

Review Article

Declining Rates of Tobacco Use in the Japanese Medical Profession, 1965–2009

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ABSTRACT

Background: Although there has been a downward trend in smoking rates among medical doctors in recent years, rates have been higher among Japanese doctors when compared internationally.

Methods: We extensively reviewed all published English- and Japanese-language articles that reported the smoking rates of Japanese doctors.

Results: A total of 36 articles were examined, most of which had been conducted as postal surveys, usually by a national, prefectural, or local medical association. Sample sizes ranged from 17 to 11 773, and response rates ranged from 33% to 91%. National surveys conducted between 1965 and 2009 suggest that there has been a statistically significant ($P < 0.0001$) decline in smoking rates among Japanese doctors (from around 68% to 16% among males and from 19% to 5% among females).

Conclusions: Overall, the published data reveal a significant decline in smoking rates among Japanese doctors since 1965, especially among men. Although less than one-fifth of Japanese male doctors now smoke, more work needs to be done in tobacco control to help further reduce the burden of smoking, especially in medical schools.

Key words: smoking; tobacco; physician; doctor; Japan

INTRODUCTION

At least 5 million people die each year from the effects of tobacco use, and current projections suggest that 8 million smokers will be dying from smoking every year by 2030. There are over 1 billion smokers in the world today, and up to half of them will die prematurely from a tobacco-related disease.¹ However, this need not be so. Among the top 5 risk factors for mortality, tobacco use is the most preventable. Therefore, because they are on the front lines of primary care, health professionals have a key role in tobacco control at both the individual and societal levels. In addition, their professional organizations can show leadership and influence local, national, and global efforts to combat the current epidemic.² Given these clear responsibilities as providers of care and public role models, it is surprising that some healthcare professionals continue to smoke. As a result, tobacco use among this group can be seen as one of the last “unmet challenges” for those working in public health.³

As one of the most well-respected health professionals, doctors have a major role in tobacco control, particularly as exemplars and role models of healthy lifestyles. Doctors who

smoke naturally attract public scepticism,⁴ and for at least 35 years it has been suggested that doctors could best persuade their patients to quit tobacco use if they themselves did not smoke.^{5,6} For these reasons, medical professionals tend to give up smoking earlier than the general population in which they operate.⁷ Substantial progress has been made in reducing the smoking rates of doctors in many countries,⁷ although these gains have not necessarily been uniform or sustained. For example, a large review of the topic, published in 1989,⁸ reported a downward trend in smoking rates among male doctors in most countries; however, the decrease was less obvious among women. On the other hand, a 2007 review⁹ of tobacco use in the medical profession found that doctors in some developing countries and newly developing regions still smoked at relatively high rates. Among the industrialized countries examined, Japanese doctors have relatively high smoking rates.⁹ Approximately 290 000 doctors currently practice in Japan.¹⁰ Despite this fact, there has been no detailed examination of smoking rates among Japanese doctors. Moreover, recent trends in tobacco use in this profession have not been comprehensively investigated. Thus, we conducted a detailed review of published reports that had

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data on smoking rates among Japanese doctors, and examined smoking trends within this group over time.

METHODS

The first stage of our literature review was undertaken in the first half of 2012 and involved an extensive English-language search using the PubMed website of the US National Library of Medicine (NLM).¹¹ The search terms included: tobacco, smoke, physician, doctor, medical, and Japan. Various keyword variations and combinations were used, as were the Boolean operators AND, OR, and *, to identify keyword variations such as Japan and Japanese, and smoke and smoking. A Japanese-language search was then undertaken using the Japana Centra Revuo Medicina's *Ichushi* Website.¹²

