



SMOKING PREVALENCE AMONG WOMEN IN THE EUROPEAN COMMUNITY 1950–1990

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Abstract—The paper reviews trends in tobacco use among women in the European Community (EC) between 1950 and 1990. The data suggest that EC countries occupy different points on what appears to be a common prevalence curve. Southern EC countries are represented in the early phases of this curve, marked out by sharply rising prevalence. In northern EC countries, female smoking prevalence appears to have peaked. Across the EC, the commodification of tobacco use, and the production and promotion of manufactured cigarettes in particular, underlies this prevalence curve. Young women in higher socio-economic groups have led the way into cigarette smoking in both northern and southern Europe, with smoking prevalence declining first among women who are privileged in terms of their education, occupation and income. Because the decline in prevalence has yet to be repeated among women in more disadvantaged circumstances, cigarette smoking among women in the EC is likely to become a habit increasingly linked to low socio-economic status. Copyright © 1996 Elsevier Science Ltd

Key words—women, cigarette smoking, European Community, socio-economic groups.

INTRODUCTION

By the nineteenth century, tobacco use in Europe had become a strongly gendered pattern of behaviour. The evidence points to low reported use of tobacco among women up until the early decades of this century. However, the late twentieth century has seen a profound change in female smoking habits in the European Community (EC). All member states have recorded an increase in smoking prevalence among women. The increase began earlier in northern European countries, where prevalence has now peaked. In most southern European countries, the proportion of women who smoke is still increasing.

The paper reviews these trends in tobacco use among women. It draws on surveys conducted between 1950 and 1990 to map out patterns of smoking prevalence in the 12 countries with EC membership in 1990. Information on Germany is derived from surveys conducted prior to unification and therefore refers to the former Bundesrepublik Deutschland (B.D.).

The paper is divided into three sections. The section below notes the limitations of the data on smoking prevalence before describing the patterns revealed in these data. The subsequent sections outline the trends in women's smoking in northern EC countries, focusing on Denmark, the Netherlands and the U.K. where historical data are most extensive. The paper then turns to review trends in the south of the EC. Because smoking habits have been more extensively surveyed in Italy and Spain than in other Mediterranean countries, the changing

patterns are illustrated with particular reference to these two member states.

The evidence suggests that trends in women's smoking broadly follow the trajectory described by Rogers and Shoemaker in their analysis of the diffusion of innovations [1, 2]. They suggest that the process by which new ideas and practices enter, and are diffused within, societies is a socially-differentiated one. Innovations tend to be taken up first by individuals and communities marked out by their relative advantage in terms of educational level, socio-economic status and upward social mobility. Although age is often a key variable in the process of diffusion, Rogers and Shoemaker suggest that the relationship is not a constant one: either younger or older age-groups can be over-represented among the early adopters. The process of diffusion spreads outwards from these groups to a point where, once a threshold of prevalence has been reached, there is a rapid increase in the rate of adoption. Thereafter, prevalence rates plateau and decline as new ideas and practices spread and the older innovation becomes restricted to groups who adopted it relatively late in the diffusion process.

LIMITATIONS OF THE DATA ON FEMALE SMOKING PREVALENCE IN THE EC

The development of cross-national perspectives on women's smoking in the EC is hampered by the paucity of research and by problems of the comparability and the validity of the data it

produces. These three problems are discussed briefly in turn.

Firstly, the sample surveys which record smoking prevalence among men and women have a recent history. Even in countries which saw an early initial rise in women's smoking, tobacco use was not routinely surveyed until the late 1940s (U.K.) and 1950s (Denmark and the Netherlands). With the exception of Italy, most of the evidence on southern European countries relates to the last two decades. In these countries, regional and local surveys are a key data-source, particularly on sub-groups like young women and expectant mothers whose behaviour provides an insight into underlying trends in women's smoking. However, both regional and urban-rural differences in smoking behaviour in southern EC countries caution against extrapolating national patterns from these surveys. National prevalence estimates can, however, be derived from Eurobarometer surveys carried out under the aegis of the Commission of European Communities (CEC) since 1984 [3]. Because the national samples used in the Eurobarometer surveys are small, data from annual surveys are aggregated to provide more reliable estimates of prevalence in member states [4].

Secondly, there are problems of comparability of data, both across time and between countries. There are differences in the definition of regular smoking and in the range of tobacco products included in smoking surveys. For example, prevalence estimates, in the U.K. and Ireland are based on the consumption of one or more cigarettes (manufactured and hand-rolled) a day while the major sources of data for the Netherlands include the consumption of one or more cigarettes, pipes or cigars a week. Measures of socio-economic position also vary between countries, and include classifications based on women's educational level and occupation as well as those derived from household income and the occupation of the head of household [5-7].

Thirdly, there are problems of the validity of survey estimates of smoking prevalence [8]. Estimates are affected by sample error, particularly in the small, unrepresentative samples which often provide the only source of historical data [9, 10]. The result can be apparently large fluctuations in prevalence rates in time-series data. While larger national surveys can minimize this source of error, response bias and under-reporting reduce the reliability of estimates based on self-reported smoking status. Survey data are known to underestimate both prevalence and consumption, with the scale of underestimation varying between countries and across time [11, 12]. There is some evidence to suggest that, as smoking becomes more socially censored and publically regulated, under-reporting increases. For example, in a review of data on smoking in Italy, La Vecchia concluded that

the apparent fall in consumption during the early 1980s reflected changes in attitudes towards the reporting of smoking in Italy rather than real changes in smoking habits [13]. The scale of under-reporting is also known to vary between population sub-groups, with young people, expectant mothers and ex-smokers more likely to mask the fact and scale of their tobacco use than other groups [7, 10, 13].

Given the limitations of the data on smoking prevalence, conclusions about trends in women's smoking must be cautiously drawn. It needs to be recognised that future research may uncover dimensions of female tobacco use that are obscured in the currently-available data.

The patterns revealed in the available data are indicated in Table 1. They suggest a wide variation in male and female prevalence rates in EC countries. Overall prevalence rates suggest no consistent differences between the north and south of the Community, with member states from both regions represented at the top of the table. However, when male and female prevalence rates are disaggregated, broad regional patterns emerge. Northern EC countries, including Denmark, Ireland, the Netherlands and the U.K., are marked out by relatively high prevalence rates among women and by low gender ratios. Southern EC countries, including Greece, Italy, Portugal and Spain, are characterized by low female prevalence rates and sharp gender differences in smoking habits.

While north-south differences are neither consistent nor clear-cut, they provide a broad framework in which to review the evidence on women's smoking in the EC. The two sections below look in turn at trends in prevalence in northern member states (Belgium, the former B.D., Denmark, Ireland, the Netherlands and the U.K.) and in the Mediterranean fringe countries of the EC (Greece, Italy, Spain and Portugal). Data illuminating the changing patterns of women's smoking in France are discussed at appropriate points in each section. Trend-data are difficult to derive from the divergent estimates of prevalence produced in French surveys,

Table 1. Proportion of smokers aged 15 + by sex in EC member states, 1987-1989

	Total	Men	Women
Denmark	45	46	45
Greece	43	51	26
Netherlands	42	47	37
Spain	40	53	28
Belgium	36	41	28
France	36	44	29
Ireland	35	38	31
U.K.	35	40	32
Germany (B.D.)	34	43	27
Luxembourg	34	38	30
Italy	32	39	26
Portugal	28	46	12

Note: definition of smoking includes cigarettes (manufactured and hand-rolled) and other tobacco products (cigars, cheroots, pipes etc). Source: Ref. [3], Table 4.

