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Why Can't We Convince the Young Not to Smoke?*

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Since 1994, Dr Kleihues has been Director of the International Agency for Research on Cancer (IARC), Lyon, France. The Agency has a long-standing interest in the domain of tobacco and cancer and plans to extend its activities increasingly into the area of prevention, including behavioural studies on substance abuse by adolescents. Dr Kleihues was trained in brain research and pathology and has been a Professor of Neuropathology at the University of Zurich, Switzerland, since 1983. His special interest is in tumours of the nervous system.

Tobacco is the largest cause of preventable death and morbidity in the world. Significant progress has been made in national tobacco control programmes, followed by a significant reduction in smoking-associated diseases. However, other populations have taken up the habit and the worldwide surge in cigarette smoking by young people is particularly worrisome. Based on our own experience as well as reported data, we examined determinants of tobacco use, at the familial, peer and societal levels as well as various prevention strategies based on legislation, health promotion and society awareness. Reasons for failures include under-enforcement of legislation, uniform approach to diverse populations

*This review was written in memory of Dr Ernst Wynder (1922–1999), a passionate researcher and public health educator. Author of the 1950 landmark paper demonstrating convincingly the link between tobacco smoking and lung cancer, he dedicated his whole life to cancer research and its translation to effective health promotion. May his message grow amongst scientists and public health experts around the world. Such is the legacy he wanted to leave behind.

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and too limited means. Recommendations for future actions should include integrated policies and health programmes. Most importantly, the society outlook on tobacco should be changed, making non-smoking the norm and the objective.

Key words: tobacco, smoking, youth, girl, boy, prevention, determinant
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INTRODUCTION

TOBACCO HAS been reliably linked to a large variety of diseases. Most recent estimates at the world level amount to an annual death toll of 4 million, projected to increase at current smoking patterns to 10 million around 2030 [1]. The list of diseases for which tobacco is at least partly responsible grows year by year. For cancer alone, many sites are affected including lung, oral cavity, pharynx, larynx, oesophagus, stomach, kidney, bladder, pancreas and cervix. One can, therefore, view the demonstration of the link between tobacco and cancer as one of the greatest achievements of chronic disease epidemiology in the second half of our century. Yet, at the same time, it can be seen as a major failure of public health in the world at large, and particularly in the developing countries, and at best as a mitigated success in selected ethnosocial groups [2]. In fact, whilst the proportion of smokers is falling amongst men in North America and Northern and Western Europe, the trends amongst women do not provide any reason for reassurance. Similarly, the future remains bleak for young people. The present pattern is the result of a phenomenon that can best be described as an epidemic curve spreading from men to women, high to low social class, adult to young [3]. As public health professionals, we cannot accept this development and must be determined to work towards making our planet the home of smoke-free children in the coming century.

SMOKING AMONG YOUNG PEOPLE

In the world population 12% of women and 47% of men are smokers. An increase is still being observed in both sexes but is more marked amongst women. Large differences are seen between industrialised and developing countries. Detailed figures by continents [4] are given in Figure 1. Whereas in the countries of the European Union [5, 6], the gap separating prevalence of smoking among women and men is narrow, almost no difference is seen in several countries and this gap even reversed in Sweden (Figure 2), such is not yet the case in the developing world.

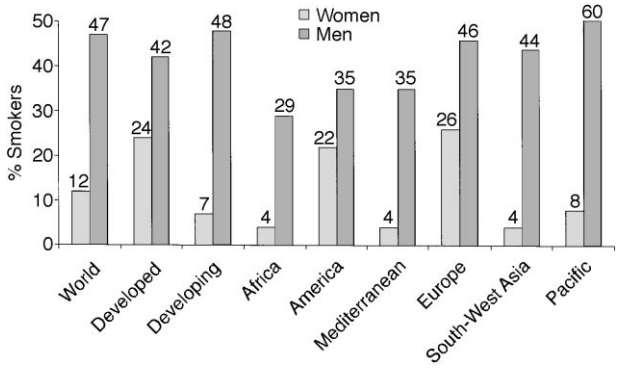

Figure 1. Smoking amongst adults (World). Adapted from [4].