Japanese-language sources identified during this search included the following journals (with English-language titles in parentheses): *Igaku no Ayumi* (Journal of Clinical and Experimental Medicine), *Kanagawa Igakukai Zasshi* (Journal of the Kanagawa Medical Association), *Kawasaki Igakukai Shi* (Kawasaki Medical Journal), *Kikanshi Gaku* (Journal of the Japan Society for Bronchology), *Kousei no Shihyo* (Journal of Health and Welfare Statistics), *Nihon Kokyu Kanri Gakkaishi* (Journal of Japan Society for Respiratory Care), *Nihon Kosho Eisei Zasshi* (Japanese Journal of Public Health), *Nihon Kyobu Shikkan Gakkai Zasshi* (Japanese Journal of Thoracic Diseases), *Nippon Eiseigaku Zasshi* (Japanese Journal of Hygiene), *Nippon Iji Shinpo* (Japan Medical Journal), *Nippon Ishikai Zasshi* (Journal of the Japan Medical Association), *Osakufu Ishikai News* (Osaka Medical Association News), *Toukeibugan* (Japanese Journal of Head and Neck Cancer), and the *Toyama Kenritsu Chuo Byoin Igaku Zasshi* (Medical Journal of the Toyama Prefectural Central Hospital).

Full text copies of all articles were obtained and examined in detail, and the reference lists were then reviewed to locate additional sources, many of which did not appear to have been indexed by PubMed or *Ichushi*. All data were compiled into 2 tables (one for English articles and one for Japanese articles), which were then sorted by the year the study was conducted (from earliest to most recent). When the year of the study was not specified, the publication year was used. The earliest study was conducted in 1965, and the most recent was undertaken in 2009; thus, the period 1965–2009 was selected for the current review. Smoking prevalence rates and study response rates for each article were then rounded to the nearest whole number and included in the tables. All data were added to a spreadsheet program and analyzed using statistical techniques, including mean values and linear regression for trend.¹³

RESULTS AND DISCUSSION

A total of 20 English reports describing 17 studies of the smoking habits of Japanese doctors were published between

1967 and 2011, as shown in Table 1. Most of the English studies (75%) were postal surveys, and had usually been conducted by a national, prefectural, or local medical association—the Japan Medical Association (JMA) was the most common surveying body (accounting for 32%). A total of 17 Japanese reports describing 19 different studies were identified for the period 1980–2010, as shown in Table 2. Most (58%) were postal surveys, and had often been conducted by medical associations or specialist groups; 26% were conducted at single hospitals. Four studies had used data from surveys of JMA members. An examination of all studies (published in both languages) showed that the prevalence of smoking among Japanese doctors ranged from 7% to 66% between 1965 and 2009 (7%–68% among men and 0%–19% among women).

Sample sizes ranged from 17 to 11 773, and response rates ranged from 33% to 91%. Trend analysis of the published data showed a statistically significant decline in smoking rates among Japanese doctors since 1965 ($P < 0.0001$; $y = -1.2875x + 2595.6$) (Figure 1). Much of this decline was due to marked reductions in smoking rates among male doctors ($P < 0.0001$), from over 70% in the 1960s to around 10% in more-recent studies. A decline in tobacco use among female Japanese doctors also occurred over time, although the reduction was substantially less than that observed for men (from less than 20% in the 1960s to around 5% in recent studies) (Figure 2).

The earliest study of smoking rates among Japanese doctors appears to have been undertaken by Nishizumi and Kuratsune,¹⁴ whose 1967 article reported a smoking prevalence among Japanese doctors of 68% in men and 19% in women. In addition to providing groundbreaking national data on tobacco use among JMA members, their study proved to be a rich data source for later longitudinal investigations. In the 1980s, for example, Kono and colleagues published follow-up studies of doctors who had been enrolled in the original study.^{15,16} The most recent investigation of smoking among a national sample of Japanese doctors (again, JMA members) was published by Wada and colleagues in 2009¹⁷ and reported much reduced smoking rates of 16% for men and 5% for women. Similarly low smoking rates among female doctors, as compared with their male counterparts, have been recently reported in China.¹⁸ A plot of reported smoking rates from all studies (Figure 1) clearly demonstrates the magnitude of this decline in Japan, which is consistent with trends in many other countries. For example, the earliest large-scale reviews of doctors' smoking habits appear to have been undertaken by Adriaanse and colleagues,^{8,19} who found that smoking prevalence rates had declined substantially in many countries since the 1950s. An examination of individual studies since then suggests that the most significant long-term declines in physician smoking rates have been in the United States,²⁰ the United Kingdom,²¹ Australia,²² and New Zealand.²³ Much of the decline in smoking rates among Japanese doctors has occurred among men, as shown in Figure 2.