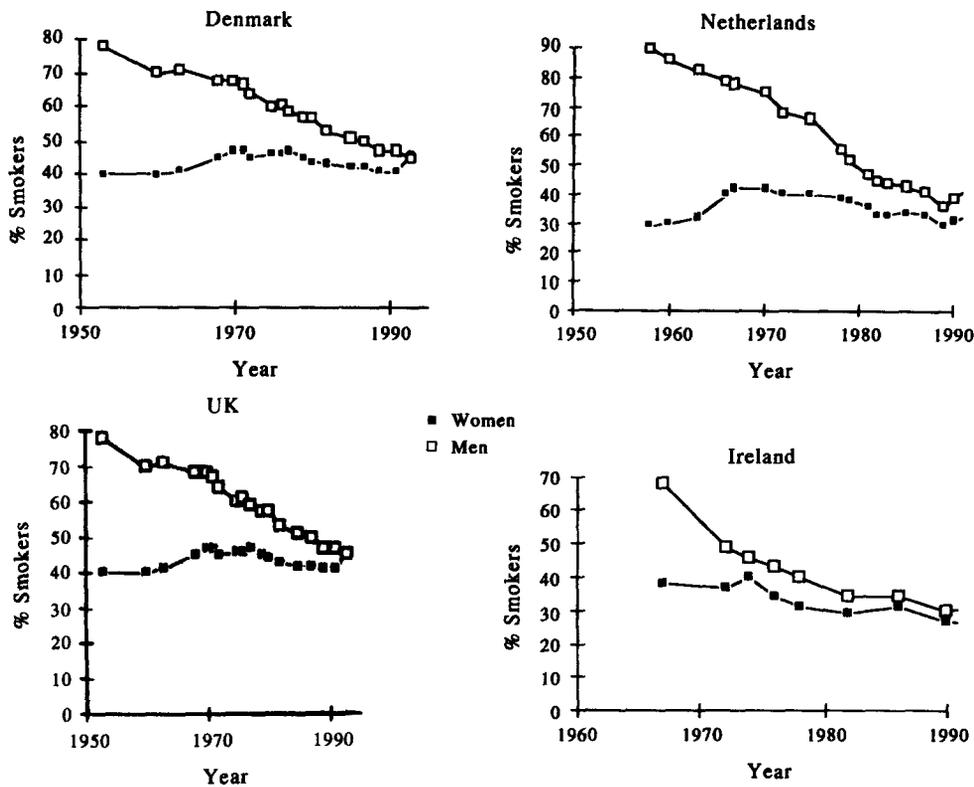


Fig. 1. Smoking prevalence among women and men in Denmark, Netherlands, Ireland and the U.K., 1950–1993 (all tobacco products). Notes: prevalence data for Ireland from 1972 refer to cigarette smoking only. Sources: Refs [3–6, 8, 20, 31].

a problem likely to reflect the high prevalence of occasional smoking in both men and women and compounded by a high degree of under-reporting [8].

FEMALE SMOKING PREVALENCE IN NORTHERN EC COUNTRIES

Changes in women's tobacco use

Up until the beginning of the twentieth century, tobacco use in northern Europe was restricted to traditional tobacco products. These included tobacco for pipes, hand-rolled cigarettes and snuff, together with cigars, cheroots and cigarettes [7, 8, 14, 15, 16]. The tobacco in these products was dark tobacco, cured by air, sun or fire. The limited evidence suggests that both women and men consumed these traditional tobacco products in the seventeenth and eighteenth century. However, through the nineteenth century, tobacco use became increasingly gendered [16]. By the late nineteenth century, most ethnic and religious groups regarded tobacco use as an inappropriate behaviour for women and reported use by women was rare. At the beginning of the century in the Netherlands, for example, one in four (26%) boys aged six and seven were reported to be smokers; among girls, smoking was virtually unknown [17]. In the U.K. in 1907, men consumed an average of 3.1 kg of tobacco a year while consumption among women was below recordable levels [18].

From the turn of the century, tobacco use was rapidly commodified as manufactured cigarettes entered the tobacco markets of northern Europe. The result was a rapid increase in the consumption of manufactured cigarettes and in per capita tobacco consumption, an increase fuelled by the development of blond (flue-cured) tobacco and under-written by advertising [17, 18]. The evidence suggests that it was men who provided the market for the new tobacco product, with prevalence surveys in Denmark, the Netherlands and the U.K. recording high smoking prevalence rates among men in the post-war decades. In the 1950s, over 75% of men in Denmark and the U.K. were smokers; in the Netherlands, the proportion was over 90% [20]. Male prevalence rates in the 1950s were lower in Ireland, Belgium and the former B.D. [20, 21]. Manufactured cigarettes were the most popular form of tobacco-smoking among men, although traditional tobacco products, like cigarillos, pipes and hand-rolled cigarettes, remained the habit of a minority of male smokers [10, 18, 22].

High rates of cigarette smoking among men provided the context for a rapid increase in smoking prevalence among women in most northern EC countries. In line with the diffusion process outlined by Rogers, changes in prevalence describe a curvilinear trajectory [1]. In the U.K., Denmark, Ireland and the Netherlands, low and relatively stable rates of women's smoking gave way to a rapid rise in

prevalence, against a backdrop of high but declining rates of male prevalence. In these countries, female prevalence climbed sharply to reach a peak of over 40% before beginning a gradual decline (Fig. 1). In Belgium and the former B.D., the prevalence curve has been flatter. In Belgium, for example, prevalence climbed from 12% in 1950 to a peak of 28% in 1982 before declining to its current rate of 19% [23]. A clear historical trend among women is less discernible in the French survey data, but they point to a downward trend in male smoking prevalence (Fig. 2).

The rise and gradual fall of women's smoking has been based almost entirely on manufactured cigarettes [8]. However, within the overall domination of the female tobacco market by manufactured cigarettes, there are important national variations. In the U.K. and Ireland, traditional forms of tobacco use, including hand-rolled cigarettes, have remained the habit of only a small minority of women smokers [15, 18]. In contrast, in Denmark, women have smoked and continue to smoke non-cigarette tobacco. When tobacco use peaked among Danish women in the early 1970s, one in five female smokers reported that they were smoking non-cigarette products, with prevalence of non-cigarette smoking rising sharply with age [8]. The proportion has fallen sharply since then [24]. The small minority of female non-cigarette smokers are predominantly cheroot-smokers [22].

Because the trends in women's smoking have occurred across a period in which male smoking prevalence rates have been declining, women make up an increasing proportion of the shrinking population of smokers in northern Europe. In Belgium, France, Ireland and the Netherlands, the gender gap is narrowing, while surveys in the U.K. and Denmark suggest that gender parity has now been reached [4, 7] (Fig. 1 and Fig. 2). Similar trends in smoking prevalence are recorded in other industrial capitalist countries, including the U.S., Canada, Australia, New Zealand and Scandinavia [25].

