



Under-18 year old callers to New Zealand's Quitline

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Aim To investigate the characteristics of under-18 year old callers to New Zealand's Quitline (smoking-cessation telephone counselling service).

Methods Analysis of routinely collected demographic and smoking history characteristics of under-18 year old Quitline callers in 2004 and 2005.

Results In the 24 months of 2004–2005, 2371 under-18s called Quitline (for the first time) seeking smoking cessation support. Females (58.9%) and teens in their older teen years called most often. Compared with adult callers, there were significantly higher proportions of Māori (32.9% vs 19.6%) and Pacific (5% vs 3.6%) under-18 callers, and fewer European (64.0% vs 74.6%) and 'Other' (6.0% vs 7.1%) callers. Despite similar levels of nicotine dependence in under-18 and adult callers (70.1% vs 71.4% reported smoking within 30 minutes of waking), under-18s were issued nicotine replacement therapy (NRT) half as often (RR=0.51). Under-18s were more likely than adults to register a mobile phone number (48.9% vs 44.4%).

Conclusions Under-18 year old smokers are under-represented in the Quitline calling population. Māori and Pacific under-18s require further cessation support to avoid exacerbating existing disparities in smoking. Awareness that under-18 nicotine dependence is equivalent to that of adults should lead to improved provision of NRT for adolescents. Initiatives involving mobile phone technology are particularly appropriate for improving access to information and treatment for under-18s. Adolescent tobacco cessation should be accorded greater priority in tobacco control policy, practice, and research.

Tobacco smoking continues to be a major public health problem in New Zealand (NZ); almost a quarter of adults (15–64 years) are smokers,¹ and half of those who smoke will die prematurely from smoking-related conditions.²

Preventing tobacco smoking initiation at an early age is a key strategy in addressing tobacco use because over 80% of smokers begin smoking before the age of 18 years.³ Between one-third and one-half of those who experiment with tobacco become regular smokers.⁴ Currently 26.8% of 15–19 year old NZers smoke¹ and most want to quit: over half report making a cessation attempt in the past year.^{5,6}

If they could start their lives again, 72.3% of young NZ smokers surveyed would not smoke.⁷ However, young people's quit attempts are frequently unsuccessful, with the few experimental trials published yielding unassisted 3- to 6-month quit rates of around 0–11%.⁸

Cessation interventions specific to young people were largely overlooked in the literature until the mid-1990s due to a focus on preventing smoking initiation in this age demographic, and a recent Cochrane review concluded that evidence around tobacco cessation interventions for young people is still lacking.⁹

Cessation initiatives require better information about the characteristics of adolescents who seek help, so that appropriate interventions can be developed and adolescents not accessing cessation services identified. In this study we analysed the demographic and smoking characteristics of Quitline callers under the age of 18 years. Quitline is New Zealand's largest smoking cessation service, providing free and comprehensive information and advice on smoking cessation 6 days a week to over 30,000 callers each year, with a call-back service where Quit advisors provide ongoing support. In addition, Quit advisors send out exchange cards to eligible callers that enable heavily subsidised nicotine replacement therapy (NRT) patches and/or gum to be purchased.

Methods

Quitline routinely collects demographic and basic smoking data from all registered callers. We extracted data from Quitline for all first-time under-18 callers in 2004 and 2005 as part of a larger study analysing the effect on Quitline of the *Smokefree Environments Amendment Act* which came into force in December 2004. To enable comparative analysis, a population of 2000 randomly-selected 18-and-over (adult) first-time callers to Quitline was generated using a computerised random number list from the total of 61,387 18-and-over callers in the same time period.

The variables used for analysis were identified by examining the Quitline database fields for personal or programme factors that have been shown in the literature to affect cessation. Anonymity was maintained by excluding variables with identifying information. Three fields relating to previous cessation attempts were not in an extractable format for the time period chosen, and therefore could not be used.