When looking to the future, the most disturbing figures are for late adolescents (Figure 3). With the exception of Greece and to a lesser degree Portugal, the differences between boys and girls are small and the observed prevalence of smokers is predictive of further increases amongst young adults [6]. As an example of impending public health failures, one can cite France (Figure 4), with more than 50% smokers amongst 18–24 year olds [7, 8].

DETERMINANTS OF TOBACCO USE AMONGST YOUNG PEOPLE

Counting the number of smokers and then later on the deaths is not by itself a fruitful exercise. The public health objective is to act to prevent disease and any rational programme should be based on sound knowledge of the determinants.

Numerous articles have been written on the reasons why young people smoke. They all cite the influence of peers, family and society in general. Some studies only look at the influence of peers, others at that of the family. Unfortunately, a comprehensive approach is rarely available. Exceedingly

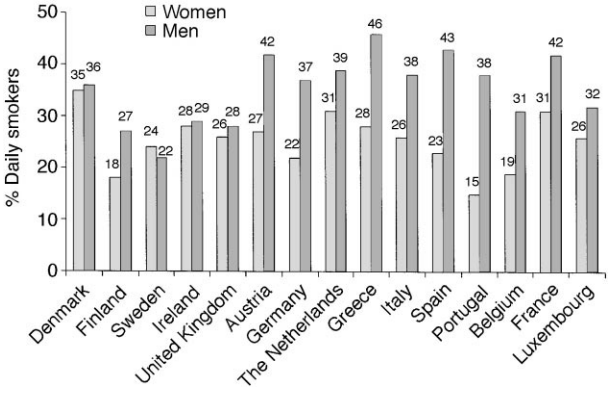

Figure 2. Daily smoking amongst adults (Europe). Adapted from [5, 6].

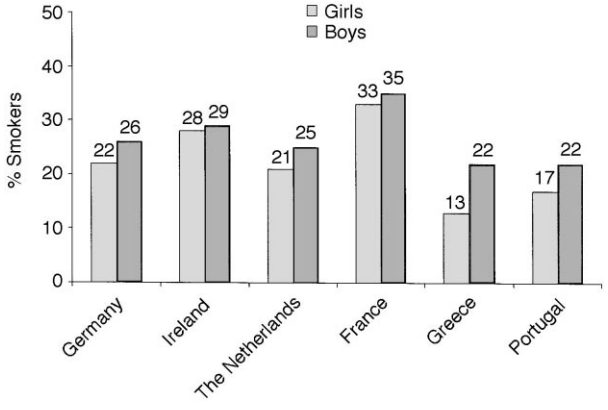

Figure 3. Smoking amongst adolescents (selected European countries). Adapted from [6].

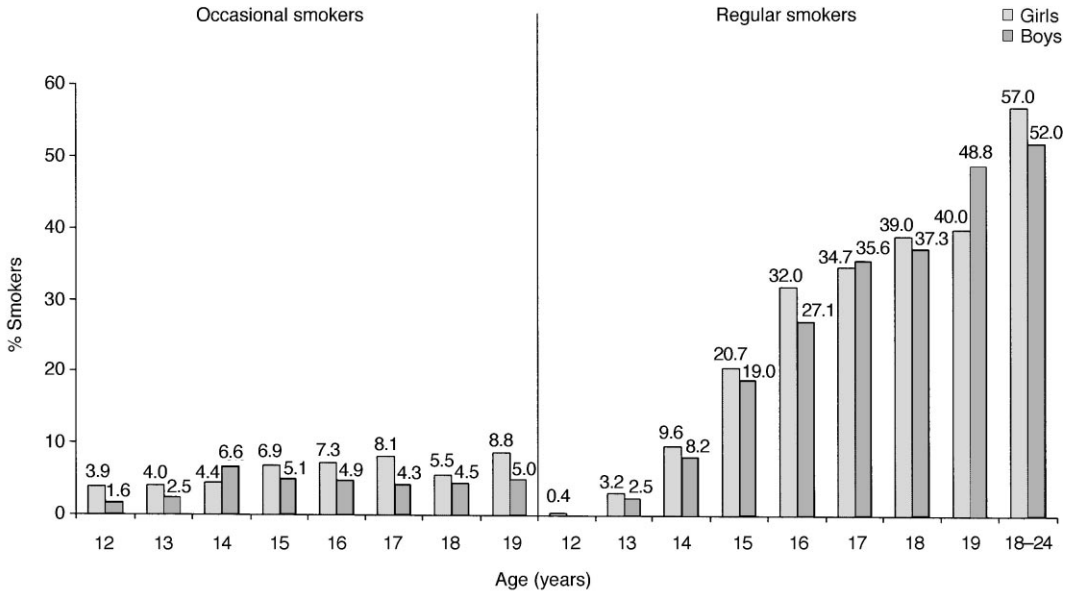

Figure 4. Smoking amongst adolescents and young adults (France). Adapted from [7, 8].

rare are surveys comparing determinants for girls and boys and only recently have techniques been used in the analysis to correct for potential confounding factors.