Changes in the age structure and social composition of the female smoking population

The evidence suggests that the prevalence curve in women's smoking is shaped by changes in the composition as well as the size of the female smoking population. Both the upward and downward phase of the curve appears to reflect a diffusion process led by younger women and by women from more advantaged backgrounds. Evidence from the Netherlands and the former B.D. illustrate the impact of changes in the smoking behaviour of these groups of women in the early phases of the prevalence curve.

Taking the Netherlands first, surveys point to marked differences in age-prevalence rates among women in the 1960s and early 1970s, when prevalence

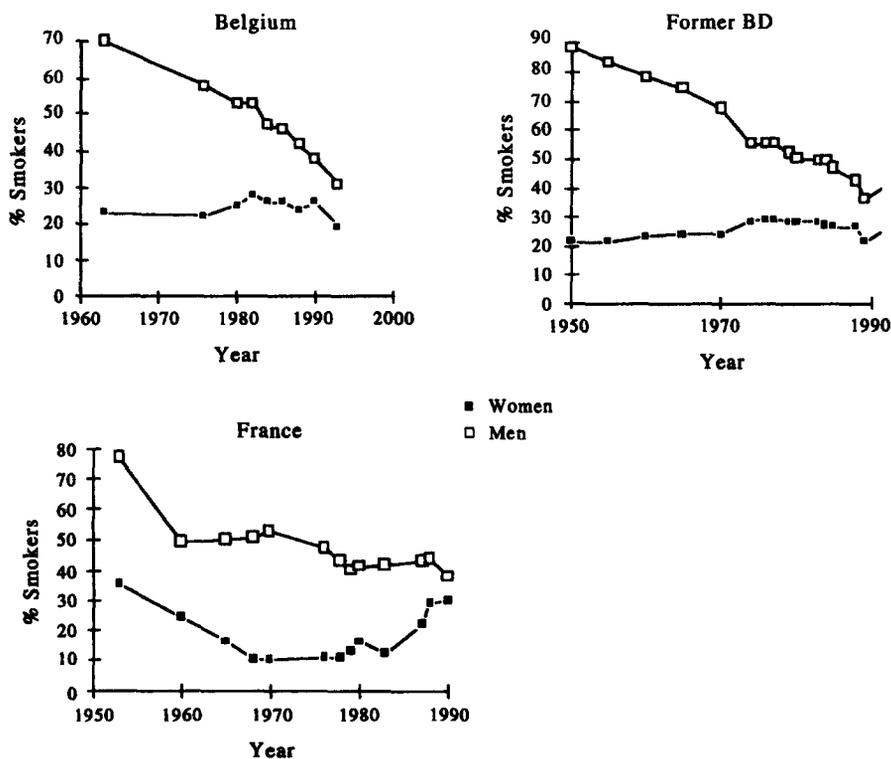


Fig. 2. Smoking prevalence among women and men in former B.D., Belgium and France, 1950–1993 (all tobacco products). Sources: Refs [3, 4, 20, 23].

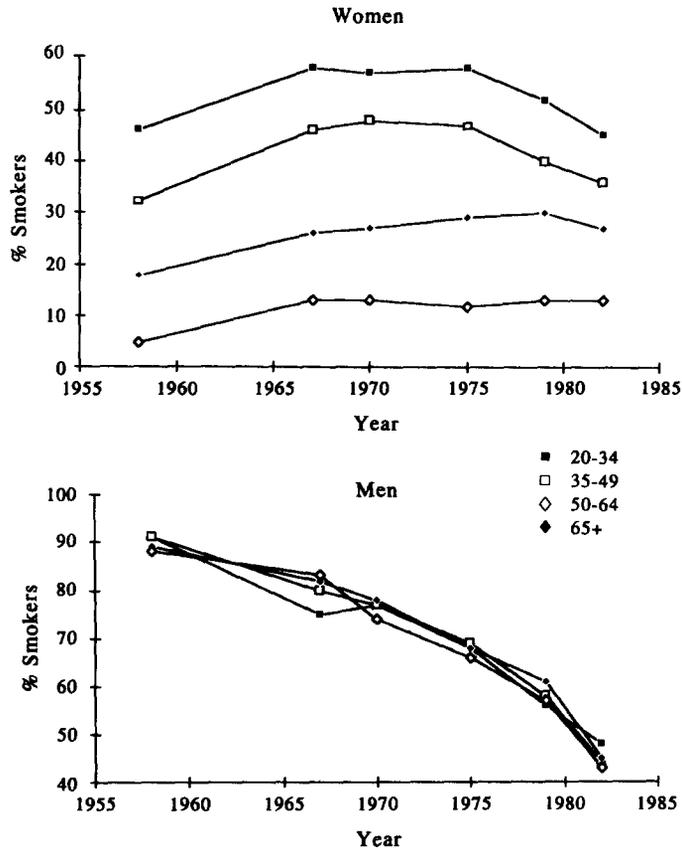


Fig. 3. Age prevalence of smoking among women and men aged 20 and over, Netherlands, 1958–1982. Source: Ref. [26], Table 1.

rates among women were rising. In 1958, overall smoking prevalence among women stood at 29%. However, women aged 20–34 had a prevalence rate (46%) which was 2.5 times that reported among women aged 50–64 (18%). While these differences narrowed over time as younger cohorts aged, they remained a marked feature of women's smoking patterns across the period. In contrast, a similar proportion of men above the age of 20 reported that they were smokers, with high prevalence rates declining in a uniform way across the age-cohorts [26]. These gender differences in age-prevalence rates are described in Fig. 3.

The increase in smoking prevalence among Dutch women has also been associated with changes in the social background of smokers. In the 1950s, when prevalence rates were rising, female smoking was associated with having more years of education and with living in an urban rather than a rural area. Smoking prevalence was also significantly related to religion, with Protestant women reporting lower rates of smoking than other women [26]. The association between cigarette smoking, education and urban living among women disappeared in the 1960s, to be replaced by a reverse socio-economic gradient in women's smoking. The emergence of a negative association between socio-economic status and

smoking among women has been dated to the early 1970s, a decade after a negative association appeared among men [27].

Smoking prevalence among women in the former B.D. is significantly lower than in the Netherlands. Nonetheless, the evidence points to a similar process of diffusion. Tobacco use was very uncommon among women born before 1920. In this cohort, around 5% reported that they were smokers by the age of 20. Smoking prevalence increased substantially among women born in successive cohorts from 1920 to 1960, and the age of onset of regular smoking fell in each successive cohort. Among women born in the 1950s, 50% were smokers by the age of 20. As in the Netherlands, it was better-educated women in the former B.D. who were the innovators and early adapters in the early phases of the smoking epidemic. Among women born in the 1920s, smoking prevalence in early adulthood (and therefore across the lifespan) was significantly higher among women with > 9 years of school education [28]. Among later cohorts, these educational and socio-economic differences have narrowed. Women's smoking has taken on the class profile already strongly in evidence among men, with lower prevalence rates found among the higher class groups [29].

