

# International Comparisons of Trends in Cigarette Smoking Prevalence

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**Abstract:** Data on smoking prevalence since 1974 are presented for the United States, Canada, Great Britain, Australia, Norway and Sweden. During this period, sex-specific prevalence has decreased in all the countries studied, with the exception of Norway, where women showed an increase. There was also a considerable decline in uptake of smoking by the young over this period, suggesting that the observed decline in prevalence is likely to continue. In the United States, the rate of decline in adult smoking prevalence has been linear. This linear pattern is probably similar in prevalence in most other countries studied, with the notable exception of Australia, which demonstrated no change for the majority of the period.

Among the six countries studied, the United States had neither

the lowest smoking prevalence nor the fastest rate of decline over the period. Differential patterns of change infer that the successful public health interventions in some countries are not being applied in others. While the lack of change in Australia prior to 1983 is surprising, this was followed by a sizable drop in smoking prevalence for both higher and lower educational groups in conjunction with the introduction of mass media-led antismoking campaigns. Most of the other countries report an ever increasing gap in prevalence between higher and lower educational groups. These findings suggest that all countries might benefit from a greater exchange of antismoking ideas and public health action. (*Am J Public Health* 1989; 79: 152-157.)

## Introduction

It is now over 25 years since the first major authoritative reviews of the serious health consequences of smoking<sup>1,2</sup> appeared in the public health literature. Since that time, the degree of public health mobilization and the type of activity have differed considerably across countries in the developed world. The most recent Surgeon General's report reviews progress in the United States over the last 25 years.<sup>3</sup> Of interest is how the United States has performed in comparison to other nations in achieving a reduction in the prevalence of smoking.

This paper reviews recent trends in reported cigarette smoking prevalence in six developed countries which have used different mixes of public health action to reduce cigarette smoking in their societies. Smoking trends across countries can be compared to identify those that have exhibited significantly higher rates of change or sudden shifts in prevalence. Either of these phenomena suggest the presence of a more effective intervention. If such occurs, then an analysis of public health action in that country could lead to suggestions for improvement in other countries.

In comparing cigarette smoking in differing countries, care needs to be taken to ensure that major sociodemographic differences that are associated with smoking do not confound the comparison. For the United States, the two most important differences are gender and education.<sup>4,5</sup> Accordingly, in this paper, I report smoking prevalence by each of these variables. Furthermore, as the proportion of each population taking up the habit is a crucial variable affecting future smoking prevalence,<sup>6</sup> I report a measure of sex-specific uptake for each country.

## Methods

The major markers of behavioral change in smoking are the sex-specific adult prevalence, uptake of smoking by the young, and trends in smoking behavior in different educational categories. The goal measure of adult prevalence in this paper is the prevalence of smoking in those aged 20 years and

over. As in the trend analyses for the United States,<sup>4-6</sup> uptake of smoking is indicated by the proxy variable "prevalence in age 20 to 24 years." The advantage of this measure is that differences due to variations in wording (such as daily smoking or any smoking) should be minimized; at least in the United States, 90 per cent of smokers report starting to smoke regularly before age 21.<sup>3</sup> This proxy for uptake will give a lagged estimate of what is actually happening by as much as five years.<sup>4</sup>

Details of data collection procedures and definitions for these two variables are presented below for each of the six countries. As educational level and education categorization of citizens in different countries differ considerably, this variable is presented separately to allow cross-cultural comparisons of categorizations.

### United States

In the United States, the National Center for Health Statistics undertakes a regular household survey on the health practices of the nation. Since 1974, there have been regular smoking supplements to these surveys which report self-reported smoking behavior on a representative random sample of respondents. Smoking status was defined from two questions: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?"<sup>7</sup> In the years previous to 1974, similar smoking data were obtained, often from another (proxy) adult living in the same household; this methodological difference is the reason for starting these trends in 1974. The response rate for the tobacco supplement has been reported as varying between 87 and 90 per cent.<sup>4</sup> Comparison of estimates of consumption from self-reported smoking with estimates from tax data<sup>8</sup> demonstrates a consistent 30 percentage point difference between the two estimates. Biochemical testing in community studies<sup>9,10</sup> suggests that this difference is not a result of people misreporting their smoking status.