Final variables analysed for this paper were: age, sex, ethnicity, type of contact phone number, time from waking to first tobacco (an indication of nicotine dependence¹⁰), and whether a NRT exchange card was issued.

Ethnicity total response coding¹¹ was used, with a combined variable 'Others' for Asian, Latin American, Middle Eastern, African, Other and Refused/Don't know responses, due to the small number of individuals in these categories.

Data were analysed using Intercooled Stata (version 9) software.¹² Measures of precision were not calculable for the under-18 observations because the dataset represents the full population of under-18 Quitline callers in the time period. Where possible, 95% confidence intervals (CIs) were calculated for adult callers and assessment of statistically significant differences between under-18 and adult callers determined by comparing the under-18 figure with the 95% CI for the adult population. Chi-squared results are noted as a test of independence, where applicable. Where there were missing values, the observation was excluded from analyses involving that variable, and this accounts for small differences in denominators between variables.

Results

Demographic characteristics—From 1 January 2004 to 31 December 2005, 2371 under-18s called Quitline. Callers ranged in age from 10 to 17 years, with more callers with each additional year of age (Figure 1).

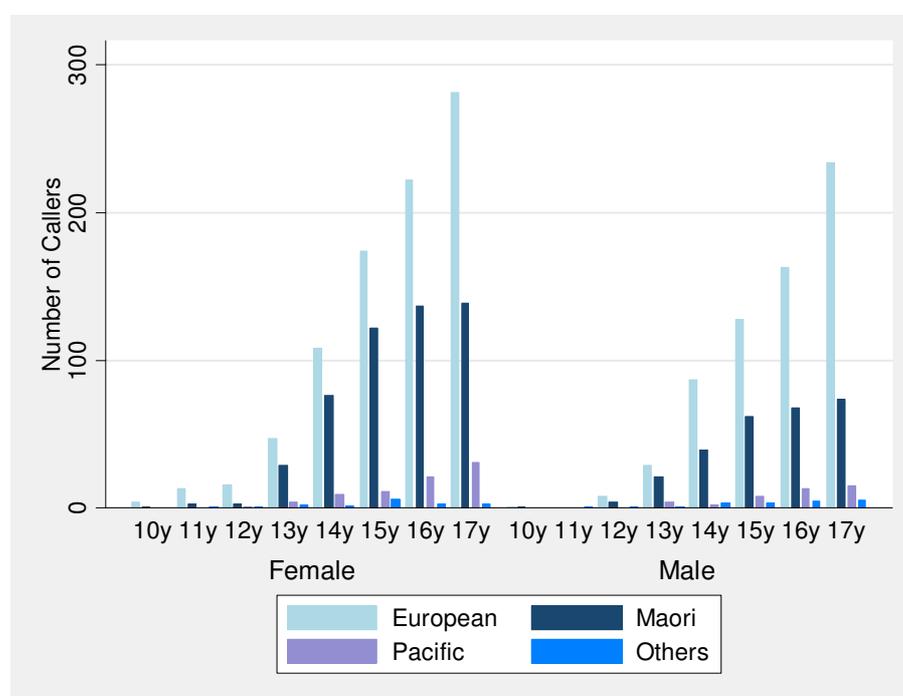
More females than males called Quitline in both under-18 and adult populations although there were proportionately more female callers among under-18s (58.9%) than adult (52.6%) callers (Chi-squared 17.37, $p < 0.001$) (Table 1).

Table 1. Callers to Quitline, by age group and gender

Gender	Under 18s (%)	Adults (%; 95% CI)	Total (%)
Male	969 (40.2)	941 (47.5; 45.2–49.7)	1910 (44.0)
Female	1386 (58.9)	1042 (52.6; 50.3–54.7)	2428 (56.0)
Total	2355	1983	4338

Compared to adult callers, under-18 callers were more likely to be of Māori or Pacific ethnicity (Table 2). Within the under-18 calling population, male and female European callers increased with each year of age. This trend attenuated with age among Māori callers, even though the absolute number of Māori male and female callers increased with each year of age, and began a lot earlier for Māori males than females (Figure 1).