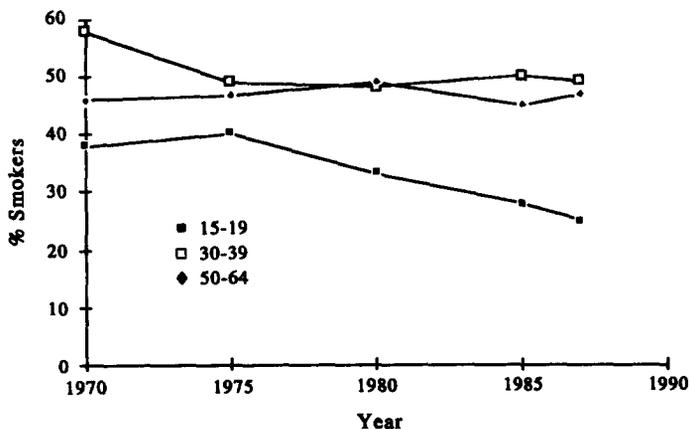


Fig. 4. Age prevalence of smoking among women aged 15 and over, Denmark, 1970–1987. Source: Ref. [31], Table 2.

As with the initial increase in smoking prevalence, the trend away from cigarette smoking has been a socially-differentiated one and one influenced by the impact of publicity and education on the health-effects of smoking [5, 30]. However, age and cohort differences do not show the consistent pattern which characterized the early adoption of cigarette smoking in northern EC countries. In some countries, including Belgium, Denmark and the Netherlands, younger women recorded a sharper decline in prevalence through the 1970s and 1980s than women in older age groups [8, 18, 31]. Fig. 4 describes the age-specific prevalence rates for women in Denmark across this period. In other countries, including the U.K. and Ireland, this age gradient has been less pronounced, with a more uniform rate of decline

across the age groups as prevalence fell from its peak in the mid-1960s [7, 15].

The evidence on socio-economic status points to a more consistent pattern. Surveys in the Netherlands and the former B.D. indicate that women on the higher rungs of the educational and occupational ladder have turned away from smoking earlier and in larger numbers than women in less advantaged circumstances [26, 29]. Evidence from Denmark and the U.K., where the changing socio-economic profile of women's smoking has been mapped in more detail, suggests that the decline in female prevalence has been sustained almost entirely by women in higher socio-economic groups. In Denmark, smoking prevalence among women in higher non-manual occupations fell by over a third (34%) between 1970

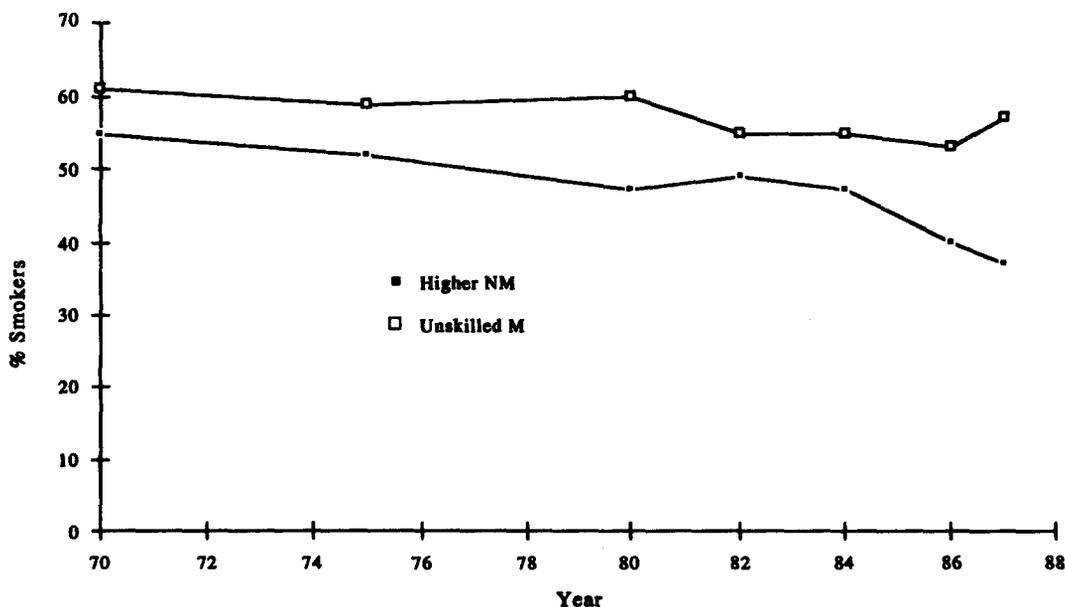


Fig. 5. Smoking prevalence among women aged 15 and over by occupational groups, Denmark, 1970–1987. Source: Ref [31], Table 2.

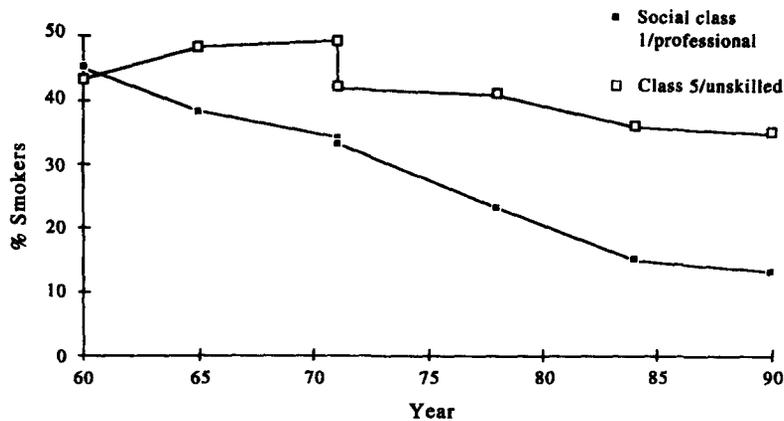


Fig. 6. Cigarette smoking prevalence among women aged 16 and over by social class, Britain 1950-1990. Notes: (1) married/cohabiting women classified on the basis of occupation of head of household; (2) 1950-1972 data based on manufactured cigarettes by social class; 1972-1990 data based on hand-rolled and manufactured cigarettes, by socio-economic group. Sources: Ref. [7], Table 4.9 and Ref. [8], Table 5.2.

and 1987; among women in unskilled manual occupations, prevalence fell by 5% across the same period. By 1987, tobacco use had become a minority habit among women in higher non-manual groups, where smoking prevalence stood at 37%. In contrast, the majority (57%) of women in the lowest occupational groups were still smokers (Fig. 5).

In the U.K., there is similarly pronounced class differential in the rate of decline of smoking prevalence among women. In the early 1960s, around 40% of women in all social classes were smokers [18]. By the early 1990s, smoking prevalence among women in the highest socio-economic group had fallen to 13%. However, 35% of women in the lowest socio-economic group (unskilled manual) were still smokers (Fig. 6). Prevalence has also remained high among other groups in the U.K. where material and social disadvantage is concentrated. For example, estimates of smoking prevalence among lone mothers suggest that 60% were smokers in the early 1970s, a proportion that has not declined significantly since [32, 33].

FEMALE SMOKING PREVALENCE IN SOUTHERN EC COUNTRIES

Changes in women's tobacco use

The limited evidence suggests that the use of tobacco by women in southern Europe was not socially sanctioned in the eighteenth and nineteenth centuries [16]. Whiff smoking (snuff) and the smoking of hand-rolled cigarettes by women was reported in nineteenth century Portugal and Spain [16, 34]. However, evidence from Spain, Italy and France indicates that female tobacco use was a minority habit by the early decades of the twentieth century. For example, regional surveys suggest that, among Spanish women born before 1910, smoking prevalence among 25-29 year olds did not reach recordable

levels. Among Italian and French women in the same birth cohort, around 1 in 20 reported that they were smokers at the age of 25-29. In contrast, the majority of Spanish, Italian and French men born before 1910 reported that they were smokers by this age. In this age-cohort, male smoking prevalence was typically over 60% [35].