One of the strongest determinants of tobacco use by a young person is the smoking habit of other people. In writing this paper, we took advantage of a large dataset we assembled on smoking amongst young people from 1985 to 1997. Surveys were done under the scientific leadership of the Unit of Epidemiology for Cancer Prevention (ECP), at the International Agency for Research on Cancer (IARC) in public and private schools in Lyon and Paris by a French volunteer organisation, the 'Student association for the fight against cancer' (ALEC or Association de Lutte Etudiante contre le Cancer). Over the years, more than 20 000 forms have been collected through annual or 6-monthly surveys using anonymous, self-administered questionnaires completed in class by pupils. For the present paper, we have used 13 838 of these, corresponding to investigations conducted at the beginning of the school year, before any health promotion activity. Detailed description of the study and results will be presented elsewhere. Here we will focus our attention on the comparative evaluation of familial and peer smoking influences, examining in particular how girls and boys differ. In order to correct for confounding factors, all analyses used a logistic regression to estimate the influence of each determinant after due adjustment for other variables. Results are expressed as odds ratio (OR) or estimates of relative risk (RR) of being a smoker as a result of parental or peer smoking. Graphics have been used to visually help in assessing the relative importance of each determinant, year by year. Due to slight differences in surveys over time or to small numbers of subjects in some of the cells, results may not be available for some years.

Influence of parental smoking

We looked at parental and sibling influences, separating same sex from different sex effects. The estimated risk if both parents, mother and father, are smokers (Figure 5), is stronger than for having just one parent being a smoker, with a slight predominance for girls than for boys, i.e. a larger influence of parents on daughters than on sons. If we examine separately the effects of maternal and paternal smoking on girls and boys, daughters are more affected by maternal (Figure 6) than by paternal (Figure 7) smoking.

Our results confirm earlier studies indicating a larger influence of family on girls than on boys [9–11]. The greater

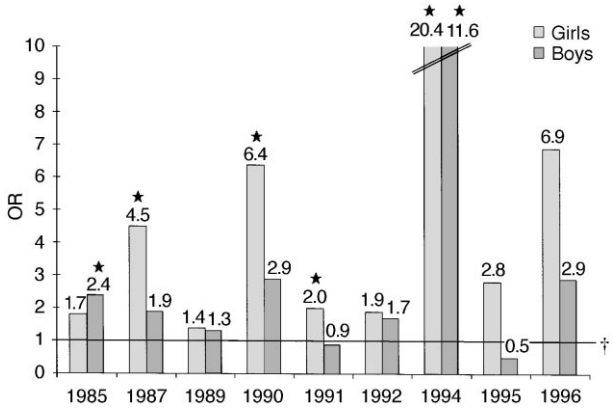

Figure 5. Risk of becoming a smoker as a function of both parents being smokers. *Statistically significant at the 0.05 level. †Reference group of never smokers.

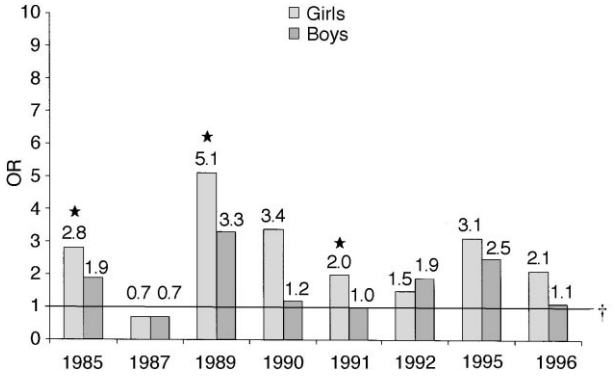

Figure 6. Risk of becoming a smoker as a function of having a mother who smokes. *Statistically significant at the 0.05 level. †Reference group of never smokers.