Table 1. Research publications describing the smoking rates of Japanese doctors (published in English)

Location	Data Source	Year ^b	Method	Current Smoker ^a			Ex-Smoker	Never Smoker	Study Details		Authors
				All	Male	Female			Sample Size	Response Rate ^c	
Various ^d	Japan Medical Association	1965	Postal Survey	66%	68%	19%	17%	17%	11 773	49%	Nishizumi & Kuratsune, 1967 ¹⁴
Fukuoka	Fukuoka Prefectural Medical Association	1983	Postal Survey	42%	43%	9%	—	—	4190	84%	Kaetsu et al, 2002 ⁵²
Nationwide	Pharmaceutical company ^e	1986*	n/s	39%	—	—	—	—	9456	—	Kawane, 1986 ⁵³
Nationwide	Japan Society of Chest Diseases	1989	Postal Survey	25%	26%	6%	39%	36%	3640	59%	Kawane, 1991, ⁵⁴ 1993, ⁵⁵ 2001 ⁵⁶
Fukuoka	Fukuoka Prefectural Medical Association	1990	Postal Survey	32%	33%	5%	—	—	3565	63%	Kaetsu et al, 2002 ⁵⁷
Toyama	Cardiologists at 3 University Hospitals	1992	Hand-delivered	40%	—	—	—	—	17	—	Miwa et al, 1995 ⁵⁸
Nationwide	World Health Organization ^e	1994*	n/s	44%	—	—	—	—	—	—	Audet, 1994 ⁵⁹
Kanagawa	Kawasaki Medical School Hospital	1994	Hand-delivered	29%	—	—	21%	50%	163	60%	Kawane & Soejima, 1996 ⁶⁰
Tokyo	A Central Tokyo Hospital ^f	1994	Postal Survey	21%	24%	7%	47%	31%	323	71%	Kawakami et al, 1997 ⁶¹
Fukui	Fukui Prefectural Medical Association	1996–97	Postal Survey	26%	28%	5%	46%	28%	709	91%	Kawahara et al, 2000 ⁶²
Various ^g	Japan Medical Association	2000	Postal Survey	—	27%	7%	—	—	3771	84%	Ohida et al, 2001 ^{63,64}
Various ^g	Japan Medical Association	2004	Postal Survey	16%	22%	5%	30%	—	3633	81%	Kaneita et al, 2008 ⁶⁵
Fukui	Graduates from the University of Fukui	2004	Postal Survey	—	13%	4%	—	46%	261	48%	Kanayama et al, 2012 ¹⁰
Various ^h	Medical Residents in 16 Training Hospitals	2005	Postal Survey	19%	—	—	—	—	196	86%	Wada et al, 2007 ⁶⁶
Nationwide	Surgeons and Anesthesiologists ⁱ	2005	Postal Survey	12%	—	—	30%	58%	1063	53%	Kai et al, 2008 ⁶⁷
Various ^g	Japan Medical Association	2008	Postal Survey	—	15%	5%	—	—	3486	77%	Kaneita et al, 2010 ⁶⁸
Nationwide	Japan Medical Association	2009	Postal Survey	14%	16%	5%	12%	74%	4055	41%	Wada et al, 2011 ⁶⁹

^aSmoking rates rounded to nearest whole number, ^bYear study was conducted (when not specified, publication year is listed*), ^cResponse rates rounded to nearest whole number, ^dHyogo, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Kochi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, and Kagoshima, ^eAdditional details of study were not specified, ^fLocation as stated in article, ^gHokkaido/Tohoku, Kanto, Chubu, Kinki, Tyugoku/Shikoku, and Kyushu, ^hHokkaido/Tohoku, Kanto, Chubu, Kansai, and Kyushu, ⁱBoard-certified members of the Japanese Association for Thoracic Surgery or the Japanese Society of Anaesthesiologists, n/s = Not clearly specified.

