokers reported having strong urges to smoke at least several times a day (51% v 60.7%) or that it would be very hard to quit (39% v 47.9%).

Within the TATS sample, older smokers were more likely to have higher HSI scores, as were smokers who were not in the labour force, those with less education, those from both the most and least disadvantaged areas, and Aboriginal smokers compared with Torres Strait Islander smokers (Box 2).

Box 3 presents the results for questions that were only asked in the TATS project. Nearly half the smokers (47%) reported finding it very or extremely hard to go without smoking for a whole day, and most reported experiencing difficulties during their most recent quit attempt. A quarter (24%) of daily smokers had all three of the RACGP indicators of dependence.

Among the 61% of smokers in the TATS sample (833/1371) who had made a quit attempt in the past 5 years, all the indicators of dependence, except CPD and strong urges, were associated with being less likely to have made a sustained quit attempt of at least 1 month (Box 4). The indicators with the strongest negative associations with making a sustained quit attempt were the smokers' assessments of how hard it would be to quit and their difficulties during the most recent quit attempt. Although the HSI and the

2 Heaviness of Smoking Index among Aboriginal and Torres Strait Islander daily smokers, by sociodemographic factors (n = 1392)*

Characteristic	Heaviness of Smoking Index score			*P*†
	Low, % (frequency)	Moderate, % (frequency)	High, % (frequency)	
Total daily smokers	17% (234)	59% (796)	24% (328)	
Age (years)				< 0.001
18–24	22% (60)	68% (187)	11% (29)	
25–34	21% (76)	57% (209)	23% (84)	
35–44	14% (45)	58% (186)	28% (92)	
45–54	16% (37)	56% (132)	28% (67)	
⩾ 55	10% (16)	53% (82)	36% (56)	
Sex				0.12
Female	19% (134)	59% (417)	22% (153)	
Male	15% (100)	58% (379)	27% (175)	
Indigenous status				0.027
Aboriginal	16% (195)	59% (717)	25% (297)	
Torres Strait Islander or both	26% (39)	53% (79)	21% (31)	
Labour force status				< 0.001
Employed	21% (101)	58% (274)	21% (97)	
Unemployed	18% (82)	63% (293)	19% (89)	
Not in labour force	12% (51)	54% (227)	34% (142)	
Highest education attained				0.036
Less than Year 12	14% (101)	59% (411)	27% (188)	
Finished Year 12	19% (68)	58% (204)	23% (80)	
Post-school qualification	22% (63)	59% (172)	20% (57)	
Treated unfairly because Indigenous in past year				0.72
Never	18% (106)	57% (335)	25% (145)	
At least some of the time	17% (124)	59% (439)	24% (176)	
Remoteness				0.34
Major cities	15% (52)	60% (214)	25% (88)	
Inner and outer regional	19% (137)	59% (420)	22% (158)	
Remote and very remote	16% (45)	56% (162)	28% (82)	
Area-level disadvantage				0.027
1st quintile (most disadvantaged)	16% (83)	57% (290)	27% (137)	
2nd and 3rd quintiles	21% (121)	59% (342)	21% (121)	
4th and 5th quintiles	11% (30)	62% (164)	27% (70)	

* Percentages and frequencies exclude those answering "don't know" or refusing to answer. † *P* values were calculated using the χ^2 test adjusted for sampling design. ◆

3 Other indicators of nicotine dependence and difficulties during the most recent quit attempt among Aboriginal and Torres Strait Islander daily smokers

Indicator of dependence	Daily smokers, % (frequency)*
All daily smokers (*n*)	1392
RACGP criteria for dependence†	
None	12% (162)
One	24% (334)
Two	41% (564)
All three	24% (327)
How hard is it to go without smoking for a whole day?	
Not at all or somewhat hard	47% (654)
Very or extremely hard	47% (657)
Not sure or never tried	6% (79)
If tried to quit in the past 5 years (*n*)	884
During last quit attempt	
Had strong cravings	70% (591)
Hard to be around smokers	72% (621)
Hard to say no when offered a smoke	67% (572)
Missed the time out you get when having a smoke	51% (430)

RACGP = Royal Australian College of General Practitioners. * Percentages and frequencies exclude those answering "don't know" or refusing to answer. † Time to first cigarette ≤ 30 min, > 10 cigarettes per day, and withdrawal symptoms on previous quit attempts (strong cravings during most recent quit attempt). ◆

RACGP criteria of dependence were negatively predictive of making a sustained quit attempt, CPD — one of their component measures — was not.

Nearly half the daily smokers in the TATS sample (45%, 606/1354) reported being unable to buy cigarettes for at least a few days in each fortnight before pay day, and 23% (314/1354) less often, while for 32% (435/1354) this was never a problem. When smokers were unable to buy them, 37% (342/916) reported they were often or very often given cigarettes, and 50% (460/916) were sometimes given them. As a result, 27% (245/911) said they smoked the same amount as usual when unable to buy cigarettes, while 50% (456/911) smoked a bit less and only 23% (210/911) smoked a lot less or not at all.