Spanish, Italian and French women born before 1910 were reaching early adulthood at a time when traditional tobacco products were the dominant forms of tobacco use. In Italy in the early 1920s, tobacco for smoking, cigars and snuff represented 60% of all tobacco consumed (by weight); in Spain, 80% of the tobacco consumed was in the form of smoking tobacco and cigars. In 1930s France, smoking tobacco, snuff, chewing tobacco and cigars represented over 60% of tobacco consumed [19]. However, smoking habits changed rapidly during the middle decades of the century as men abandoned these traditional products in favour of manufactured cigarettes. By 1930, most of the tobacco consumed in Italy was in the form of manufactured cigarettes. The pattern was repeated in France in the late 1940s and in Spain in the 1950s. The shift towards manufactured cigarettes was typically associated with a sharp increase in per capita tobacco consumption. In Portugal, for example, where manufactured cigarettes emerged as the market leader in the 1940s, consumption of manufactured cigarettes increased by 158% between 1940 and 1950 [19].

While the data provide only an approximate guide to underlying trends, they suggest that cigarette smoking among women is a relatively recent phenomenon in southern Europe. Surveys point to prevalence rates of 10% or less up until the late 1960s in Italy, the 1970s in Spain and Greece and the 1980s in Portugal, with a sharp increase since then [8, 20, 36-38]. As Fig. 7 indicates, southern EC countries appear to be at an earlier stage of the

prevalence curve that has characterized women's smoking in northern Europe.

In contrast to northern Europe, the new market for manufactured cigarettes has been less exclusively based on blond tobacco. The limited evidence suggests that men switched from traditional forms of dark tobacco use (hand-rolled cigarettes and pipes) to manufactured dark tobacco. Data from France for the early 1980s suggest that seven in ten male cigarette smokers (including hand-rolled cigarettes) smoked dark tobacco [39]. A regional survey of France, Spain and Italy conducted in the mid-1980s suggest a similar pattern. In the Spanish sample, over 70% of the older male smokers reported smoking hand-rolled cigarettes and in this group, nearly 100% used dark tobacco cigarettes. Among younger men, manufactured cigarettes were the dominant form of tobacco use. Again, however, the majority (over 70%) smoked dark tobacco cigarettes. The evidence points to a trend away from dark tobacco use among younger cohorts of men in France, Italy and Spain [35, 36].

As in northern Europe, the rapid rise in smoking prevalence among women reflects the increasing popularity of cigarette smoking, through a diffusion process in which women adopted habits already established among men. The data suggest that female smokers were more likely than male smokers to

smoke blond tobacco cigarettes [8]. However, a significant proportion of female smokers in France report smoking dark tobacco. Data for the early 1980s indicate that dark tobacco brands were most commonly consumed by 50% of female smokers [39, 40]. In the regional survey of France, Italy and Spain noted above, exclusive use of dark tobacco was around 50% among French female smokers. Lower rates were reported by Spanish women, while exclusive dark tobacco use was rare among female smokers in Italy [36].

Changes in the age structure and social composition of female smokers

The process of diffusion has mirrored trends in northern EC countries, with the innovators and early adapters concentrated among young women and among women in urban areas in higher educational and occupational groups. Surveys in France, Greece, Italy, Spain and Portugal confirm that smoking prevalence displays a sharp age gradient [8, 36, 40–42]. Fig. 8 maps the age-profile uncovered in surveys in Greece, Italy and Portugal in the mid-1980s.

As prevalence rates among young women rise, gender differences in these age-groups narrow. Prevalence rates among school-aged girls in France match those found among boys [43]. In Spain, regional surveys of school children again suggest that

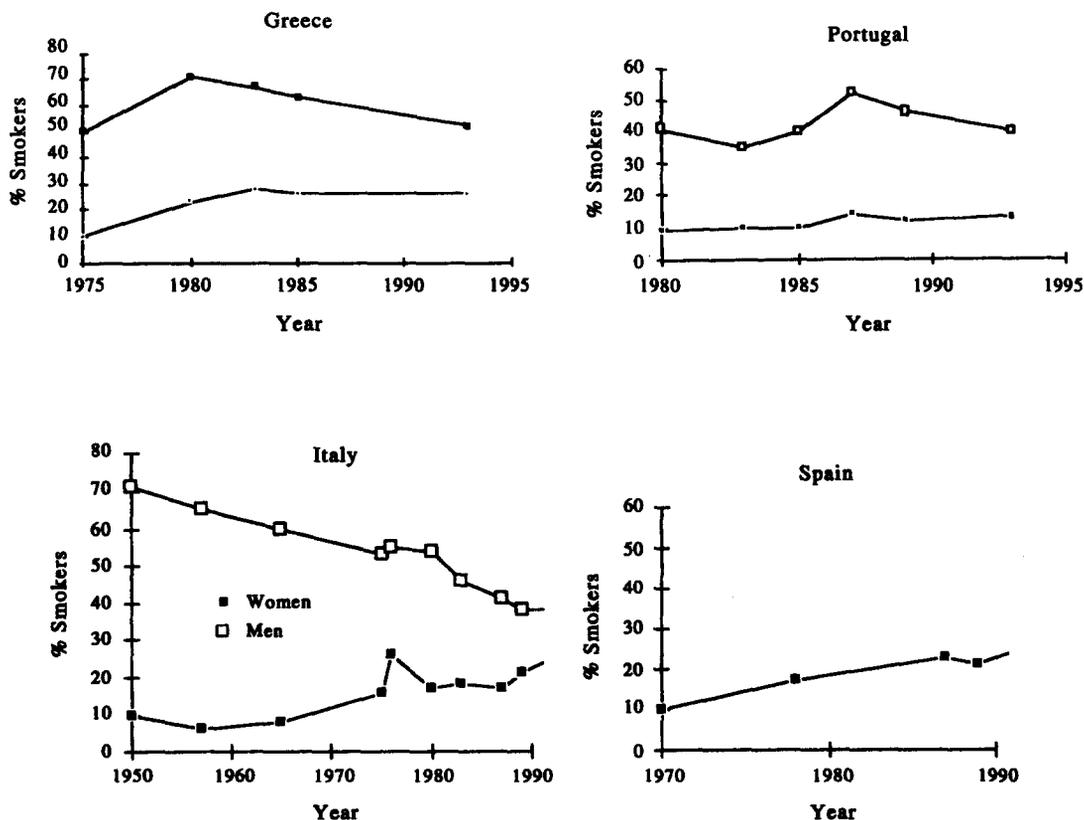


Fig. 7. Smoking prevalence among women and men in Greece, Italy, Portugal and Spain, 1950–1993, all tobacco products. Source: Refs [3, 4, 20, 36, 42].