Although smoking rates in the Japanese medical profession have clearly fallen, Japan remains somewhat of a paradox in tobacco control because it is a developed country with a relatively high societal smoking prevalence rate. In 1950, for example, the national smoking prevalence rate among Japanese citizens older than 19 years was around 82% in men and 13% in women.²⁴ However, there has been a long-term decline in Japanese smoking rates since the 1970s,¹³ mostly due to control measures instigated by various government agencies, which had themselves been influenced by social movements.²⁵ By 1993, the smoking rate among

Japanese men had decreased to around 60%, but had increased to around 14% among women. Furthermore, between 1969 and 1996, the average daily cigarette consumption per Japanese smoker continuously increased.²⁴ According to the World Health Organization (WHO), approximately 38% of Japanese men and 11% of Japanese women older than 20 years currently smoke.²⁶ Currently, smoking has one of the largest impacts on life expectancy in Japan^{27,28} and causes a significant health burden, especially among men.²⁹ This situation is worsened by the current low rate of cessation attempts by Japanese men.³⁰

Table 2. Research publications describing the smoking rates of Japanese doctors (published in Japanese)

Location	Specialty	Year ^b	Method	Current Smoker ^a			Ex-Smoker	Never Smoker	Study Details		Authors
				All	Male	Female			Sample Size	Response Rate ^c	
Osaka	Osaka Medical Association	1979	n/s	—	52%	12%	—	—	3197	58%	Yokota, 1980 ⁷⁰
Saga	Saga Prefectural Medical Association	1983	Postal Survey	—	44%	—	42%	14%	729	81%	Nishizumi, 1986 ⁷¹
Osaka	Toyonaka City Medical Association	1987	Postal Survey	—	37%	8%	—	—	323	90%	Yokota, 1988 ⁷²
Okayama	Kawasaki Medical School Hospital	1987	Hand-delivered	—	24%	—	33%	43%	120	50%	Kawane et al, 1989 ⁷³
Kanagawa	Yokosuka City Hospital ^d	1988	Hand-delivered	40%	—	—	40%	20%	25	46%	Nomura et al, 1991 ⁷⁴
Toyama	11 Medical Associations in Toyama	1989*	n/s	29%	—	—	—	—	1002	n/s	Igarashi & Muroya, 1989 ⁷⁵
Nationwide	Japan Society of Chest Diseases	1989	Postal Survey	25%	26%	6%	39%	36%	3640	59%	Kawane & Soejima, 1991 ⁷⁶
Kanagawa	Yokosuka City Hospital ^d	1990	Hand-delivered	44%	—	—	32%	24%	25	46%	Nomura et al, 1991 ⁷⁴
Nationwide	Japan Society of Chest Diseases	1996	Conference Survey	23%	—	—	—	—	2411	65%	Kobayashi & Kitamura, 1997 ⁷⁷
Gifu	Gifu Medical Hospital	1996	Hand-delivered	25%	25%	0%	22%	—	270	85%	Kano et al, 1999 ⁷⁸
Fukui	Fukui Prefectural Medical Association	1996–7	Postal Survey	—	28%	8%	—	—	794	91%	Ohida et al, 2000 ⁷⁹
Tokyo	Clinic-based Doctors ^e	1998*	Postal Survey	21%	24%	8%	49%	29%	245	68%	Kawakami et al, 1998 ⁸⁰
Tokyo	Hospital-based Doctors ^e	1998*	Postal Survey	19%	23%	0%	33%	47%	366	68%	Kawakami et al, 1998 ⁸⁰
Nationwide	Japan Medical Association	2000	Postal Survey	—	27%	7%	—	—	3885	87%	Sakurai & Ohida, 2000 ⁸¹
Nationwide	Japan Society for Respiratory Care	2003	Conference Survey	—	9%	0%	—	—	171	n/s	Takiguchi, et al ⁸²
Nationwide	Japan Medical Association	2004	Postal Survey	—	22%	5%	—	—	3776	86%	Kaneita & Ohida, 2005 ⁸³
Nationwide	Japan Medical Association	2008	Postal Survey	—	15%	5%	—	—	3561	80%	Kaneita et al, 2009 ⁸⁴
Nationwide	Japan Society for Head and Neck Cancer	2008	Postal Survey	7%	7%	3%	39%	53%	974	33%	Miyahara et al, 2009 ⁸⁵
Various	Japan Medical Association	2009	Postal Survey	—	16%	5%	—	—	4055	41%	Wada et al, 2010 ¹⁷