### Great Britain<sup>11</sup>

The Social Survey Division of the Office of Population Censuses and Surveys in Great Britain has conducted an annual General Household Survey since 1974. Sample size for these surveys has been between 12,000 and 14,000 households. Interviews are sought with all members of the household over 16 years of age and, where this is not possible, proxy interviews are accepted from a near relative.

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This has occurred in approximately 5 per cent of households. Responses have been obtained from 81 per cent to 84 per cent of households in each survey year. Questions on smoking habits were included on each survey from 1972 to 1976 and every second year thereafter. Cigarette smoking status is defined from responses to the following questions: "Do you smoke cigarettes at all nowadays?" "Have you ever smoked cigarettes regularly?"

Other surveys have been commissioned regularly by the Tobacco Advisory Council and the Office of Population Censuses and Surveys. The first set of surveys are undertaken annually on quota samples of approximately 10,000 people. These data are adjusted to overcome differences in estimates between the self-reported and the tax data.

#### Canada<sup>12</sup>

Statistics Canada is responsible for an annual Labor Force Survey which covers the civilian non-institutionalized population 15 years of age and over from the 10 provinces of Canada. In the survey, 56,000 dwellings are sampled each month with sub-samples being interviewed each month for six months in a panel design. The Smoking Behavior of Canadians Survey has been conducted as a supplement to the Labor Force Survey; the sample was approximately 31,000 individuals in 1986 with a reported response rate of 95 per cent. Proxy respondents are accepted and smoking status of individuals is decided from responses to the following questions: "Has (the chosen respondent) ever smoked cigarettes, cigars or pipe?" "At the present time, does (the chosen respondent) smoke cigarettes?" "At the present time, does (the chosen respondent) smoke cigarettes regularly?" In 1986, proxy respondents made up 30 per cent of the sample.

#### Australia<sup>13,14</sup>

Surveys of tobacco smoking in Australia have been commissioned five times since 1974 by the Anti-Cancer Council of Victoria using the national commercial pollster, Roy Morgan Research.<sup>9</sup> Cluster samples of 10 interviews were obtained by approaching consecutive households starting from a stratified random sample of houses drawn from electoral rolls. Data were collected from respondents ages 14 years and over. These surveys report a 40 per cent non-response rate, half of which comes from those we were unable to contact and the other half from refusals to participate in the well-known weekly "omnibus" survey on consumer products. The representativeness of the sample was demonstrated by comparing demographics obtained for subdivisions with those obtained from published Census data.<sup>10</sup> Validation of self-reported smoking was shown by comparison with saliva cotinine on large sub-samples at two points in time.<sup>4</sup>

Respondents were shown a card and asked to classify themselves into one of 10 smoking categories made up from current smoking of the different combinations of cigarette, cigar, and pipe smoking. Smoking prevalence used in this paper is derived from the following categories "Smoke only cigarettes" "Smoke cigarettes and also cigars/pipe."

#### Scandinavian Countries

Each year, in each of the Scandinavian countries, surveys are conducted of nationwide, representative population samples between the ages of 18 and 70 years drawn from a population registry. In Sweden,<sup>15</sup> in-person household interviews on samples of approximately 2,000 people were conducted from 1976 to 1983 with mailed questionnaires being used from 1984 to 1987. Between 1976 and 1983,

response rates varied from between 80 and 82 per cent. Since 1984, a direct random sample of equivalent size drawn from the nationwide registry received a mailed questionnaire with a letter emphasizing the importance of self-completion and guaranteeing anonymity. Non-respondents are given two mailed reminders after which a random 50 per cent are interviewed by telephone. The estimated weighted response rate has varied between 85 and 90 per cent. Each of these countries uses the questions recommended by the World Health Organization to categorize smokers: "Have you ever smoked?"; "Have you ever smoked daily for six months or more?"; "Do you now smoke daily, occasionally or not at all?"; "What kinds of smoking material do you use (cigarettes, other)?"