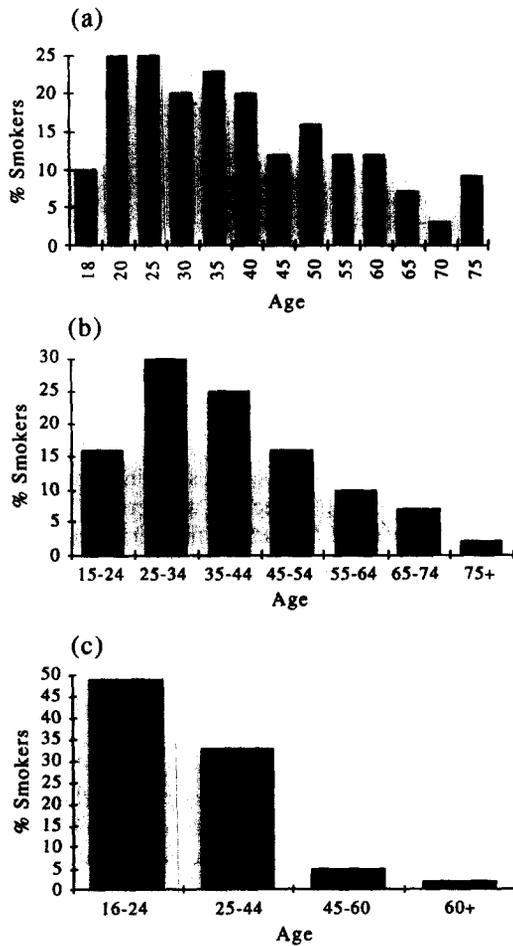


Fig. 8. Age prevalence rates of smoking for women in (a) Greece (Athens), 1980s. (b) Italy; 1980-87 and (c) Spain, 1987. Source: (a) Ref. [41], Table 4 (b) Ref. [35], Table 4 (c) Ref. [42] Figure 1.

the traditional gender differences in smoking behaviour have disappeared [44, 45]. Because smoking prevalence rates drop sharply with age, overall prevalence rates are set to rise in southern Europe as younger cohorts move into and through adulthood.

The picture of increasing smoking prevalence among women is confirmed in surveys of expectant mothers. A national survey of expectant mothers in Italy in 1989 found a prevalence rate of 26% at the time of conception. Prevalence was age-related with the highest rate (36%) reported among women under the age of 20 [46]. Regional surveys of smoking in pregnancy in Spain have uncovered rates of prevalence which are higher than those reported by young women in the wider population. In a regional survey in Valencia, 60% of expectant mothers reported smoking at least one cigarette a day prior to pregnancy; among expectant mothers under the age of 20, the prevalence rate stood at over 80% [47]. However, the evidence suggests that high smoking prevalence rates prior to pregnancy are matched by high smoking cessation rates during pregnancy. A

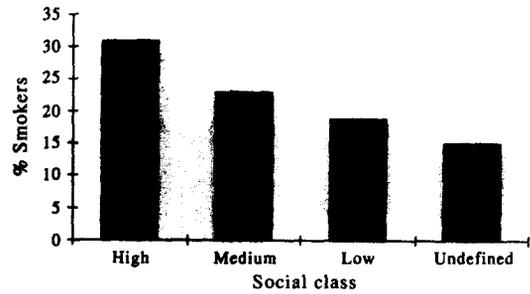


Fig. 9. Age-adjusted smoking prevalence among Italian women aged 15 and over, by social class based on own occupation, Italy, 1986. Source: Ref. [35], Table 6.

consistent finding of surveys in Greece, Italy and Spain is of higher quit rates among expectant mothers than those reported in northern EC countries [46-49].

Turning from age to socio-economic status, patterns in southern Europe again appear to be conforming to trends established in northern countries and following the trajectory described by Rogers and Shoemaker [1, 2]. Surveys in France, Greece, Italy and Spain point to significantly lower prevalence rates among women in rural areas than among urban and city-living women [35, 36, 38, 50]. Similar urban-regional differences have been recorded among expectant mothers in these countries [50, 51].

Surveys have also uncovered a clear and positive socio-economic gradient in women's smoking. In Italy, national data indicate that women in higher social class groups and with more years of schooling are more likely to smoke than women with less advantaged class and educational backgrounds [35, 36, 52] (Fig. 9). Greek and Spanish surveys have uncovered a similar class gradient in women's smoking. A survey of smoking in pregnancy in Ioannina, a region in Greece spanning both urban and rural areas, points to sharp class differences in smoking behaviour, with prevalence rates declining from 21% among women in the highest class group to 10% among women in the lowest class group [53]. Similarly, in Spain, prevalence rates are significantly higher among women with university education than among women with primary-level schooling only

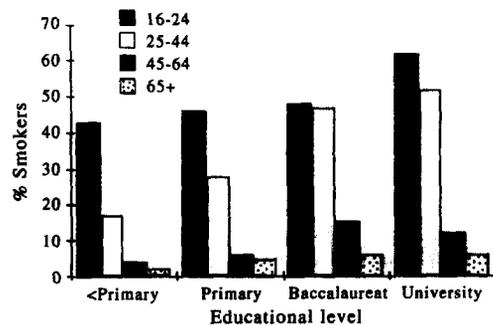


Fig. 10. Female smoking prevalence by age and educational level, Spain, 1987. Source: Ref [42], Figure 3.

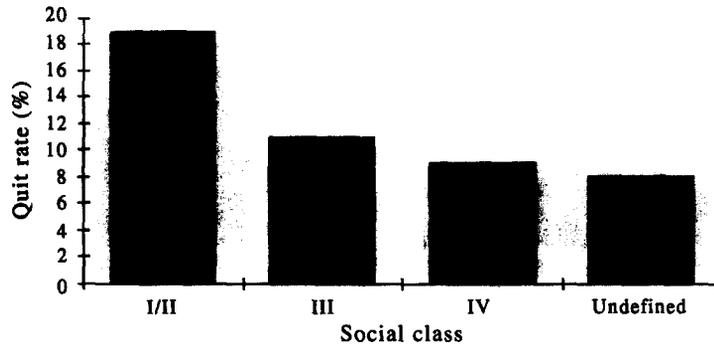


Fig. 11. Age adjusted quit rates among women by social class, Italy, 1983. Note: social class is based on subject's occupation. Source: Ref. [52], Table 1.

(Fig. 10). A similar gradient emerges when income rather than education is taken as the measure of socio-economic status, with women in households on the highest incomes reporting the highest prevalence rates [46].

Reflecting this positive class gradient, surveys have uncovered a prevalence rate among nurses which is significantly higher than the overall female prevalence rate. In France in the early 1980s, survey data pointed to a prevalence rate of 65% among nursing students compared with a national prevalence rate of 25% among women [54]. In Spain in the late 1980s, 23% of the female population but over 60% of nurses reported that they were regular smokers [55, 56]. Similar differences have been noted in Italy. In a 1986 survey, female hospital staff were found to have a prevalence rate which was over 40% higher, after age-standardization, than the national female prevalence rate. In contrast, prevalence rates among male hospital staff were lower than those reported in the wider male population [57].

Surveys of health personnel, like those of the general population, point to a positive class gradient in women's smoking in south EC countries. However, there is evidence to indicate that the class distribution of women's smoking is changing. The evidence suggests that, while prevalence continues to be positively related to high socio-economic status, cessation is also positively related to social and material advantage. Surveys in Spain, Italy and France report higher quit ratios among women in richer, urban areas than poorer rural areas [36, 52].