^aSmoking rates rounded to nearest whole number, ^bYear study was conducted (when not specified, publication year is listed*), ^cResponse rates rounded to nearest whole number, ^dStudies done at same location but at 2 different times (1988 and 1990), ^eStudies done at the same time but at 2 different locations (clinics and general hospitals), n/s = Not clearly specified.

Doctors have an important role in the fight against smoking.³¹ Although there has been a clear decline in smoking rates among Japanese doctors since 1965, not all studies reported positive attitudes towards tobacco control. A 2001 study of Japanese university hospitals, for example, found that less than 2% of the surveyed facilities were aiming for complete prohibition of smoking on the hospital site.³²

A research group on prospective measures for anti-smoking and passive smoking in Japan has now been funded by the Japanese Ministry of Health, Labour and Welfare, and its website shows current information on the status of Clean-Air Medical Universities in Japan.³³ Interestingly, smoking rates among members of the Japanese Cancer Association (JCA) increased between 2004 and 2006 (from 6% to 9%),³⁴

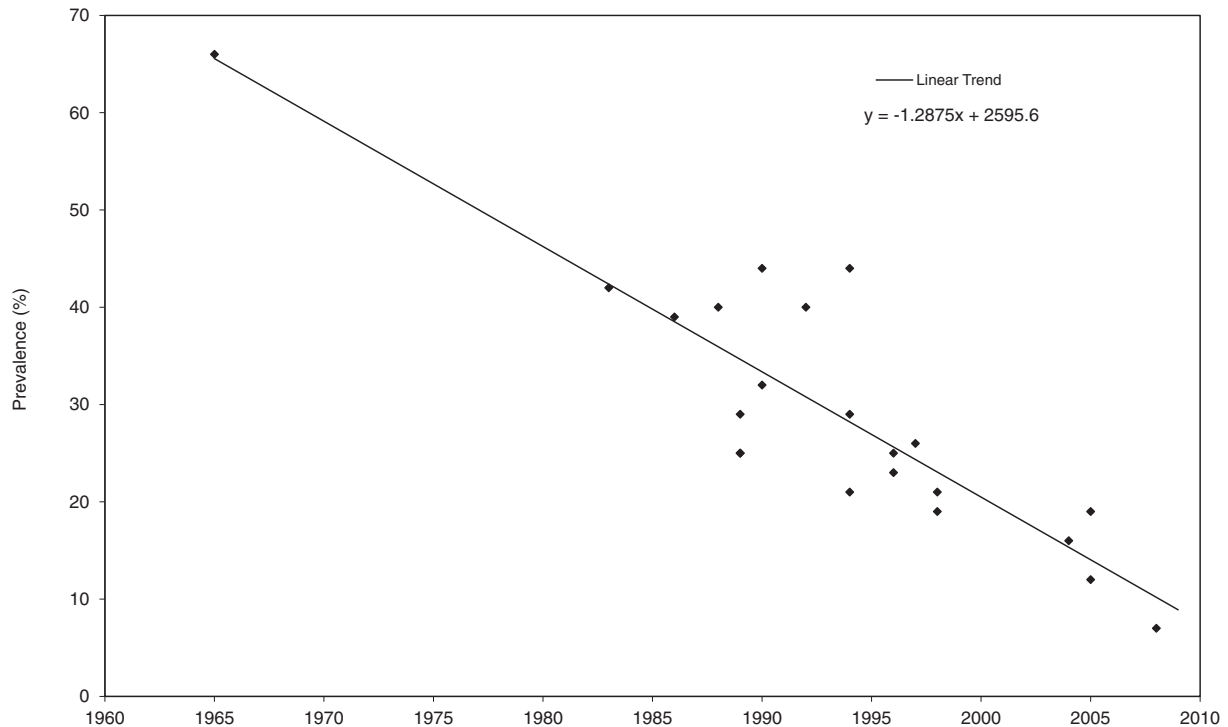


Figure 1. Declining overall trend in smoking among Japanese doctors, 1965–2009

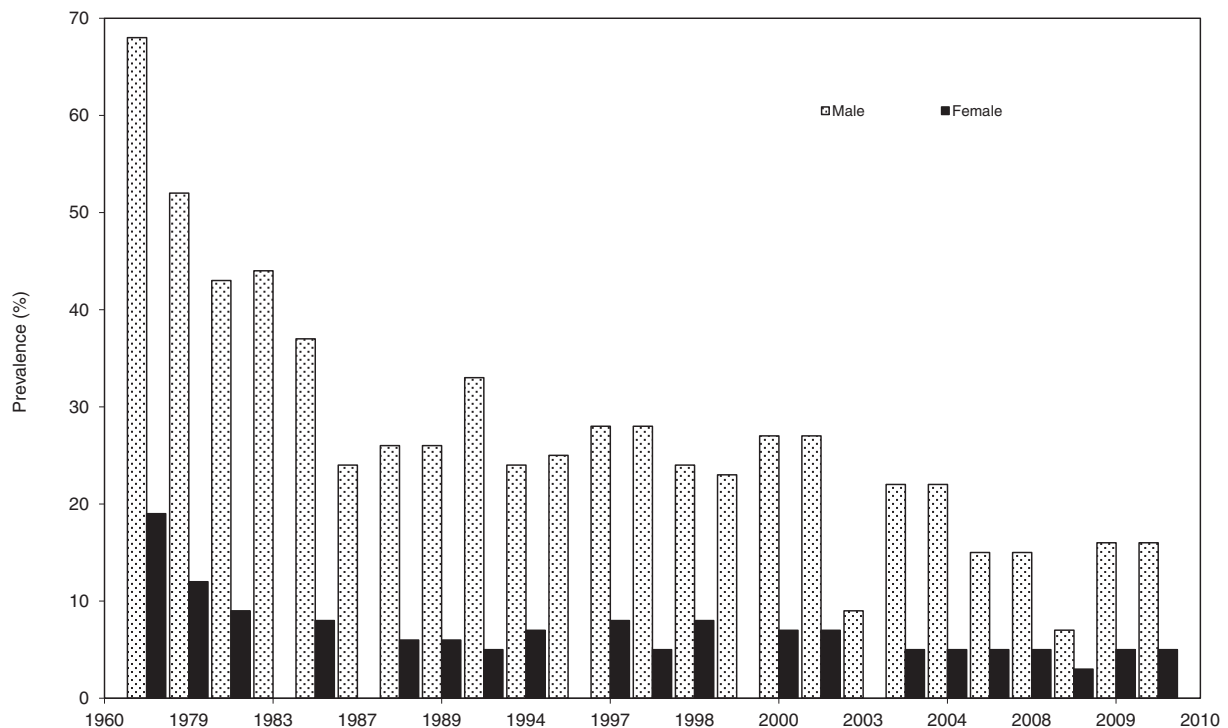


Figure 2. Declining prevalence of smoking among Japanese doctors by sex, 1965–2009