Figure 1. Under-18 Quitline callers 2004–2005 by age, gender, and ethnic group



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Table 2 Callers to Quitline, by age group and ethnicity

Ethnicity	Under-18s (%)	Adults (%; 95% CI)	Total (%)
European	1518 (64.0)	1491 (74.6; 72.6-76.4)	3009 (68.8)
Māori	781 (32.9)	392 (19.6; 17.9-21.5)	1173 (26.8)
Pacific*	119 (5.0)	72 (3.6; 2.8-4.5)	191 (4.4)
Other	143 (6.0)	141 (7.1; 6.0-8.3)	284 (6.5)
Total	2371	2000	4371

*Mostly of Samoan, Tongan, Niuean, or Cook Islands origin.

Dependence—The proportion of under-18 callers who smoked tobacco within 30 minutes of waking was similar to that of adult callers (Chi-squared 0.59, $p=0.44$) (Table 3).

Table 3. Callers to Quitline, by age group and nicotine dependence

Time from waking to first cigarette	Under-18s (%)	Adults (%; 95% CI)	Total (%)
<30 minutes	975 (70.1)	1110 (71.4; 69.1–73.7)	2085 (70.8)
>30 minutes	415 (29.9)	444 (28.6; 26.3–30.9)	859 (29.2)
Total	1390	1554	2944

NRT exchange cards issued—Under-18s were half as likely to be issued an exchange card for NRT (RR=0.51). Under-18s who were issued NRT cards were significantly less likely to be issued a second card than adults (RR=0.27) (Table 4).

Table 4. NRT exchange cards issued, by age group

Number of NRT exchange cards issued	Under-18s (%)	Adults (%)	Total (%)
None	1710 (72.1)	520 (26.0)	2230 (51.0)
One	364 (15.4)	559 (30.0)	923 (21.1)
Two	297 (12.5)	921 (46.1)	1218 (27.9)
Total	2371	2000	4371

Mobile phone use—Nearly 49% of under-18 callers gave a mobile phone number as a contact number, compared to 44.4% of adult callers (Chi-squared=8.95, $p=0.003$).

Discussion

This is the first New Zealand study to focus on young smokers who want to quit. A comprehensive literature review did not identify any international studies that have researched the teenage subset of smokers who call quit lines.

Several findings were as expected: that older teens called Quitline more frequently than younger teens mirrors the increasing smoking rate with increasing age in teenagers,¹³ and our finding that females called more than males reflects the trend seen in adult quit lines.^{14,15}

Contrary to expectations, we found that Māori and Pacific callers comprised a greater proportion of the under-18 calling population than the proportions seen in the adult calling population. This is partly explained by the fact that Māori and Pacific people comprise greater proportions of the youth population (19.5% and 9.2% of 15–19 year olds respectively) than the total population (14.0% and 6.6% respectively).¹⁶ However, we had hypothesised that under-18 Māori and Pacific callers would be under-represented compared to their adult counterparts because Quitline's Maori/Pacific-focused advertising campaigns are targeted at adults only (25–44 year olds).

Māori and Pacific under-18 callers were still under-represented compared to their proportions in the adolescent smoking population: recent Action on Smoking and Health (ASH) surveys of 14–15 year olds, show that 37.8% of respondents who smoked at least weekly were Māori, and 12.8% were of Pacific ethnic origin.¹⁷

The 2371 under-18s who called Quitline in 2004 and 2005 represent 3.9% of the total of 61,387 Quitline callers in this period, a not insignificant increase on the 1.6% of callers who were under 18 in an analysis of 2001–2004 calls.¹⁸

Li and Grigg's study of Quitline callers over a longer period shows a 67% increase in the proportion of callers under 25 years between 2001–2005.¹⁹ There are several possible explanations for this increase.