Compared with Australian smokers in the ITC Project, fewer Aboriginal and Torres Strait Islander smokers in the TATS project reported that the amount they smoked varied from day to day (42% [580/1392] v 58.5% [95% CI, 53.1%–63.7%]), but more reported that spending money on cigarettes left them with insufficient money for food or other essentials (23% [321/1378] v 12.9% [95% CI, 8.7%–18.6%]).

The Aboriginal and Torres Strait Islander smokers whose smoking led to insufficient money for essentials were less likely to have made sustained attempts to quit (odds ratio [OR], 0.70; 95% CI, 0.37–0.71; $P < 0.001$). Smokers who were never unable to afford cigarettes were less likely to have made a sustained quit attempt than those who were sometimes unable to buy them (OR, 0.51; 95% CI, 0.37–0.71; $P < 0.001$). Those who said they smoked about the same as usual when they were unable to buy cigarettes were also less likely to have made a sustained quit attempt, compared with those who at such times smoked a lot less or not at all (OR, 0.61; 95% CI, 0.41–0.91; $P = 0.01$).

Discussion

We found mixed relationships between indicators for dependence and sustained quit attempts in our sample of Aboriginal and Torres Strait Islander smokers. Based on CPD, frequency of strong urges to smoke and perceptions of how hard it would be to quit, dependence in this population appeared lower than among all Australian smokers. In contrast, our sample had a shorter TTFC. Nevertheless, the associations we found between dependence, as measured by the HSI, and being older and socially disadvantaged were similar to those in previous cross-sectional Australian ITC Project research.[20]

Previous research suggests TTFC is a more useful measure of dependence and a better predictor of successful quitting than CPD, although both are predictive and may contribute independently.[4,5,21,22] Consistent with this, we found that longer TTFC was associated with having made a sustained quit attempt, while CPD was not. However, we also found no association for the frequency of strong urges while still smoking, which has been shown to be associated with successful quitting in longitudinal research, performing better than the Fagerström Test for Nicotine Dependence or its components, HSI, TTFC or CPD.[7,8] These findings question the utility of existing indicators of dependence to predict successful quitting in Aboriginal and Torres Strait Islander smokers.

Aboriginal and Torres Strait Islander smokers' perceptions of greater ease in quitting (quitting self-efficacy) may be falsely optimistic, perhaps reflecting less experience of unsuccessful quit attempts.[23] In 2012–2013, only 37% of Aboriginal and Torres Strait Islander adults who had ever smoked had successfully quit, compared with 63% of other Australians.[10] Some of the cross-sectional association we found between quitting self-efficacy and sustained quit attempts is likely to be in the reverse direction, with those who have not been able to sustain quit attempts understandably reporting that quitting will be harder. However, in other longitudinal research of the ITC Project, quitting self-efficacy has been associated with preventing relapses, both before and after a month.[7] Nevertheless, we can take advantage of this optimism to encourage quit attempts.

Most Aboriginal and Torres Strait Islander smokers reported withdrawal symptoms (cravings) and situational difficulties during their most recent quit attempt, which have been described in more detail in previous qualitative research.[24] It is notable that questions about the most recent quit attempt were consistently stronger predictors of being unable to sustain quit attempts than were traditional measures of dependence based on typical daily smoking patterns. Our results are consistent with more detailed recent research in other settings, which suggested that the components of the HSI are only predictive of early relapses in the first weeks of a quit attempt, whereas cravings and situational cues (such as the number of close friends who smoke) are important after 1 month.[7,25]

Current clinical guidelines recommend that clinicians ask smokers not only about CPD and TTFC, but also about their past unsuccessful quit attempts.[26,27] Beyond emphasising

the utility of the existing question about difficulties experienced during past attempts, we recommend waiting for further research on how the different measures prospectively predict quitting success before suggesting changes to the guidelines for Aboriginal and Torres Strait Islander smokers.

It is possible that estimates of CPD might be less accurate among Aboriginal and Torres Strait Islander smokers, where the relationship between purchase and consumption is more complicated because sharing and being unable to buy cigarettes are common. Two small studies of Aboriginal and Torres Strait Islander people showed that self-reported CPD is associated with urinary cotinine levels, but did not discuss whether the association was similar to that in other populations.[28,29] However, we found that Aboriginal and Torres Strait Islander smokers were less likely than all Australian smokers to report variation in the number of cigarettes smoked each day, so it is difficult to suggest that such day-to-day variations are the reason for CPD being less useful in this setting. Those who managed to maintain usual consumption levels when they were unable to buy cigarettes were less likely to have sustained a quit attempt than those who smoked less at these times. Sharing of cigarettes therefore seems to increase in response to the inability to buy cigarettes among more dependent smokers, as has been reported elsewhere in response to pay cycles and the increased cost of cigarettes after tobacco excise rises.[24,30]

Strengths and limitations

The main strength of our study is its large national sample of Aboriginal and Torres Strait Islander smokers, providing detailed information about dependence directly from a population with a high prevalence of smoking. However, it is a non-random, albeit broadly representative, sample and caution is needed in making comparisons with the Australian ITC Project sample.