The 1983 and 1987 National Health Surveys (NHS) in Italy provide a detailed picture of the socio-economic correlates of smoking cessation. The 1983 survey uncovered significantly higher quit rates among women in social class I and II than among women in social class IV and V (Fig. 11). Similarly, cessation rates were significantly higher among university-educated women than among women with no or primary-level schooling [52]. The 1987 NHS confirmed these socio-economic differences in cessation among women, a pattern also evident among men [35].

A socio-economic gradient in smoking cessation is also evident among expectant mothers in Italy. A national survey of expectant mothers found that cessation was positively and significantly related to years of education [46]. The patterns among Spanish women are less clear-cut. To date, the evidence suggests no consistent relationship between smoking cessation and such measures of socio-economic status as education, occupation and income. However, among expectant mothers, there is evidence that rates of smoking cessation are lower among lone mothers and mothers with no or only primary-level education [47]. The overall weight of evidence thus indicates that the trends which have marked out the decline in smoking prevalence in northern Europe are set to be repeated in the southern member states of the EC.

CONCLUSIONS

The paper has reviewed the patterns of smoking prevalence among women in the EC. While there are wide variations in point-prevalence rates between member states, the data suggest that these variations reflect similarities in underlying trends. EC countries occupy different points on what appears to be a common prevalence curve. The curve is characterized by a steep initial rise in prevalence before the proportion of female smokers levels off and begins a slow decline. Southern EC countries are represented in the early phases of this prevalence curve, marked out by rising prevalence. In northern EC countries, including France and the former B.D., smoking prevalence among women appears to have peaked.

While the paucity of data cautions against drawing firm conclusions, the evidence points to a common process of diffusion and one that conforms to the model identified by Rogers and Shoemaker [1, 2]. Across the EC, the commodification of tobacco use and, in particular, the production and promotion of manufactured cigarettes, has preceded the adoption of smoking among women. It is young women in higher socio-economic groups who have led the way into cigarette smoking in both the northern and southern regions of the EC. Similarly, smoking

prevalence rates appears to fall first among women who are privileged in terms of their education, occupation and income levels. However, the evidence from northern Europe suggests that the diffusion process with respect to declining prevalence is a truncated one. The decline in prevalence achieved among women in higher socio-economic groups has yet to be repeated among women in more disadvantaged circumstances. As this class-differentiated pattern is repeated in southern Europe, cigarette smoking among women in the EC will become a habit increasingly linked to socio-economic disadvantage.

The trends in tobacco use mapped out in prevalence surveys are reflected in changes in tobacco-related morbidity and mortality among women. Tobacco-related mortality rates are rising among women in the EC, and the rate of increase is now outstripping that recorded among men [58]. The highest rates of lung cancer deaths among women are recorded in countries which experienced an early rise in female smoking prevalence. Denmark and the U.K. head the league table of female deaths from malignant neoplasm of the lung, trachea and bronchus, with mortality rates of 45.5 per 100,000 and 42.7 per 100,000, respectively [59]. However, countries with traditionally low rates of female lung cancer mortality, like France and Italy, have recorded a sharp increase over the last decade [59, 60]. Portugal and Spain have the lowest death rates from cancer of the lung, trachea and bronchus in the EC. Mortality rates among women from these diseases are relatively stable and currently stand at 8.6 per 100,000 in Portugal and 6.4 per 100,000 in Spain [59, 60]. Morbidity data, however, suggest that death rates are set to climb. In Spain, the rate of hospitalization of women with lung cancer increased by 100% between 1980 and 1987 [42].

The trends in tobacco-related illness among women underline the importance of tobacco control and health promotion policies which address the factors that encourage and sustain high prevalence rates among women in Europe [61, 62]. The lessons from northern Europe provide a case-study on which a strategic EC-wide approach can be built. As southern EC countries move through a process of diffusion that has marked out the history of women's smoking in northern Europe, there is a particular and urgent need to identify strategies to reduce the rate of recruitment of young women into cigarette smoking and to enable those in more materially-disadvantaged circumstances to match the rates of decline in prevalence achieved by women in higher socio-economic groups.

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REFERENCES

1. Rogers E. *Diffusion of Innovations*. Collier Macmillan, London, 1962.
2. Rogers E and Shoemaker F. *Communication of Innovations: A Cross-cultural Approach*. Collier Macmillan, London, 1971.
3. European Bureau for Action on Smoking Prevention *Tobacco and Health in the European Union: An Overview*. EBASP, Bruxelles, 1994.
4. Commission of the European Communities. *Europeans and the European Code Against Cancer: Findings of the Eurobarometer Survey in March/April 1989*. CEC, Brussels, 1989.
5. Van Reek J. (1994) Smoking behaviour in the Netherlands and the United Kingdom: 1958–1982. *Rev. Epidem. Santé Publ.* **32**, 383.
6. Health Promotion Unit. *Information on Smoking*. Department of Health, Dublin, 1995.
7. Office of Population Censuses and Surveys. *General Household Survey 1992*. HMSO, London, 1994.
8. Nicolaidis-Bauman A., Wald N., Forey B. and Lee P. *International Smoking Statistics*. Oxford University Press, London, 1993.
9. Merdoft J., Reuter V. and Welsch G. *Daten und Fakten zur Entwicklung des Rauchens in Mitgliedsländern der Europäischen Gemeinschaften*. Luzembourg, EEG, 1992.
10. Todd G. *Statistics of Smoking in the Member States of the European Community*. Commission of the European Communities, Brussels, 1986.
11. Todd G.F. (1978) Cigarette consumption per adult of each sex in various countries. *J. Epidemiol. Commun. Hlth* **32**, 289.
12. Jackson R. and Beaglehole R. (1985) Secular trends in under-reporting of cigarette consumption. *Am. J. Epidemiol.* **122**, 341.
13. La Vecchia C. (1986) Smoking in Italy, 1949–1983. *Prevent. Med.* **15**, 274.
14. Adrianse H., Van Reek J. and Metsemaker J. (1986) Smoking behaviour of Dutch general practitioners in the period 1977–1983. *Scand. J. Prim. Hlth Care* **4**, 151.
15. Shelley E. (1985) Slow but steady progress against smoking in Ireland. *N.Y. State J. Med.* **34**, 400.
16. Goodman J. *Tobacco History: The Cultures of Dependence*. Routledge, London, 1993.
17. Van Reek J., Drop M. J. and Joosten J. (1987) The influence of peers and parents on the smoking behaviour of school children. *J. School Hlth* **57**, 30.
18. Wald N. and Nicolaidis-Bauman A. *UK Smoking Statistics*, 2nd edn. Oxford University Press, Oxford, 1991.
19. Lee P. N. *Tobacco Consumption in Various Countries*. Research Paper 6, 4th edn. Tobacco Research Council, London, 1975.
20. Organisation for Economic Co-operation and Development. *OECD Health Systems Facts and Trends 1960–1991*, vol. I. OECD, Paris, 1993.
21. Cleary A., Shelley E., Bourke G. and Graham I. (1983) Smoking and health—the facts in Ireland. *Irish Med. J.* **76**, **12**(suppl), 1.
22. Nielsen P. E. and Krarup N. B. (1976) Tobaksforbruget i Danmark 1920–1975. *Ugeskr. Laeger* **138**, 2411.
23. Smoking Prevention. Belgium: decrease in the number of smokers. *Smoking Prevention*, p. 24. BASP, Bruxelles, 1994.
24. Petersen P. E. (1989) Smoking, alcohol consumption and dental health behaviour among 25–44 year-old Danes. *Scand. J. Dental Hlth* **97**, 422.
25. Pierce J. P. (1989) International comparisons of trends in cigarette smoking prevalence. *Am. J. publ. Hlth* **79**, 152.
26. Van Reek J. (1985) Smoking behaviour in the Netherlands 1958–1982. *Hygie* **4**, 19.
27. Van Reek J. (1983) Rookgedrag in Nederland van 1958–1982. *Tijdschr. Alc. Drugs* **9**, 3, 99.
28. Brenner H. (1993) A birth cohort analysis of the

