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Rural smokers

A prevention opportunity

Background

Smoking is the largest single cause of preventable death and disease in Australia. This study describes smoking prevalence and the characteristics of rural smokers to guide general practitioners in targeting particular groups.

Methods

Cross sectional surveys in the Greater Green Triangle region of southeast Australia using a random population sample (n=1563, participation rate 48.7%) aged 25–74 years. Smoking information was assessed by a self administered questionnaire.

Results

Complete smoking data were available for 1494 participants. Overall age adjusted current smoking prevalence was 14.9% (95% CI: 13.1–16.7). In both genders, current smoking prevalence decreased with age. Those aged 25–44 years were more likely to want to stop smoking and to have attempted cessation, but less likely to have received cessation advice than older smokers.

Discussion

This study provides baseline smoking data for rural health monitoring and identifies intervention opportunities. General practice is suited to implement interventions for smoking prevention and cessation at every patient encounter, particularly in younger individuals.

■ **Tobacco smoking, a major risk factor for coronary heart disease, stroke, peripheral vascular disease, cancer and other diseases,¹ is estimated to cost the Australian community \$31.5 billion per annum,² and was responsible for more than 15 500 Australian deaths in 2003.³**

Overall, Australian smoking rates have declined since the 1950s, with daily smoking among patients aged 18 years and over declining from 19.2% in 1998–1999 to 16.1% in 2006–2007.⁴ However, in 2008 an estimated one in 6 Australians aged 14 years and over smoked daily (around 2.9 million) and altogether 19.4% currently smoked.⁵ More men (18.0%) than women (15.2%) smoked daily. Former smokers, 25.1% of the population (men 27.9%, women 22.4%), outnumbered smokers; 55.4% had never smoked (men 50.9%, women 59.8%).

Previous Australian population studies assessing smoking status were primarily urban with little comparable rural data.^{5–7} This study describes smoking prevalence and characteristics of rural smokers to guide general practitioners in targeting particular groups.

Methods

Participants

Three cross sectional population surveys of chronic disease risk factors and related health behaviour were conducted in the Greater Green Triangle (GGT) region of southeast Australia⁸ between October 2004 and October 2006 in Limestone Coast (LC), Corangamite Shire (CO) and Wimmera (WI). These regions are predominantly classified as 'other rural areas' by the Rural, Remote and Metropolitan Areas (RRMA) classification.⁹ The population was predominately Anglo-Celtic with very few Aboriginal people or Torres Strait Islanders, or those of other ethnic origins.

A random sample, stratified by gender and age, was selected from the electoral role of the three survey regions. Individuals who died or had left the region were excluded. The number of individuals in this final sample was 1563; 552 in LC, 415 in CO and 596 in WI. An invitation to participate was sent by mail to each individual. If they agreed they were asked to complete a written consent form and were

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sent a self administered questionnaire and invitation to present for a health check.

Participants gave written consent to participate. The study was approved by the Flinders University Clinical Research Ethics Committee.

Measures

The survey methodology comprised self administered questionnaires, physical measurements and venous blood sampling.¹⁰ The questionnaire and health check invitations were mailed to selected participants. Based on structured questions assessing smoking history, participants were classified into the following categories:

- daily smoker: smoked regularly (daily or almost daily) for at least 1 year and smoked yesterday or today
- occasional smoker: smoked on at least 100 occasions in their lifetime and smoked during the previous month
- ex-smoker: smoked daily or occasionally but not during the previous month
- never smoker: smoked on less than 100 occasions in their lifetime.

Furthermore, daily and occasional smokers were grouped as current smokers, and questioned on concern about smoking, willingness to quit, previous quitting attempts and quitting advice received.⁸

Education tertiles were defined according to years of full time education, and separately classified as low, medium, or high for each age stratum. This allowed comparison between smoking and level of education without biasing by obvious age/education correlation.

Statistical analyses

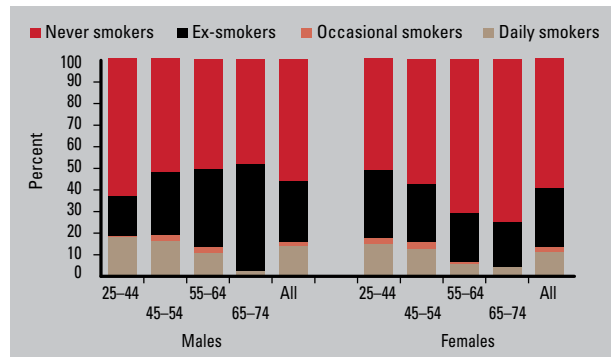
Statistical analyses were undertaken using SPSS version 14.0. Age specific and overall prevalence figures are presented. Overall prevalence was adjusted for age using population weights derived from the region's population according to the electoral roll.

