



## Low and declining cigarette smoking rates among doctors and nurses: 2006 New Zealand Census data

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### Abstract

**Aims** To examine smoking status among doctors and nurses using data from the 2006 Census and to describe recent trends in smoking prevalence among doctors and nurses.

**Methods** Analysis of smoking status in 2006 New Zealand Census among medical practitioners and midwifery and nursing professionals, and comparison of cigarette smoking prevalences with findings of previous analyses of the census and surveys of doctors.

**Results** There were 6312 male and 4197 female doctors, and 2469 male and 32,682 female nurses included in the 2006 Census. Non-response to the smoking status questions were less than 5%. Only 4% of male doctors and 3% of female doctors were regular cigarette smokers in 2006. Among specialist groups, the highest smoking prevalence was 12% among male obstetricians and gynaecologists, and 10% among female radiologists and radiotherapists.

13% of female and 20% of male nurses were smokers. The highest smoking prevalences were among psychiatric nurses (26% male and 30% female nurses). There has been a steady decline in cigarette smoking among doctors and nurses in New Zealand since the 1960s and 1970s.

**Conclusions** The results from the 2006 Census demonstrate that non-smoking among doctors and nurses is increasingly the norm, around 90% of younger doctors have never been regular smokers. The results show that it is possible to achieve very substantial decreases in smoking prevalences and to establish smokefree cultures among substantial occupational groups who are well informed about the degree of risk, are aware of the reality of the health consequences of smoking, and work in a substantially non-smoking environment.

Smoking among health care workers, particularly doctors and nurses, has been a commonly researched topic since the health effects of smoking became widely known in the 1950s. Recent systematic reviews found 81 and 73 English language papers describing smoking among doctors and nurses respectively.<sup>1,2</sup> Health care workers are a key potential role model group for promoting a smokefree society, and due to their very high level of awareness of the major health effects of smoking are a potential vanguard group for achieving very low smoking prevalence.

In New Zealand, surveys of smoking among doctors on the medical register were carried out in 1963 and 1972.<sup>3,4</sup> These were followed by a series of analyses conducted by Sir David Hay of smoking among doctors and nurses based on data from the 1976, 1981, and 1996 censuses.<sup>5-8</sup> Each of these censuses included a

question on smoking status. On the basis of the encouraging trends in these analyses, Sir David speculated that by 2000 there could be a generation of non-smoking doctors.<sup>7</sup>

A recent letter to the *Journal* noted that no such similar analysis had been carried out using the 2006 Census data,<sup>9</sup> in response to which the prevalence among broad categories of health professionals has recently been reported.<sup>10</sup> There has also been a recent report on smoking among nurses in New Zealand giving overall prevalence of smoking and smoking by area of practice in the 2006 Census.<sup>11</sup> This report also covered a more detailed survey of beliefs and practices about smoking cessation among 371 nurses.

The purpose of this paper is to examine in more detail the smoking status of doctors and nurses using data from the 2006 Census and to describe recent trends in cigarette smoking prevalence among these health professionals.

## Methods

Analyses are based on responses to two questions on smoking in the 2006 New Zealand Census.<sup>12</sup> Responses to the questions are used to categorise individuals as current regular smoker, ex-regular smoker, and never-regular smoker. We excluded from the denominator all subjects who did not have valid data for the smoking questions.

- Do you smoke cigarettes regularly (that is, one or more a day)? Count only tobacco cigarettes. Don't count pipes, cigars, or cigarillos. (Yes / No)
- Have you ever been a regular smoker of one or more cigarettes a day? (Yes / No)

Responses to the smoking questions were analysed by age in four groups (15–24 years, 25–44 years, 45–64 years, 65+ years), by sex, and by occupation using levels 4 and 5 of the Australian and New Zealand Standard Classification of Occupations.<sup>13</sup> Student nurses and medical students were not separately coded in the census analyses, and are not included in the data presented.

For examining trends we considered data from surveys of doctors in 1963 and 1972,<sup>3,4</sup> and from censuses that included questions on smoking (in 1976, 1981, 1996, and 2006).<sup>5–8</sup>

There are minor discrepancies in the totals between and within the tables as all the numbers were random rounded to a multiple of three as per Statistics New Zealand protocol.

## Results

**Number of respondents and response**—There were 6312 male and 4197 female doctors, and 2469 male and 32,682 female nurses included in the census. Non-response to the smoking status questions was 2.9% in male doctors, 3.3% for female doctors, 4.5% for male nurses, and 3.5% among female nurses. This compared with a non-response for the smoking questions of 5.2% in all census respondents.<sup>12</sup> Percentages of current smokers, ex-smokers, and never-smokers in analyses presented exclude subjects who did not respond to either or both of the smoking status questions.