The Norwegian Central Bureau of Statistics conducts annual in-person household interviews on a representative sample (approximately 2,500 each year) of the Norwegian population between 16 and 74 years of age.<sup>16</sup> Smoking questions are the same as those used for Sweden.

#### Educational/Socioeconomic Categorization

Educational level of smokers is reported for each country except the United Kingdom which prefers to report occupationally based categories of social class or major socioeconomic group. The Appendix presents approximate equivalent categories for each country. In all countries there is a natural division of education between secondary or high school level and post-secondary. However, the division of post-secondary into college graduate and less than college graduate has varied over the years in differing countries. Similarly, the actual level of certification for satisfactory completion of high school education has varied within a given country over time. Accordingly, caution should be used in interpreting these data. The data are satisfactory for assessing whether there is a smoking differential across educational categories and for identifying whether there has been a differential trend across such categories as has been suggested in the United States.<sup>5</sup>

#### Analysis

For the United States data, prevalence estimates from 1974 to 1985 were weighted to reflect the US population and age standardized to the 1985 age distribution. Standard errors for prevalence estimates were adjusted for sampling design by using variance curves provided by the National Center for Health Statistics.<sup>4</sup> The change in these data was equally well fit by both a linear and a logit model<sup>6</sup>; for simplicity, the linear model is preferred. Weighted least squared regression analysis was used to calculate the average yearly change in prevalence over the period. The effect of age adjustment and using weighted analysis altered the estimated yearly change by less than 0.05 per cent per year.

For other countries, the reported prevalence has been weighted to reflect the population. Neither age standardization nor weighted analyses were possible from the available data. Using the linear pattern in the United States as justification, a simple linear model was fitted to the data from each country to arrive at an estimated change per year. Without the relevant standard errors and with age adjustment of the population for different years, this analysis must be considered to be crude and should only be used to identify differences which are orders of magnitude away from those reported for the United States.

Results

Smoking Prevalence

By 1974, smoking prevalence in Adult males in the United States, Australia, and Canada was in the low 40s (Table 1). These levels were considerably lower than those for Great Britain and Norway where over half of the adult male population was smoking. However, by the mid 1980s, with the exception of Norway, all six countries reported male smoking prevalence in the low 30s. For the United States, a linear model fits the 1974 to 1985 data extremely well ( $R^2 = 0.97$ ) and smoking prevalence has been decreasing each year by 0.91 of a percentage point (standard error 0.03). According to this model, the 1987 estimate is 31.7 which is exactly the same as the observed estimate. There was considerable variation in the average rate of change in smoking prevalence calculated for the other countries. The estimated change was largest in Great Britain at 1.35 percentage points per year. Canada, Norway, and Sweden report changes of the same order of magnitude as the United States. Among Australian males, the linear model indicates that there has been little change in smoking prevalence. The observed data suggest that minimal change occurred between 1974 and 1983. However, there was a drop of six percentage points between 1983 and 1986, suggesting that the linear model is inappropriate to describe smoking trends among Australian males over this period.

In contrast to males, female smoking in 1974 had not risen to much over 30 per cent of the population in any country except Great Britain (Table 2). By the mid 1980s, smoking prevalence had declined in adult women in all countries except Norway and perhaps Australia. In the United States, the linear model fitted to the 1974 to 1985 observed data explained 88 per cent of the variation and the change per year was 0.33 per cent (SE 0.06). According to the linear model, the 1987 estimate should have been 26.9 per