Firstly, under-18s may have become more aware of Quitline through advertising and word-of-mouth since its launch in 1999. Although no advertising is targeted specifically at the teen age group, there is evidence from elsewhere that adult-focused anti-tobacco advertising has some impact on adolescents.²⁰

Secondly, some evidence suggests that under-18s have experienced increasing difficulty with tobacco purchasing in more recent years.²¹

Thirdly, legislative change prevented smoking in most workplaces in 2004 (the New Zealand school leaving age is 16 years and more than half of school students aged 16 years have part-time jobs²²). These latter factors may have contributed to an increasing number of young smokers wishing to quit.

While it is encouraging from a public health viewpoint that young smokers are increasingly calling Quitline, they are under-represented among first-time Quitline callers compared to the proportion of adult smokers who want to quit. Using 2006 Census¹⁶ and Tobacco Use Survey¹ data we estimate that there are around 80,450 adolescent smokers in NZ (26.8% of the 300,198 15–19 year olds) and 742,680 adult smokers (23.5% of 3,160,371 adults).

Quitline recorded a yearly average of 1185 under-18 and 30,694 total first-time callers in 2004 and 2005, suggesting that only about 1.5% of adolescent smokers called Quitline in that period, compared to 4.1% of adult smokers.

The fact that young smokers are less likely to call Quitline than their adult counterparts partly reflects a lack of attention to the promotion of quitting in adolescents in policy, practice, and research. Tobacco control policies concerning adolescents almost exclusively pertain to preventing tobacco initiation. Regarding practice, one US survey reported that only a third of young people were counselled about the dangers of tobacco use when visiting a doctor, and just 16.4% of young smokers were given advice to quit.²³

Brief advice from a physician is an effective cessation strategy in adults,²⁴ and combined with support, such as referral to Quitline or provision of NRT, may prompt a serious quit attempt in a young person.

Our research suggests that young smokers wanting to quit were not receiving equitable access to treatment such as NRT, despite having levels of nicotine dependence equivalent to that of adults. The reason for this may be licensing and national guideline restrictions that have, until recently, discouraged NRT-use in under-18s.

Accordingly Quitline policy required parental consent for exchange card issues to under-18s. Revised cessation guidelines support the consideration of NRT-use in 12–18 year old smokers²⁵ without parental consent, and training providers about this new guidance may go some way to overcoming the treatment gap. A further possible explanation of the difference in NRT provision between adults and under-18s may be a mistrust of young callers' reports of their dependence; or conversely, mistrust by young callers of the efficacy of NRT.

Publicity highlighting the efficacy of NRT²⁶ and the early onset of nicotine addiction²⁷ may help overcome this. Scragg et al's recent analysis of NZ ASH Year 10 Survey data²⁸ suggests that diminished autonomy can occur as early as after one cigarette.

Focus group research with adolescent smokers in North America has concluded that teen smokers are often not aware of cessation programmes, and that those who are aware have generally negative and false perceptions about them.²⁹

To increase the number of young people successfully quitting smoking, priority should be given to increasing the number accessing cessation services for help with quit attempts.³⁰ Adolescents want cessation programmes to be voluntary, free of charge, confidential, and of proven efficacy³¹ all characteristics of the Quitline that could be promoted specifically to teens to encourage them to make contact.

Imparting information about the early progression to nicotine dependence may help to increase the urgency³² of tobacco cessation efforts, so that young people prioritise quit attempts. Recent research points to using TV and cigarette packets as the primary marketing methods for such messages.¹⁷ The use of online marketing, through YouTube³³ or advertising space on other websites popular with young people, might also be effective although this remains understudied.

In addition to novel marketing ideas, innovative cessation initiatives show particular promise for young people. Groundbreaking New Zealand research showed that a mobile phone-based text message service improved quit rates.³⁴

Young people are high users of mobile phones (over 90% of 15–24 year olds according to the 2006 Census³⁵) and our research shows under-18s are more likely than adults to register a mobile phone number with Quitline. The reach and scope of any adolescent-specific cessation programmes based on mobile or web technology could be much broader, and alternatives to any face-to-face interventions warrant further research.