**Smoking among doctors in 2006**—The prevalence of smoking among all doctors and all those in the census with an occupational classification stratified by age and sex is shown in Table 1. Only 4.0% of male doctors and 3.0% of female doctors were regular smokers, with minor variations by age group. Smoking prevalence among doctors is substantially less than among the total employed population for males and females and all age groups. Around 90% of male doctors aged less than 25 years and of female doctors aged less than 45 years had never been regular smokers.

**Table 1. Smoking prevalence among doctors in the 2006 New Zealand Census\***

	Doctors			Total employed population		
	N	Regular Smoker (%)	Ex-smoker (%)	Never smoked regularly (%)	N	Regular smoker (%)
<b>Male</b>						
15-24	186	4.8	4.8	90.3	165,876	27.3
25-44	2,793	4.2	11.8	84.0	451,929	25.4
45-64	2,790	3.9	23.0	73.2	381,213	18.5
65+	360	2.5	44.2	52.5	50,748	9.2
All	6,132	4.0	18.5	77.4	1,049,766	22.4
<b>Female</b>						
15-24	300	3.0	7.0	91.0	150,579	23.4
25-44	2,445	2.7	8.8	88.5	411,699	22.1
45-64	1,263	3.6	15.9	80.8	343,110	17.4
65+	48	0.0	18.8	81.3	30,621	8.8
All	4,059	3.0	10.9	86.1	936,009	20.2

\*There may be minor discrepancies in the totals within this table (and between other tables) as all the numbers were random rounded to a multiple of three as per Statistics New Zealand protocol.

Table 2 shows smoking among doctors by speciality:

- Among male doctors, the highest smoking prevalence was among obstetricians and gynaecologists (11.8%) and the lowest among anaesthetists (2%).
- Among female doctors, the highest smoking prevalence was among radiologists and radiotherapists (9.7%) and the lowest among GPs (1.9%).

**Smoking among nurses in 2006**—The prevalence of smoking among all nurses stratified by age and sex is shown in Table 3.

Only 13.2% of female nurses were smokers, and 19.6% of male nurses. These compare with 20.2% of females and 22.4% of males among the total employed population. Smoking among nurses was higher than in the total employed population for the male nurses aged 45–64 and >65 years, and for female nurses over 65 years. Otherwise regular smoking was less common among nurses than in the total employed population in all other age groups for both genders. The proportion of smokers was highest in male and female nurses in the 15–24 years age group. However, there was also a very high proportion of female nurses in this age group who had never smoked regularly (72%).

**Table 2. Smoking prevalence among doctors by specialty in the 2006 New Zealand Census\***

	N	Regular Smoker (%)	Ex-smoker (%)	Never smoked regularly (%)
<b>Male</b>				
General Practitioner	2,313	3.4	20.8	75.9
Resident Medical Officer	1,710	4.2	14.7	80.9
Surgeon	606	3.5	20.3	76.2
Physician	990	5.5	19.4	74.8
Gynaecologist and Obstetrician	51	11.8	23.5	64.7
Radiologist, Radiation Oncologist	171	3.5	21.1	77.2
Anaesthetist	300	2.0	16.0	81.0
<b>Female</b>				
General Practitioner	1,572	1.9	9.5	88.4
Resident Medical Officer	1,560	2.5	8.5	88.7
Surgeon	63	4.8	14.3	81.0
Physician	612	5.4	19.6	75.0
Gynaecologist and Obstetrician	39	0.0	7.7	92.3
Radiologist, Radiation Oncologist	93	9.7	12.9	80.6
Anaesthetist	120	2.5	15.0	82.5

\* There may be minor discrepancies in the totals within this table (and between other tables) as all the numbers were random rounded to a multiple of three as per Statistics New Zealand protocol.

**Table 3. Smoking prevalence among nurses in the 2006 New Zealand Census**

	Nurses				Total employed population	
	N	Regular Smoker (%)	Ex-smoker (%)	Never smoked regularly (%)	N	Regular smoker (%)
<b>Male</b>						
15-24	63	23.8	23.8	57.1	165,876	27.3
25-44	1,176	18.6	23.2	57.7	451,929	25.4
45-64	1,068	20.8	36.2	43.3	381,213	18.5
65+	51	11.8	41.2	47.1	50,748	9.2
All	2,358	19.6	29.5	50.9	1,049,766	22.4
<b>Female</b>						
15-24	1,080	15.8	11.9	72.2	150,579	23.4
25-44	14,076	13.8	23.1	63.1	411,699	22.1
45-64	15,558	12.6	30.4	57.0	343,110	17.4
65+	837	9.7	33.0	57.0	30,621	8.8
All	31,548	13.2	26.6	60.2	936,009	20.2

\* There may be minor discrepancies in the totals within this tables (and between other tables) as all the numbers were random rounded to a multiple of three as per Statistics New Zealand protocol.