TABLE 1—Trends in Smoking Prevalence for Males, ages 20 and Over

Year	United States	Great Britain	Australia	Canada	Norway††	Sweden†
1974	43.4	52	42.3		54.0	
1975				45.6	49.6	
1976	42.1	46	40.9		49.9	36
1977	40.9			43.0	44.9	32
1978	39.0	45			46.6	33
1979	38.4			40.4	45.2	31
1980	38.5	43	43.3		43.7	26
1981				38.7	40.5	27
1982		39			41.2	26
1983	35.5		38.9	35.7	44.6	26
1984		37			43.3	27
1985	33.0				40.3	25
1986		35	32.9	32.3	43.8	24
1987	31.7*				41.3	24
Change/year	-0.91**	-1.4‡	-0.05†	-1.21‡	-0.77‡	-0.99‡

†18-70 years only, includes only daily smokers for 6 months or more  
 ††20-70 years only  
 \*provisional estimate only  
 \*\*obtained from weighted regression analysis of age standardized data from 1974 to 1985<sup>6</sup>  
 ‡obtained from simple linear regression of yearly prevalence data.  
 SOURCES: United States Fiore, *et al.*<sup>4</sup>  
 Great Britain Wald, *et al.*,<sup>12</sup> and Ebi-Kryston personal communication  
 Australia Hill,<sup>13</sup> Pierce,<sup>14</sup> and personal communication  
 Canada Millar,<sup>12</sup> and personal communication  
 Norway Lund, personal communication  
 Sweden Ramstrom<sup>15</sup> and personal communication

TABLE 2—Trends in Cigarette Smoking Prevalence for Females, 20 Years of Age and Over

Year	United States	Great Britain	Australia	Canada	Norway††	Sweden†
1974	31.4	41	31.9		31.4	
1975				32.0	32.1	
1976	31.3	38	34.5		31.2	34
1977	31.4			31.8	29.7	31
1978	29.6	37			31.5	34
1979	29.2			30.7	33.1	32
1980	29.0	37	32.9		30.5	26
1981				29.6	31.0	31
1982		34			34.8	30
1983	29.4		31.4	29.3	32.3	28
1984		32			35.5	30
1985	28.0				32.5	31
1986		31	30.6	26.6	32.4	30
1987	26.8*				33.3	27
Change per year	-0.33**	-0.8‡	-0.02‡	-0.49‡	+0.20‡	-0.58‡

†18-70 years only, includes only daily smokers for 6 months or more  
 ††20-70 years only  
 \*provisional estimate only  
 \*\*obtained from weighted regression analysis of age standardized data 1974-1985<sup>6</sup>  
 ‡obtained from simple linear regression of yearly prevalence data.  
 SOURCES: United States Fiore, *et al.*<sup>4</sup>  
 Great Britain Wald, *et al.*,<sup>12</sup> and Ebi-Kryston personal communication  
 Australia Hill,<sup>13</sup> Pierce,<sup>14</sup> and personal communication  
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cent, 0.1 per cent higher than that observed. This rate of change is lower than that estimated for Great Britain, Sweden, and Canada. While the rate of change in almost all countries is well below that reported for males, by the mid 1980s in all countries except Sweden, there were still fewer female than male smokers.

Uptake of Smoking

With the exception of the United States and Sweden, the prevalence of smoking among males from 20 to 24 years of age approximated 50 per cent in the mid-1970s (Table 3). During the mid-1980s, however, there was a major decline in the uptake of smoking in the United States, Australia, and Canada. In the United States, the linear model explained 75 per cent of the variation in the observed 1974 to 1985 data. The rate of decrease was 1.03 percentage points per year (SE 0.27). According to this model, the 1987 figure should be 31.3 which is slightly higher than the observed 31.1 per cent. Considerable variability was again evidenced in the Australian data with a high 56.5 estimate for 1980 which meant that the slope of the regression line was close to zero.