This study was limited in a number of ways. First, we used data collected for another purpose, thus some factors, such as socioeconomic position and quit rates, could not be studied. Second, missing observations prevented analysis of some variables. Finally, the generalisability of our findings to all young smokers may not be appropriate as those calling Quitline may differ in some way to other young smokers who want to quit.^{36,37}

In summary, the adolescent smoking rate may be decreasing¹ but young adults have the highest smoking rate of any age group. Unless cessation treatments become more accessible and effective for young people, the current adolescent smoking population may become yet another generation of adult smokers. A focus on preventing tobacco initiation to the neglect of cessation interventions has indirectly marginalised those teens who are already smokers. To correct this imbalance, and prevent widening disparities arising as the population smoking rate decreases, adolescent tobacco cessation should be accorded greater priority in tobacco control policy, practice, and research.

Competing interests: None known.

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References:

1. Ministry of Health. Tobacco Trends 2006: Monitoring tobacco use in New Zealand. Wellington: Ministry of Health; 2006. <http://www.moh.govt.nz/moh.nsf/pagesmh/5658>
2. World Health Organization. Why is tobacco a public health priority? Geneva: WHO; 2006 http://www.who.int/tobacco/health_priority
3. US Department of Health and Human Services. Preventing tobacco use among young people: a report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services, Public Health Service, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 1994. Reprinted with corrections, July 1994.
4. McNeill A. The development of dependence on smoking in children. *Br J Addict.* 1991;86(5):589–92.

5. Darling H, Reeder A, Waa A. Tobacco use among Year 10 and 12 students in New Zealand: a report on the Global Youth Tobacco Survey data. Wellington: Health Sponsorship Council; 2004.
6. Global Youth Tobacco Survey Collaborative. Tobacco use among youth: a cross country comparison. *Tob Control*. 2002;11(3):252–70.
7. Ministry of Health. New Zealand Tobacco Use Survey 2006. Wellington: Ministry of Health; 2007. <http://www.moh.govt.nz/moh.nsf/0/2DBE37909A88DA7ACC257300007FB7E7>
8. Sussman S, Dent CW, Lichtman KL. Project EX: outcomes of a teen smoking cessation program. *Addict Behav*. 2001;26(3):425–38.
9. Grimshaw G, Stanton A. Tobacco cessation interventions for young people. *Cochrane Database Syst Rev*. 2006(Issue 4):CD003289.
10. Heatherton TF, Kozlowski LT, Frecker RC, et al. Measuring the Heaviness of Smoking: using self-reported time to the first cigarette of the day and number of cigarettes smoked per day. *Br J Addict*. 1989;84(7):791–9.
11. Ministry of Health. Ethnicity Data Protocols for the Health and Disability Sector. Wellington: Ministry of Health; 2004.
12. StataCorp. Stata Statistical Software: Release 9.0. College Station, TX: StataCorp; 2005.
13. Centers for Disease Control and Prevention. Youth tobacco surveillance--United States, 2001-2002. *MMWR—Morbidity & Mortality Weekly Report*. 2006;55(3):1-56.
14. Zhu S-H, Anderson CM, Johnson CE, et al. A centralised telephone service for tobacco cessation: the California experience. *Tob Control*. 2000;9(Suppl 2):II48–55.
15. Moolchan ET, Berlin I, Robinson ML, Cadet JL. African-American teen smokers: issues to consider for cessation treatment. *J Natl Med Assoc*. 2000;92(12):558–62.
16. Statistics New Zealand. QuickStats About Culture and Identity [tables]. 2007 <http://www.stats.govt.nz/census/2006-census-data>
17. Poynter M. Youth Smoking Cessation in New Zealand: An Analysis of Under-18 Callers to the Smoking Cessation Hotline Quitline [MPH Dissertation]. Auckland: University of Auckland; 2007.
18. Darling H. Youth and Smoking Factsheet. Prepared for The Quit Group. 2005. <http://www.quit.org.nz>
19. Li J, Grigg M. Changes in characteristics of New Zealand Quitline callers between 2001 and 2005. *N Z Med J*. 2007;120(1256). <http://www.nzma.org.nz/journal/120-1256/2584>
20. White V, Tan N, Wakefield M, Hill D. Do adult focused anti-smoking campaigns have an impact on adolescents? The case of the Australian National Tobacco Campaign. *Tob Control*. 2003;12(Suppl 2):II23–9.
21. Laugesen M, Scragg R. Trends in cigarette smoking and purchasing by fourth-form students in New Zealand, 1992, 1997 and 1998. Wellington: MOH; 2000. <http://www.moh.govt.nz/moh.nsf/pagesmh/421>
22. Adolescent Health Research Group. New Zealand Youth: A profile of their health and wellbeing. Auckland: University of Auckland; 2003.
23. Shelley D, Cantrell J, Faulkner D, et al. Physician and dentist tobacco use counseling and adolescent smoking behavior: results from the 2000 National Youth Tobacco Survey. *Pediatrics*. 2005;115(3):719–25.
24. Lancaster T, Stead L. Physician advice for smoking cessation. *Cochrane Database Syst Rev*. 2004;18(4):CD000165.
25. Ministry of Health. New Zealand Smoking Cessation Guidelines. Wellington: Ministry of Health; 2007. <http://www.moh.govt.nz/moh.nsf/indexmh/nz-smoking-cessation-guidelines>
26. Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database Syst Rev*. 2004(3):CD000146.
27. Tobacco Advisory Group of the Royal College of Physicians. Nicotine Addiction in Britain. London: Royal College of Physicians; 2000.