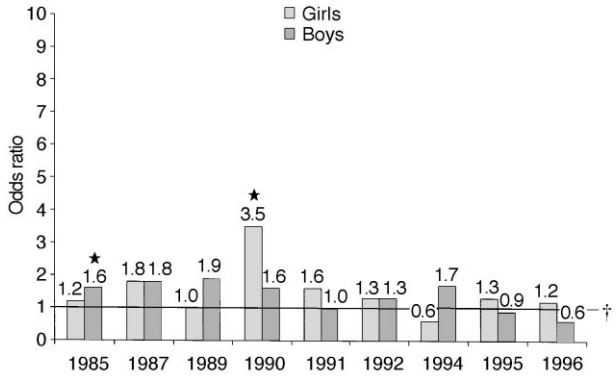

Figure 7. Risk of becoming a smoker as a function of having a father who smokes. *Statistically significant at the 0.05 level. †Reference group of never smokers.

effect of mothers as compared with fathers has been studied less often, although some authors strongly implicate maternal smoking, irrespective of age and sex of the child and largely independent of social background [12]. The role of same sex modelling, i.e. a stronger influence of mothers on daughters and fathers on sons, which we found limited in our study, has been stressed by others [13]. The evaluation, not only of current smoking habits of parents but rather of life-long experience, is also important. Some studies found former smoking of the parents to be strong determinants of children smoking [14, 15]. Yet, some influence is left for the setting of anti-smoking norms in a family. Even with smoking parents, children may have a lower risk of smoking if parents engage in anti-smoking behaviour [16]. In general, clear rules at the familial level help in control of substance abuse [17].

Influence of sibling smoking

Whereas the role of parents is always acknowledged, the influence of siblings has been largely ignored. Yet, by their age and the similarity of shared experiences within the family, siblings can have a strong impact. In our data, the OR associated with having a sibling who is a smoker tends to be greater than the OR associated with parental smoking (Figures 8 and 9). Contrary to what we described for the influence of parents, the predominance of the same sex rather than the opposite sex is very clear. ORs for becoming a regular smoker are almost always consistently higher for smoking by same sex sibling as compared with opposite sex. Therefore, for girls the higher ORs are linked to smoking of the sister and for boys to smoking of the brother. It is difficult to compare our results with others, as to our knowledge this has rarely been studied [18].

Influence of peer smoking

Young people tend to live in groups and bonding with peers is an important social process for adolescents. Several layers of group structure have to be considered.

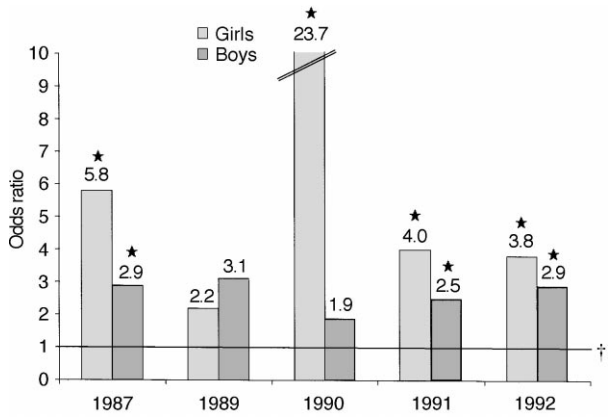

Figure 8. Risk of becoming a smoker as a function of having a sister who smokes. *Statistically significant at the 0.05 level. †Reference group of never smokers.

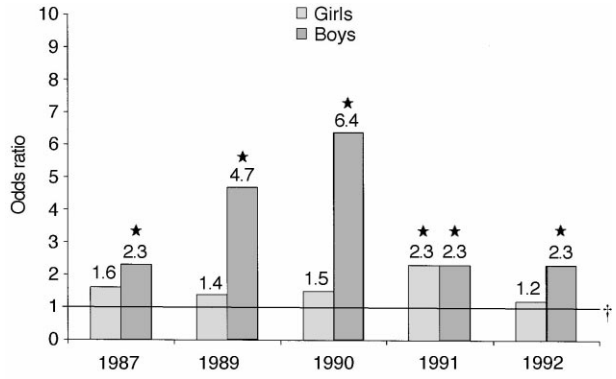

Figure 9. Risk of becoming a smoker as a function of having a brother who smokes. *Statistically significant at the 0.05 level. †Reference group of never smokers.