Results

The participation rate was 48.7%. Complete smoking data were available for 1494 participants. Overall current smoking prevalence was 14.9% (95% CI: 13.1–16.7), slightly higher in men (16.2%, 13.5–19.0) than women (13.8%, 11.4–16.2) (*Figure 1*). In both genders, current smoking prevalence decreased with age. More than half the participants were never smokers and almost one-third were ex-smokers. Smoking habits were similar across the three areas.

Approximately 90% of current smokers were somewhat or very concerned about smoking (*Table 1*), consistent across areas and genders. Over 60% indicated a desire to stop, particularly younger participants. In the older age groups, most of those who had ever

Figure 1. Prevalence of smoking in the GGT region by age and gender



smoked were already ex-smokers (*Figure 1*). Almost half of current smokers had attempted cessation in the previous year (*Table 1*). Only 4% in the 25–44 years age group had never tried to stop compared with one-quarter in older age groups.

In the previous year, three-quarters of current smokers were advised to stop (*Table 2*). Although 87% of current smokers reported visiting a GP in the previous year, only one-third reported advice from a doctor, increasing from 30% of youngest to 60% of oldest smokers. One-fifth was advised to stop by another health professional and two-thirds by a family member, ranging from half of the oldest to three-quarters of the youngest.

Compared with the highest tertile, persons with low education were three times more likely to smoke (*Figure 2*). The association between smoking and education weakened with increasing age, with no differences found in the oldest age group.

Discussion

We believe this is the first study presenting smoking data exclusively for rural Australian adults. Although participation rate was modest (48.7%), a comparison of socioeconomic characteristics of survey participants with population statistics available indicated that participants closely represented the true populations of the areas.¹¹

Our study differs from other Australian surveys, not only by the population sampled, but by the different definitions and age groups for smoking status and different methodologies. In particular, other population surveys sampled individuals less than 25 years of age in whom smoking rates were high. Omitting individuals aged 18–24 years from our study may contribute to a lower estimate of overall smoking prevalence. This difference needs to be recognised when comparing studies. Studies for comparison include the 2004–2005 National Health Survey (NHS),⁶ the 2006 Victorian Population Health Survey (VPHS),⁷ and the 2007 National Drug Strategy Household Survey (NDSHS).⁵

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Overall smoking rates in these studies were 23.0%, 20.5% and 19.4% respectively. Smoking rates for men ranged from 26.2% (NHS) to 21.1% (NDSHS) and women from 20.4% (NHS) to 17.7% (NDSHS). Prevalence of current smoking in the GGT region for participants aged 25–74 years appears lower overall (14.9%), and in both genders (men 16.2%, women 13.8%). In all studies smoking decreased with age.^{5–7}

This study also highlights concerns and attitudes of current smokers, previous attempts to stop, and cessation advice received. The finding that most smokers, including younger ones, would like and do attempt to stop smoking is consistent with earlier studies from other countries.^{12,13} Therefore, it is likely applicable to other rural and urban areas in Australia.

Strategies for smoking prevention and cessation should be targeted at all people. Specific issues for culturally and linguistically diverse (CALD) and indigenous groups may need consideration. Our findings suggest younger individuals should be targeted more aggressively. As very few individuals first start smoking after 21 years of age, focusing on deterring smoking initiation in young people is the best strategy.^{14,15} At every opportunity GPs should attempt this. Older groups, particularly those aged over 65 years, already seem to have a large number of ex-smokers. Most participants were concerned about harmful

consequences of smoking but for one-third of current smokers this did not translate into a desire to stop. Only 30% of current smokers in the youngest age group who saw a GP in the previous 12 months reported cessation advice. Similarly, only 14% of this age group who saw another health professional reported cessation advice. This youngest group was most likely to want to stop smoking or attempt cessation, but least likely to receive cessation advice from a GP or other health professional. This highlights an important opportunity for GPs and other health professionals to assist a motivated group to stop smoking.

Although the study considers the 25–44 year age group as one stratum, post hoc analyses comparing participants aged 25–34 years with those aged 35–44 years were conducted. Although small sample size limits comparisons, the only difference was desire to stop, which was significantly higher in the 35–44 years age group (81.8 vs. 50.7%).

Advice, even brief, from GPs has significant positive effects on smoking cessation rates.¹⁶ An increasing proportion of GP encounters are with older patients, including ‘baby boomers’ currently aged 45–64 years.⁴ While this may contribute to increased delivery of smoking advice in these age groups, GPs may be missing opportunities to address smoking with younger people.