Prevalence of smoking in young females (Table 4) varied considerably between countries in the mid-1970s with the highest rate of smoking occurring in Scandinavia. Thereafter, higher estimates of smoking prevalence were recorded in almost all countries for at least one year before prevalence started to decrease. In the United States and Australia, the mean change over the period was positive. In the case of the United States, the linear model had a rate of change of +0.11 percentage points per year (SE 0.27). Smoking prevalence in 1987 was 28.1 which is substantially lower than the estimate from the linear model. In all countries except Australia, the mid-1980s estimate was below that of 1974. In nearly all countries, once the prevalence began to drop it did so at a rate equal to or greater than that of young males over the whole period. This was particularly evident in the Canadian data.

TABLE 3—Trends in Smoking Prevalence for Males, 20 to 24 Years of Age

Year	United States	Great Britain	Australia	Canada	Norway	Sweden†
1974	44.3	52	49.2		52.5	
1975				48.3	41.8	
1976	45.9	47	46.4		49.2	39
1977	40.4			40.7	37.6	28
1978	38.5	45			47.8	36
1979	37.7			39.8	41.0	27
1980	40.0	44	56.5		44.2	25
1981				40.8	36.2	20
1982		41			41.4	17
1983	36.9		42.5	37.3	37.8	17
1984		40			39.1	25
1985	31.0				43.5	14
1986		41	39.8	32.0	36.5	25
1987	31.1*				36.4	14
Change/year	-1.03**	-0.9‡	-0.06‡	-1.23‡	-0.80‡	-1.71‡

†18–24 years, includes only daily smokers for 6 months or more  
 \*provisional estimate only  
 \*\*obtained from weighted regression analysis of age standardized data from 1974 to 1985.<sup>8</sup>  
 ‡obtained from simple linear regression of yearly prevalence data.  
 SOURCES: United States Fiore, *et al.*<sup>4</sup>  
 Great Britain Wald, *et al.*<sup>12</sup> and Ebi-Kryston personal communication  
 Australia Hill,<sup>13</sup> Pierce,<sup>14</sup> and personal communication  
 Canada Millar,<sup>12</sup> and personal communication  
 Norway Lund, personal communication  
 Sweden Ramstrom<sup>15</sup> and personal communication

TABLE 4—Trends in Cigarette Smoking Prevalence for Females, 20–24 Years of Age

Year	United States	Great Britain	Australia	Canada	Norway	Sweden†
1974	35.4	44	37.6		45.4	
1975				38.3	45.4	
1976	34.2	45	43.2		42.2	49
1977	37.4			45.2	37.9	44
1978	32.5	43			45.4	44
1979	34.0			42.3	47.0	36
1980	32.5	40	39.7		42.0	27
1981				39.9	36.2	40
1982		40			49.4	34
1983	37.0		43.3	37.3	37.8	29
1984		36			43.1	28
1985	32.5				43.5	33
1986		38	40.6	31.3	34.2	42
1987	28.1*				33.1	27
Change per year	-0.11**	-0.7‡	+0.23‡	-1.39‡	-0.88‡	-1.31‡

†18–24 years, includes only daily smokers for 6 months or more  
 \*provisional estimate only  
 \*\*obtained from weighted regression analysis of age standardized data from 1974 to 1985.<sup>8</sup>  
 ‡obtained from simple linear regression of yearly prevalence data.  
 SOURCES: United States Fiore, *et al.*<sup>4</sup>  
 Great Britain Wald, *et al.*<sup>12</sup> and Ebi-Kryston personal communication  
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Smoking by Educational/Socioeconomic Level

In each of the countries studied which reported smoking data by educational level, the prevalence of smoking decreased with increasing education (Table 5). Furthermore, there was approximately a twofold difference in smoking prevalence between the highest and lowest educational categories.