although it is important to remember that these figures are still far below community smoking rates in Japan. One confounder may be the next generation of health professionals, as research suggests that, despite the increasing proliferation of campus-wide smoking bans, too many Japanese university students are still using tobacco.³⁵ A 2007 survey, for example, reported

that dental students had the highest student smoking rate in Japan,³⁶ while an international review of this topic also indicated that Japan has one of the higher smoking rates among dental students in industrialized countries.³⁷ This may reflect higher smoking rates within the Japanese dental profession, as compared with their peers in other countries.³⁸

Two recent studies of Japanese dentists reported that 25% to 28% were current smokers,^{39,40} while a national survey of Japan Dental Association (JDA) members documented a smoking prevalence of 30% among men and 11% among women.⁴¹

Smoking appears to be less common in the Japanese medical profession than in the dental profession; a trend that also includes medical students. A recent study in Nagoya, for example, documented a medical student smoking rate of only 6% among men and 2% among women.⁴² This is a decline from the 14% smoking prevalence rate documented among Japanese medical students between 2006 and 2007⁴³ and is a major improvement from the rates reported in a variety of earlier studies.⁴⁴ It is unclear whether Japanese medical students who smoke will continue to do so when they graduate and start work as doctors. Although focusing tobacco control education on doctors before they graduate may be an appropriate way forward, such efforts would clearly need to be part of a wider strategy that targets students in all health disciplines, especially dentistry. Enforcement of a total smoking ban on all university campuses may be a way forward, as this has recently been shown to be an effective strategy for increasing the quit rate among teachers in some Japanese primary and high schools.⁴⁵

Despite these ongoing challenges, Japanese health care professionals have much to celebrate with regard to tobacco control. In recent times, monitoring the societal prevalence of smoking has become essential for understanding the tobacco epidemic, and Japan is one of the world's highest-achieving countries in this respect.⁴⁶ Japan has been a signatory to the WHO Framework Convention on Tobacco Control (FCTC) since 2004,⁴⁶ and smoking rates among Japanese men declined by almost half between 1990 and 2009 (falling from 61% to 38%).²⁶ Nishizumi and Kuratsune's 1967 paper on smoking habits within the Japanese medical profession¹⁴ can be seen as an archetypal Asian epidemiologic study, all the more so given that it was published in English in a Japanese journal. Furthermore, it was a Japanese doctor and epidemiologist, Takeshi Hirayama,⁴⁷ who conclusively proved the dangers of passive smoking in his groundbreaking 1981 study published in the *British Medical Journal*.⁴⁸ Hirayama has since been described by the anti-tobacco advocate, Professor Judith Mackay, as the "grandfather of Asian epidemiology."⁴⁹ Much can still be learned from his work in public health epidemiology.

Various Japanese medical associations are exercising professional leadership in tobacco control. Since 2008, the largest of these, the JMA, has formed a group of 9 doctors, known as the Project Committee Concerning Health Support for JMA Members Working in Hospitals. The JMA has also released a 7-point declaration on tobacco control.⁵⁰ Since 2003, the Japanese Respiratory Society has required those seeking board certification as respiratory physicians to be nonsmokers.⁵¹ The application of these measures, combined

with the significant reductions in overall smoking rates observed since 1965, represents a clear move toward achieving a smoke-free medical workforce in Japan.

CONCLUSION

The published data show a significant decline in smoking rates among Japanese doctors since 1965, especially among men. Although less than one-fifth of Japanese male doctors now smoke, more work in tobacco control is necessary to help further reduce the burden of smoking, especially in medical schools.

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