Despite declining smoking rates, smoking remains the largest cause

Table 1. Concerns and attitudes to smoking cessation in daily and occasional smokers in the GGT region by age, as % (95% CI)

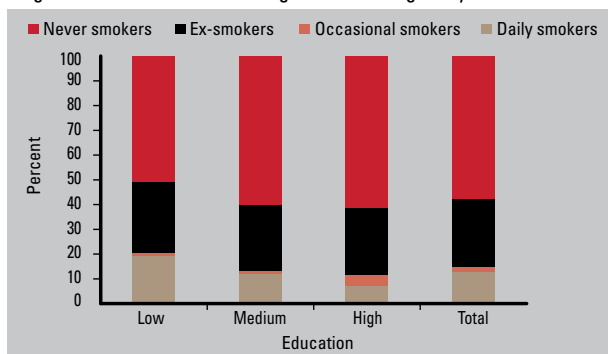
| | 25–44 years n=51 | 45–54 years n=70 | 55–64 years n=42 | 65–74 years n=16 | All n=179 |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|-------------------|
| Concern | | | | | |
| Very concerned | 45.1 (31.4, 58.8) | 42.9 (31.3, 54.5) | 38.1 (23.4, 52.8) | 31.2 (8.5, 54.0) | 42.1 (35.6, 48.5) |
| Somewhat concerned | 47.1 (33.4, 60.8) | 42.9 (31.3, 54.5) | 52.4 (37.3, 67.5) | 37.5 (13.8, 61.2) | 47.4 (40.8, 53.9) |
| Not much concerned | 7.8 (0.5, 15.2) | 14.3 (6.1, 22.5) | 7.1 (0.0, 14.9) | 25.0 (3.8, 46.2) | 10.0 (6.1, 13.9) |
| Not at all concerned | – | – | 2.4 (0.0, 7.0) | 6.2 (0.0, 18.1) | 0.6 (0.0, 1.6) |
| Total | 100% | 100% | 100% | 100% | 100% |
| Like to stop | | | | | |
| No | 5.9 (0.0, 12.3) | 10.0 (3.0, 17.0) | 9.5 (0.6, 18.4) | 31.2 (8.5, 54.0) | 9.2 (5.4, 13.0) |
| Yes | 72.5 (60.3, 84.8) | 64.3 (53.1, 75.5) | 64.3 (49.8, 78.8) | 43.8 (19.4, 68.1) | 64.9 (58.6, 71.1) |
| I am not sure | 17.6 (7.2, 28.1) | 20.0 (10.6, 29.4) | 21.4 (9.0, 33.8) | 25.0 (3.8, 46.2) | 21.1 (15.7, 26.4) |
| I do not smoke at present | 3.9 (0.0, 9.2) | 5.7 (0.3, 11.2) | 4.8 (0.0, 11.2) | 0.0 (NA) | 4.9 (2.0, 7.7) |
| Total | 100% | 100% | 100% | 100% | 100% |
| Attempted to stop | | | | | |
| Up to 1 year ago | 47.1 (33.4, 60.8) | 38.6 (27.2, 50.0) | 52.4 (37.3, 67.5) | 43.8 (19.4, 68.1) | 45.1 (38.5, 51.6) |
| More than 1 year ago | 49.0 (35.3, 62.7) | 44.3 (32.6, 55.9) | 31.0 (17.0, 44.9) | 31.2 (8.5, 54.0) | 45.1 (38.6, 51.6) |
| Never tried to stop smoking | 3.9 (0.0, 9.2) | 17.1 (8.3, 26.0) | 16.7 (5.4, 27.9) | 25.0 (3.8, 46.2) | 9.8 (5.9, 13.7) |
| Total | 100% | 100% | 100% | 100% | 100% |

Table 2. Sources of smoking cessation advice in the GGT region by age, as % (95% CI)

| | 25–44 years | 45–54 years | 55–64 years | 65–74 years | All |
|-----------------------------|-------------------|-------------------|-------------------|--------------------|-------------------|
| | n=51 | n=70 | n=42 | n=16 | n=179 |
| Doctor | 27.5 (15.2, 39.7) | 42.9 (31.3, 54.5) | 45.2 (30.2, 60.3) | 62.5 (38.8, 86.2) | 34.3 (28.1, 40.5) |
| Other health professional | 11.8 (2.9, 20.6) | 27.1 (16.7, 37.6) | 16.7 (5.4, 27.9) | 12.5 (0.0, 28.7) | 15.6 (10.9, 20.4) |
| Doctor* | 31.1 (17.6, 44.6) | 50.9 (37.9, 63.9) | 47.4 (31.5, 63.2) | 62.5 (38.8, 86.2) | 38.6 (31.8, 45.5) |
| Other health professional** | 14.3 (1.3, 27.2) | 35.4 (21.9, 48.9) | 22.2 (6.5, 37.9) | 25.0 (0.0, 55.0) | 21.4 (14.4, 28.3) |
| Family member or other | 78.4 (67.1, 89.7) | 55.7 (44.1, 67.4) | 71.4 (57.8, 85.1) | 50.0 (25.5, 74.5) | 69.8 (63.8, 75.8) |
| Any of the above | 80.4 (69.5, 91.3) | 74.3 (64.0, 84.5) | 81.0 (69.1, 92.8) | 81.2 (62.1, 100.0) | 78.4 (73.0, 83.8) |