TABLE 5—Trends in Cigarette Smoking Prevalence by Education Level, 20 Years of Age and Over

Educational Level	United States	Australia	Canada	Norway††	Sweden†
High					
Group 1	16.3	19.9	19.9		
Group 2	26.1	29.8	26.0	22	25.8
Medium	33.1	32.9	34.2	37	29.0
Low	35.7	36.3	31.6	43.5	34.1

†18–70 years only, includes only daily smokers for 6 months or more  
 ††20–70 years only  
 SOURCES: United States Pierce, *et al.*<sup>5</sup>  
 Australia Hill, personal communication  
 Canada Millar<sup>12</sup>  
 Norway Lund, personal communication  
 Sweden Ramstrom, personal communication

A similar trend was observed across socioeconomic groups in the United Kingdom. In 1984, smoking prevalence in professional men and women was 17 per cent and 15 per cent, respectively. For males, smoking prevalence rose inversely with socioeconomic category to a high of 49 per cent for the unskilled, manual category. Smoking prevalence in women was in the high 20s for non-professional white-collar workers and in the high 30s for all workers in lower socioeconomic categories.

Trends in Smoking by Educational Level

Trend information for the highest and lowest categories of education are presented in Table 6 for four countries. In the United States, the linear model for college graduates explained 92 per cent of the variation in the observed data. The estimated reduction in smoking prevalence per year is 0.91 percentage points (SE 0.13). This model predicted that the 1987 prevalence would be 16.5 per cent which was slightly higher than the observed 16.3 per cent. For those with less than high school education, the linear model accounted for 85 per cent of variation in the data. The annual rate of decline was 0.19 percentage points (SE 0.03). This model predicted that smoking prevalence in this group would be 33.8 percent in 1987, considerably lower than the observed estimate of 35.7 per cent. Thus, the difference in the rate of reduction between the highest and lowest education levels was at least ninefold. A twofold difference was reported in Canada and a threefold difference in Norway. Australia was the only country in which smoking prevalence decreased approximately equally in both the highest and lowest categories.

Discussion

Trends in smoking prevalence have been compared for six countries known for their public health action to reduce smoking in their societies. In each country, there was a marked difference in the rate of change between males and females as the historical gap between the sexes diminishes.<sup>4</sup> This differential rate of change might reflect a real difference between the genders in response to the public health message. However, a recent analysis of the proportion of ever smokers who have quit (quit ratio) in the United States<sup>4</sup> suggests that the explanation lies in differences in age-specific cigarette smoking levels that result from the historical patterns of smoking uptake, i.e., the cohort effect suggested by Warner and Murt.<sup>17</sup>

For both males and females in the United States, the decline in smoking prevalence between 1974 and 1985 oc-

**TABLE 6—International Trends in Smoking Prevalence in Highest and Lowest Educational Categories, 20 Years of Age and Over**

Year	United States		Canada		Australia		Norway	
	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest
1973							(	
1974	28.3	36.5					(29.4	45.8
1975			31.2	37.6			(	
1976	27.4	35.8			30.0	37.0		
1977	25.6	35.8	30.2	36.1				
1978	23.8	35.3						
1979	23.4	34.9	27.5	34.3				
1980	24.6	35.5			29.3	37.2		
1981			24.3	33.1				
1982								
1983	19.9	34.7	22.7	31.1	27.5	35.2		
1984								
1985	18.4	34.1					(	
1986			19.9	31.6	24.3	32.0	(22	43.5
1987	16.3*	35.7*					(	
Change/year	-0.91**	-0.10**	-1.10‡	-0.61‡	-0.57‡	-0.50‡	-0.57‡‡	-0.18‡‡

\*provisional data only  
 \*\*obtained from weighted regression analysis of age-standardized data from 1974 to 1985<sup>6</sup>.  
 ‡obtained from simple linear regression of yearly prevalence data.  
 ‡‡obtained from averaging the change between the midpoints of each time intervals over the years  
 SOURCES: United States Pierce, *et al.*<sup>5</sup>  
 Australia Hill, personal communication  
 Canada Millar<sup>12</sup>  
 Norway Lund, personal communication

curred at a constant rate and the linear model closely predicted the 1987 prevalence. The decline in prevalence for each sex could very well be linear also in Great Britain, Canada, Norway, and Sweden. While caution is needed in comparing smoking prevalences in any given year, the United States is at the low end of any comparison. The country with by far the lowest prevalence is Sweden, although this might be confounded by the substitution of other tobacco products such as moist snuff, cigars, and pipes.\* Of all the sex-specific trends reported, only women in Norway demonstrated an increase in smoking prevalence.