Table 4 shows smoking among nurses by speciality. Smoking prevalence was higher among male “principal” and psychiatric nurses. Among female nurses, smoking prevalence was 15% or lower for all groups of nurses, except for psychiatric nurses who had a particularly high prevalence (30%). Male and female psychiatric nurses had higher smoking prevalences than the overall male and female census population.

The lowest smoking prevalences (<10%) were among midwives and Plunket nurses (the latter being community-based nurses who focus particularly on child health and development). Midwives and Plunket nurses provide smoking cessation support and advice about smokefree homes, so are potentially key smokefree role models within communities.

**Table 4. Smoking prevalence among nurses by specialty\* in the 2006 New Zealand Census<sup>#</sup>**

	<b>N</b>	<b>Regular Smoker (%)</b>	<b>Ex-smoker (%)</b>	<b>Never smoked regularly (%)</b>
<b>Male</b>				
Principal Nurse	111	21.6	27.0	54.1
Registered Nurse	1,632	17.6	28.7	53.9
Psychiatric Nurse	525	26.3	33.7	40.6
Other male nurse	81	15.4	26.9	57.7
<b>Female</b>				
Principal Nurse	1293	15.3	29.9	55.0
Registered Nurse	25,011	12.8	25.9	61.3
Psychiatric Nurse	1,140	30.0	29.7	40.0
Plunket Nurse	474	9.5	27.8	62.0
Public Health and District Nurse	1,236	10.9	31.1	58.0
Occupational Health Nurse	174	13.8	31.0	55.2
Midwife	2,217	9.3	28.0	62.7

\* Principal nurses are senior nurses including charge nurses. Registered nurses are general staff nurses working mainly in a hospital setting. See text for a description of Plunket nurses.

# There may be minor discrepancies in the totals within this tables (and between other tables) as all the numbers were random rounded to a multiple of three as per Statistics New Zealand protocol.

### **Trends in smoking prevalence among doctors and nurses**

Census data shows that regular cigarette smoking among doctors has declined steadily since 1976 (Figure 1). Smoking prevalence was only 5% by the 1996 census for male and female doctors, and by 2006 had declined to 4% and 3% respectively.

Cigarette smoking prevalence was also assessed in samples of doctors in 1963 and 1972 (2623 in 1963 and 3113 in 1972). In 1963 only occasional and regular cigarette

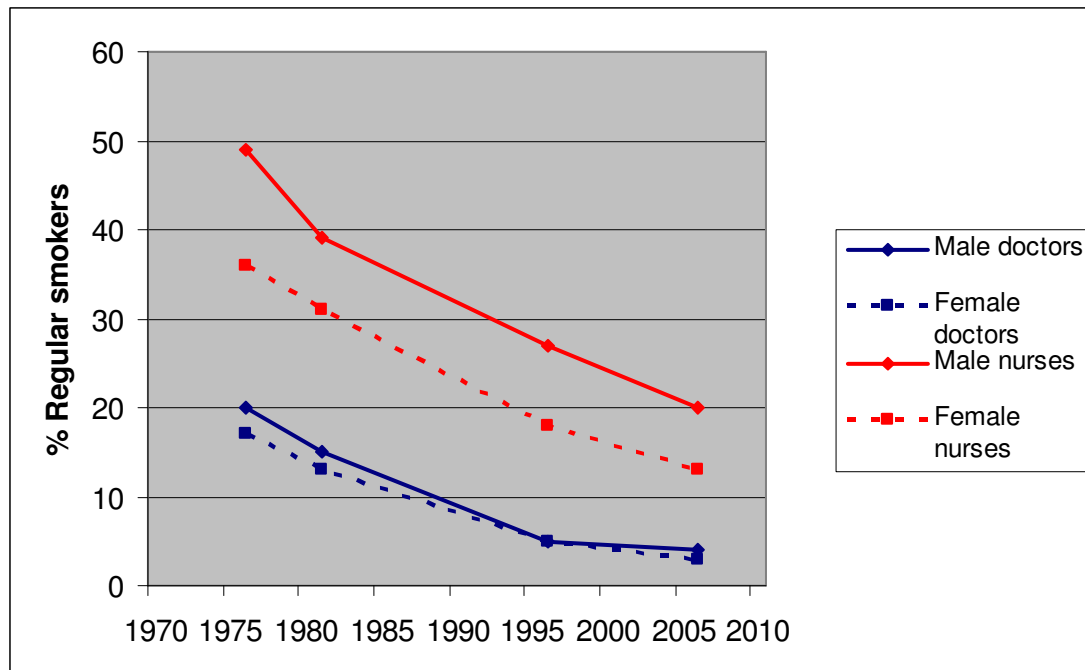
smoking combined was measured, and was 35.5% among men and 28.8% among women.<sup>4</sup>