The cross-sectional associations we found warrant confirmation from

4 Association of indicators of dependence with sustaining a quit attempt for at least 1 month in a national sample of Aboriginal and Torres Strait Islander daily smokers*

Indicator of dependence	Sustained quit attempt, % (frequency)†	Odds ratio (95% CI)‡	P§
Total	47% (388)		
Heaviness of Smoking Index score			0.046
Low (0–1)	50% (71)	1.0	
Moderate (2–3)	48% (238)	0.91 (0.66–1.26)	
Heavy (4–6)	38% (68)	0.60 (0.39–0.91)	
RACGP criteria for dependence			0.001
None	54% (38)	1.0	
One	57% (92)	1.12 (0.60–2.09)	
Two	47% (133)	0.73 (0.43–1.24)	
All three	39% (124)	0.55 (0.33–0.90)	
Cigarettes per day			0.19
1–10	47% (153)	1.0	
11–20	48% (163)	1.02 (0.75–1.38)	
21–30	45% (57)	0.89 (0.58–1.37)	
⩾ 31	27% (9)	0.42 (0.18–0.94)	
Time to first cigarette			0.024
More than 60 minutes	53% (43)	1.0	
31–60 minutes	55% (73)	1.08 (0.57–2.03)	
6–30 minutes	45% (235)	0.72 (0.45–1.13)	
5 minutes or less	36% (31)	0.51 (0.27–0.94)	
How often do you get strong urges to smoke?			0.49
Never or less than daily	49% (90)	1.0	
Daily	47% (109)	0.91 (0.61–1.38)	
Several times a day or more often	45% (184)	0.82 (0.58–1.17)	
How hard is it to go without smoking for a whole day?			0.01
Not at all or somewhat hard	51% (219)	1.0	
Very or extremely hard	42% (159)	0.69 (0.52–0.92)	
Not sure or never tried	33% (9)	0.47 (0.22–1.05)	
How easy or hard would it be for you to quit?			< 0.001
Very or somewhat easy	61% (94)	1.0	
Neither easy nor hard	53% (46)	0.72 (0.42–1.25)	
A little bit hard	46% (125)	0.53 (0.36–0.78)	
Very hard	38% (120)	0.39 (0.27–0.56)	
During most recent quit attempt			
Did you get strong cravings?			< 0.001
No	59% (149)	1.0	
Yes	42% (236)	0.49 (0.37–0.66)	
Was it hard to be around smokers?			< 0.001
No	59% (133)	1.0	
Yes	42% (252)	0.51 (0.38–0.69)	
Was it hard to say no when offered a smoke?			< 0.001
No	58% (154)	1.0	
Yes	41% (225)	0.50 (0.35–0.70)	
Did you miss the time out you get when having a smoke?			0.03
No	51% (197)	1.0	
Yes	44% (179)	0.74 (0.56–0.98)	

RACGP = Royal Australian College of General Practitioners. * Results are based on daily smokers in the baseline sample of the Talking About The Smokes project who had made at least one quit attempt in the past 5 years ($n = 833$). † Percentages and frequencies exclude those answering "don't know" or refusing to answer. ‡ Odds ratios calculated using simple logistic regression adjusted for the sampling design. § P values for the entire variable, using adjusted Wald tests. ◆

future longitudinal analyses. There may have been some reverse causation, with past experiences of sustaining or not sustaining quit attempts influencing answers to the questions about dependence. Further, sustained attempts may have occurred years earlier, and the smokers' dependence may have since changed. The use of past sustained quit attempts as an outcome necessarily meant excluding those who had not made any attempts. Predicting future quitting in this subgroup will be important but cannot include measures based on non-existent past attempts.

Our self-reported data are probably limited by incomplete recall of past quit attempts, and both forgetting and misremembering of symptoms. The effect of most of these biases will be to weaken reported associations, leading to greater confidence in the significant associations but requiring caution in the implications of findings of no association. For example, the lack of association of strong urges to smoke with sustained quitting found here, in contrast to other research, requires further exploration.[8] More Aboriginal smokers than other Australian smokers use roll-your-own cigarettes, which may have caused greater misclassification bias of estimates of CPD.[31] Future longitudinal analyses of the predictive association of these dependence measures with relapses and successful quitting should also control for the moderating effect of stop-smoking medication, which we were not able to do.[25]

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