The rate of change in prevalence was much higher in Great Britain than in other countries, although this was also associated with a high initial prevalence in that country. Although methodological differences prevent precise statistical comparison, it is probable that the rate of change was higher for both sexes in Canada than in the United States and higher for women in Sweden. For both genders in Australia, although the linear model suggested that smoking prevalence had not declined much, the data are consistent with the reported large drop in prevalence that occurred with the introduction of the mass media-led coalition campaigns in that country.<sup>18,19</sup>

There also has been a consistent decline in the uptake of smoking among males in the United States in recent years. The rate of this decline was surpassed only in Canada and Sweden, although the estimates for the latter are somewhat unstable from small sample size. Again, in Australia, data indicated no linear trend, although this maybe an artefact of small sample size and an abnormally high reading for 1980. Uptake in young females in the United States did not decline between 1974 and 1985, but the 1987 prevalence suggests that such a decline has started to occur. This decline was well under way in other countries with large decreases in prevalence noted in Canada, Sweden, Norway, and Great Britain,

although in each case prevalence started from a much higher base than in the United States. For both males and females, with the exception of Sweden, the United States had the lowest rate of uptake.

In every country smoking is much more prevalent in the lower socioeconomic groups than in the higher ones. Between 1974 and 1987, in both the United States and Canada, there was a major and consistent yearly decrease in smoking prevalence in the highest educational category. The rate of change was much greater in the highest compared to the lowest educational category in every country except Australia. Change in smoking prevalence did not start in Australia until 1983, after which it declined equally in both the highest and lowest categories.

In summary, there has been a major decline in smoking prevalence in all the countries studied. Comparison between the countries suggests that in recent times, the United States has had neither the lowest prevalence of smoking nor the fastest rate of decline in smoking. In particular, the rate of decline has been higher in Great Britain and Canada. Lack of change in prevalence among the lower educated is a major barrier to further marked decreases in smoking prevalence in the United States. This suggestion that public health action is not affecting a very sizable proportion of the population is apparent in all countries except Australia. In that country, with its State-based mass media-led campaigns, an equivalent decline was seen in both the highest and lowest educational categories since 1983. However, the lack of change in smoking prevalence in Australia throughout the decade before 1983 may reflect the lack of a clear government focus for smoking and its related health problems. Before 1983, any public health action on smoking came from the voluntary health agencies. The marked change since 1983 reflected the decision by a number of key state governments to act unilaterally and set up well-funded mass media-led antismoking campaigns. Australia still lacks a national bureaucratic structure whose sole responsibility is smoking and health. It

\*Ramstrom L: Personal communication.

is apparent that all countries can benefit from further cross-fertilization of ideas and public health actions between countries. Undoubtedly, there is already considerable contact between public health professionals, from different countries concerned with reducing smoking in their own societies. However, the performance of each country in reducing smoking prevalence over the last 10 years indicates that each country has room for improvement in its public health action and suggests that interventions may not be diffusing across countries as rapidly as is either possible or desirable.

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#### APPENDIX Educational Levels of Smokers in Five Developed Countries

Educational Level	United States	Australia	Canada	Norway	Sweden
High					
Group 1	College graduate	University graduate	College graduate	University graduate	Highest third
Group 2	Some college	Post-secondary	Post-secondary		
Medium	High school graduate	Any secondary certificate	High School No post-secondary	Junior and Senior High	Middle third
Low	Less than high school graduate	Primary	Less than high school graduate	Primary	Lowest third

SOURCES: United States: Pierce, *et al*.<sup>5</sup>  
Australia: Hill, personal communication  
Canada: Millar<sup>12</sup>  
Norway: Lund, personal communication  
Sweden: Ramstrom, personal communication