By 1972 this had declined to 22.0% in men and 14.6% among women doctors. Regular cigarette smoking was 17.4% for male doctors and 12.2% among female doctors in 1972.<sup>3</sup>

Smoking among nurses has also decreased regularly since first assessed in 1976, and has declined further in 2006. Smoking prevalence among psychiatric nurses has remained high. In 1976 49% of female and 50% of male psychiatric nurses were regular cigarette smokers. This reduced to 46% of females and 38% males in 1981, and to 31% for males and female psychiatric nurses in 1996.

Table 4 shows that there has been little further decline among female psychiatric nurses, though male smoking prevalence has reduced to 26%.

**Figure 1. Trends in regular cigarette smoking prevalence among doctors and nurses in New Zealand from New Zealand census data**



Sources: 1976, 1981, 1996, and 2006 censuses.<sup>5-8</sup>

## Discussion

The results from the 2006 Census demonstrate that non-smoking among doctors and nurses is increasingly the norm. The vast majority of doctors are now non-smokers, and among younger doctors, around 90% have never been regular smokers. Among nurses there has been a steady decline, so that female nurses now have a smoking prevalence well below the population level, in contrast to the situation in 1976 and 1981.<sup>5,7</sup> Male nurses formerly had a very high smoking prevalence. This too has also

decreased and is now slightly below overall male smoking prevalence in New Zealand. If recent trends continue, smoking will soon also be a rarity among nurses.

A major strength of this study is that uniquely it is based on a census rather than a sample of health care workers. A potential limitation is that there was a proportion who did not complete the smoking status question (less than 5% in the occupational groups included in this study). It is plausible that these individuals may be more likely to be smokers (and not report this due to social desirability bias) and hence the smoking prevalence figures may be a slight underestimate. However, given the low non-response rate this is unlikely to greatly affect the findings. Another limitation is that even the level 5 occupational categories are aggregations of a broad range of types of doctors and nurses, so a more finely focused assessment of smoking status by particular specialties was not possible.

In the international review of smoking among doctors, from 15 studies which have been published since 2000, smoking prevalences varied between 2% and 40% in all doctors, 5% to 32% among male doctors, and 0 to 23% among female doctors.<sup>1</sup> Smoking prevalence among New Zealand doctors is therefore probably one of the lowest in the world. Among studies of nurses published between 1996 and 2006, the mean smoking prevalence was 20%.<sup>2</sup> Since this prevalence was largely among female nurses, this shows that the New Zealand smoking prevalence for female nurses of 13% is also lower than in most other countries where surveys have been performed.

These figures are encouraging as health professionals, particularly doctors and nurses are likely to be important role models to the rest of the community for health-related behaviours. These health workers are also important for delivering smoking cessation services and the credibility of this service delivery may be undermined if the provider is known to be a smoker.

The persisting high smoking prevalence among psychiatric nurses is of concern, and has been reported in other countries.<sup>14-17</sup> It identifies a high risk group who may particularly benefit from targeted smoking cessation advice and support. It is also of concern because of the possible impact on smoking among patients attending mental health services, which have been shown to be very high in numerous studies around the world.<sup>18</sup> Further research would be useful to explore the reasons for continued high smoking prevalence in this group and to examine the effect of interventions to reduce smoking among all those working and living in mental health service settings given the important links between mental health and smoking.<sup>19</sup>

Nevertheless, all health workers who continue to smoke could benefit from targeted smoking cessation support using evidence-based pharmacotherapy and counselling support.<sup>20</sup> These can be delivered (and ideally paid for) by employing health sector agencies. This could be justified on the grounds of reducing absenteeism levels, improving work productivity and reducing the adverse role model of have smoking health professionals in healthcare settings and in the community.

In conclusion, data from the 2006 census in New Zealand confirms the very low prevalence of smoking among doctors and low and decreasing smoking prevalence among nurses. The results show that it is possible to achieve very substantial decreases in smoking prevalence and that smokefree cultures can become established and be maintained among substantial occupational groups who are well informed

about the degree of risk, are aware of the reality of the health consequences of smoking, and work in a substantially non-smoking environment. This provides hope that with strong tobacco control policies a similar smokefree culture and very low prevalence of smoking could be established much more widely in the population.

**Competing interests:** Wilson and Edwards have previously worked for NGOs and the Ministry of Health on tobacco control issues.

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