* Excludes n=23 participants who did not visit a doctor in the previous 12 months
** Excludes n=68 participants who did not visit any other health professionals in the previous 12 months

Figure 2. Prevalence of smoking in the GGT region by education tertile



of preventable disease in Australia and is particularly problematic in younger age groups.¹⁷ This study provides baseline smoking data for rural areas and identifies intervention opportunities. General practice is well placed to implement validated tools and interventions for smoking prevention and cessation, including setting up systems and procedures.^{18–20} General practitioners, practice nurses and other health professionals should aim to address smoking at every patient encounter.

Conflict of interest: the authors have received unrestricted grants from Sanofi-Aventis Pty Ltd, Pfizer Inc., Roche Diagnostics Australia, and Servier Laboratories Pty Ltd to perform cardiovascular risk factor studies.

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References

1. Australian Institute of Health and Welfare. Australia's Health 2008. Cat. no. AUS 99. Canberra: AIHW, 2008.
2. Collins DJ, Lapsley HM. The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004/05. National Drug Strategy Monograph Series no. 66.

Canberra: Department of Health and Ageing, 2008.

3. Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez AD. The burden of disease and injury in Australia 2003. Canberra: AIHW, 2007.
4. Britt H, Miller GC, Charles J, et al. General practice activity in Australia 2006–07. General practice series no. 21. Cat. no. GEP 21. Canberra: Australian Institute of Health and Welfare, 2008.
5. Australian Institute of Health and Welfare. 2007 National Drug Strategy Household Survey: first results. Drug Statistics Series number 20. Cat. no. PHE 98. Canberra: AIHW, 2008.
6. Australian Bureau of Statistics. National Health Survey: Summary of Results, Australia 2004–05, (cat. no. 4364.0). Canberra: ABS, 2006.
7. Victorian Population Health Survey 2006. Department of Human Services, Victoria, 2006.
8. Greater Green Triangle Risk Factor Study: Limestone Coast and Corangamite Shire Surveys Basic Report. Greater Green Triangle University Department of Rural Health, Deakin and Flinders Universities, 2006.
9. Department of Primary Industries and Energy, Department of Human Services and Health. Rural, Remote and Metropolitan Areas classification 1991 census edition. Canberra: AGPS, 1994.
10. Janus ED, Laatikainen T, Dunbar JA, et al. Overweight, obesity and metabolic syndrome in rural southeastern Australia. *Med J Aust* 2007;187:147–52.
11. Australian Bureau of Statistics. 2001 Census basic community profile. Available at www.abs.gov.au [Accessed February 2007].
12. Laatikainen T, Vartiainen E, Puska P. Comparing smoking and smoking cessation process in the Republic of Karelia, Russia and North Karelia, Finland. *J Epidemiol Community Health* 1999;53:528–34.
13. Tucker JS, Ellickson PL, Orlando M, Klein DJ. Predictors of attempted quitting and cessation among young adult smokers. *Prev Med* 2005;41:554–61.
14. Chen K, Kandel DB. The natural history of drug use from adolescence to the mid-thirties in a general population sample. *Am J Public Health* 1995;85:41–7.
15. Chassin L, Presson CC, Rose JS, Sherman SJ. The natural history of cigarette smoking from adolescence to adulthood: Demographic predictors of continuity and change. *Health Psychol* 1996;15:478–84.
16. Lancaster T, Stead L, Silagy C, Sowden A. Regular review: Effectiveness of interventions to help people stop smoking: findings from the Cochrane Library. *BMJ* 2000;321:355–8.
17. Department of Health and Ageing. Australian National Tobacco Strategy 2004–2009. Canberra: Australian Government Department of Health and Ageing, 2004.
18. The Royal Australian College of General Practitioners. Putting prevention into practice: Guidelines for the implementation of prevention in the general practice setting. 2nd edn. South Melbourne: The RACGP, 2006.
19. The Royal Australian College of General Practitioners. Guidelines for preventive activities in general practice. 6th edn. South Melbourne: The RACGP, 2005.
20. Zwar N. Smoking cessation – What works? *Aust Fam Physician* 2008;37:10–4.