- smoking epidemic in West Germany. *J. Epidemiol. Commun. Hlth* 47, 54.
29. Helmert U., Kerman B., Joeckel K. H., Greiser E. and Madans J. (1989) Social class and risk factors for coronary heart disease in the Federal Republic of Germany. Results of the baseline survey of the German Cardiovascular Prevention Study (GCP). *J. Epidemiol. Commun. Hlth* 43, 37.
 30. Townsend J., Roderick P. and Cooper J. (1994) Cigarette smoking by socio-economic group, sex and age: effects of price, income and health publicity. *Br. Med. J.* 309, 6959, 923.
 31. Nielsen P. E., Zacho J., Olsen J.A. and Olsen C.A. (1988) Aendringer i danskernes rygevaner 1970-1987. *Ugeskr Laeger* 150, 38, 2229.
 32. Butler N. R. and Golding J. *From Birth to Five*. Pergamon Press, London, 1986.
 33. Marsh A. and McKay S. *Poor Smokers*. Policy Studies Institute, London, 1994.
 34. Nilson-Giebel M. *Women's Lifestyles and Smoking*. Federal Centre for Health Education, Germany, 1985.
 35. Ferraroni M., La Vecchia C., Pagano R., Negri E. and Decarli A. (1991) Smoking in Italy, 1986-1987. *Tumori* 75, 521.
 36. Berroni F., Merlett F., Zubiri A., Del Moral A., Raymond L., Estève J. and Tuyns A. J. (1988) A comparative study of smoking, drinking and dietary habits in population samples in France, Italy, Spain and Switzerland. *Rer. Epidémiol. Santé Publ.* 36, 166.
 37. Merdorf J., Reuter V. and Welsch G. *Daten und Fakten zur Entwicklung des Rauchens in Mitgliedsländern der Europäischen Gemeinschaften*. EGKS-EWG-EAG, Brussels, 1982.
 38. Ministry of Health. *Information Bulletin*, p. 18, Ministry of Health, Athens, 1980.
 39. Tuyns A. J. and Hu M. X. (1982) Smoking patterns in Calvados (France). *Br. J. Addiction* 77, 167.
 40. Wynder E. L., Mushinski M. H., Stellman S. D. and Choay P. (1981) Tobacco usage in France: an epidemiological study. *Prevent. Med.* 10, 310.
 41. Mouloupoulos S. D., Adamopoulos P. N., Diamantopoulos E. I., Nanas S. N., Anthopoulos L. N. and Iliadi-Alexandrou M. (1987) Coronary heart disease risk factors in a random sample of Athenian adults. *Am. J. Epidemiol.* 126, 882.
 42. de Onis M. and Villar J. (1991) La consommation de tabac chez la femme espagnole. *Wld Hlth Stat. Q.* 44, 2, 80.
 43. Sasco A. J., Pobel D., Grizean D. and Danzon M. (1991) Evolution ré cente du tabaquisme des jeunes en France. *Pédiatrie* 46, 555.
 44. Villalbi H. M., Nebot A., Comin B. and Murrillo F. (1990) Consumo precoz de tabaco en escolares. *Rev. San. Hig. Pub.* 64, 613.
 45. Utrillo J. M. G., Ros J. P. and Arguelaget E. P. (1992) Características del tabaquismo en el medio escolar en andorra. *Gac. Sanit.* 6, 122.
 46. Bonati M. and Fellin G. (1991) Changes in smoking and drinking behaviour before and during pregnancy in Italian mothers: implications for public health intervention. *Int. J. Epidemiol.* 20, 927.
 47. Bolumar F., Rebagliato M., Hernandez-Aguado I. and Florey C. du V. (1994) Smoking and drinking habits before and during pregnancy in Spanish women. *J. Epidemiol. Commun. Hlth* 48, 36.
 48. Lekea-Karanika V., Tzoumaka-Bakoula C. and Matsaniotis N. S. (1991) Socio-economic factors associated with pre-term delivery in Greece: a population-based study. *Paediatric Perinatal Epidemiol.* 5, 37.
 49. Comité Français D'Education Pour La Santé. *Les Fumeurs Adultes. Un Sondage exclusif BVA-CFES sur le Comportement des Fumeurs*. CFES, Paris, 1989.
 50. Nakou S. and Antoniadou-Koumatou I. The Greek family today: experience from two populations in Attica. In *Family Care* (Edited by Tsitoura S.), pp. 33-42. Athens, 1990.
 51. Panayotopoulos T. *Health of Preschool Children: Morbidity and Primary Health Care Needs*. Foundation for Research in Childhood, Athens, 1991.
 52. Negri E., Pagano R. and La Vecchia C. (1989) Determinants of stopping cigarette smoking in Italy. *Rev. Epidémiol. Santé Publ.* 37, 337.
 53. Griva R., Tsirka A., Lolis D. and Lapatsanis P. D. Frequency of smoking in pregnant women. Abstract No. 54, 25th National Greek Paediatric Conference, Patra, 1987.
 54. Bittoun R. (1985) Smoking in France: a dismal picture. *N.Y. State J. Med.* 34, 407.
 55. Sanz C., Olalla G., Monge J. V., Soriano L. C., Lopez M. R., Pla M. R. and Pollan S. (1989) Smoking habits: a study of hospital staff. *Revista Clin. Espanola* 185, 8, 391.
 56. Sande M. J. L., Poson C. J. R., Orcajo N. A. and Llorian R. A. (1990) Smoking among health professionals in Asturias. *Revista Espanola De Cardiologia* 43, 219.
 57. Talamini R., Bidoli E., Serraino D., Barra S., Franceschi S. and Bollini P. (1989) Habits and opinions about cigarette smoking among medical, nursing and technico-administrative staff at the Maganta Hospital. *Epidemiologia Prevenzine* 11, 38, 35.
 58. Peto R., Lopez A. D., Bokeham J., Thun M. and Heath R. (1992) Mortality from tobacco in developed countries: indirect estimation from national vital statistics. *The Lancet* 339, 1268.
 59. House of Commons. *Hansard*. 15th December, p. 716, HMSO, London, 1993.
 60. Lopez A. D. Changes in tobacco consumption and lung cancer risk: evidence from national statistics. In *Evaluating Effectiveness of Primary Prevention of Cancer* (Edited by Hakama M., Beral V., Cullen J. W. and Parkin D. M.). International Agency for Research on Cancer, Lyon, 1990.
 61. Chollet-Traquet C. *Women and Tobacco*. World Health Organisation, Geneva, 1992.
 62. Townsend J. The burden of smoking. In *Tackling Inequalities in Health: an Agenda for Action* (Edited by Benzeval M., Judge K. and Whitehead M.). Kings Fund, London, 1995.