28. Scragg R, Wellman RJ, Laugesen M, DiFranza JR. Diminished autonomy over tobacco can appear with the first cigarettes. *Addictive Behaviors*. 2008;33(5):689–98.
29. Balch GI, Tworek C, Barker DC, et al. Opportunities for youth smoking cessation: findings from a national focus group study. *Nicotine Tob Res*. 2004;6(1):9–17.
30. Zhu SH. Differential cessation rates across populations: what explains it and how to reduce it. Presentation to the Oceania Tobacco Control Conference, Auckland; 2007.
31. Stanton WR, Lowe JB, Fisher KJ, et al. Beliefs about smoking cessation among out-of-school youth. *Drug Alcohol Depend*. 1999;54(3):251–8.
32. Balch G. Exploring Perceptions of Smoking Cessation among High School Smokers: Input and Feedback from Focus Groups. *Prev Med*. 1998;27:A55–A63.
33. Freeman B, Chapman S. Is YouTube telling or selling you something? Tobacco Content on the YouTube video sharing website. Presentation to the Oceania Tobacco Control Conference, Auckland; 2007.
34. Rodgers A, Corbett T, Bramley D, et al. Do u smoke after txt? Results of a randomised trial of smoking cessation using mobile phone text messaging. *Tob Control*. 2005;14(4):255–61.
35. Statistics New Zealand. Household Use of Information and Communication Technology 2006. Wellington: Statistics New Zealand; 2007. <http://www.stats.govt.nz/products-and-services/hot-off-the-press/household-use-of-information-and-communication-technologies-survey-2006/household-use-ict-2006-hotp.htm>
36. Gould M, Greenberg T, Munfakh J, et al. Teenagers' Attitudes about Seeking Help from Telephone Crisis Services (Hotlines). *Suicide Life Threat Behav*. 2006;36(6):601–13.
37. Boehm K, Schondel C, Marlowe A, Manke-Mitchell L. Teens' concerns: A national evaluation. *Adolescence*. 1999;34(135):523–8.