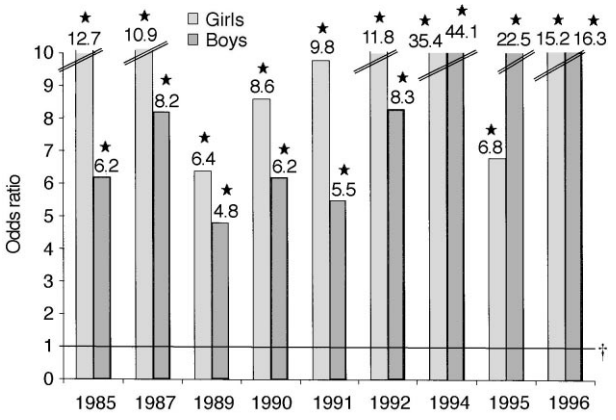

Figure 10. Risk of becoming a smoker as a function of having a best friend who smokes. *Statistically significant at the 0.05 level. †Reference group of never smokers.

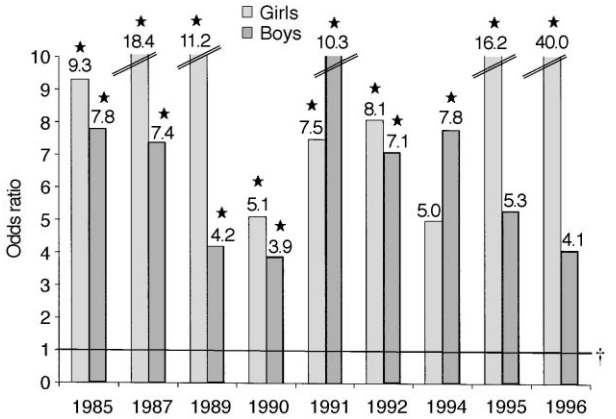

Figure 11. Risk of becoming a smoker as a function of belonging to a group where the majority smoke. *Statistically significant at the 0.05 level. †Reference group of never smokers.

In our data, the strongest determinants are smoking by a best friend (Figure 10), and belonging to a group where the majority smokes (Figure 11). This demonstrates that for adolescents, the impact of peers is much greater than the role model of parents. In fact the older the child gets, the influence of parents is replaced by that of other young people. For the majority of study years, we see a more pronounced effect for girls than for boys (Figures 10 and 11). The influential group has to be self-selected. The impact of having someone who happens to smoke in the classroom is limited (Figure 12). Although the influence is small and similar for girls and boys, the most interesting information here is that although smoking in schools has been, in particular in classrooms during the attendance of pupils, forbidden since 1976 in France, such a practice still occurs. Despite two laws, not to mention numerous decrees and other administrative rules, the compliance still remains poor [19].

Peer influence is one of the most often cited determinants of youth smoking. For a long time it has been believed to be stronger for boys [9], who more likely belong to highly structured groups, be they socially oriented and based, such as fraternities of various kinds, or antisocial such as illegal gangs. However, recent data has found similar or even greater an influence on girls [11]. Some studies indicate that the influence of desired rather than established friends is crucial, smoking being viewed as a way to gain group membership, rather than maintaining old friendship [20]. A similar concept may be envisioned for initiation rather than escalation of smoking [21]. Friends have a greater impact than parents on first trying out smoking, but only a weak effect on augmenting doses [11]. Yet, amongst boys a clear influence of an adolescent's best male friends has been described not only in the transition from non-smoking to smoking but also from experimental to regular smoking [22]. Different behavioural mechanisms may be operative in girls and boys. Whereas direct modelling seems more prevalent for boys, who are likely to adopt the behaviour of the group they want to belong to, girls are influenced by others through indirect effects, such as self esteem and rebellion [23]. Therefore, boys smoke to be just like the others, girls to distinguish themselves from the crowd and to be leaders rather than followers [24]. Social significance associated with smoking is thus different for girls and boys. In both sexes, the congruence between self-image and smoker stereotype is a strong predictor of smoking onset [25, 26]. Yet setting of norms carries less weight for girls [27].

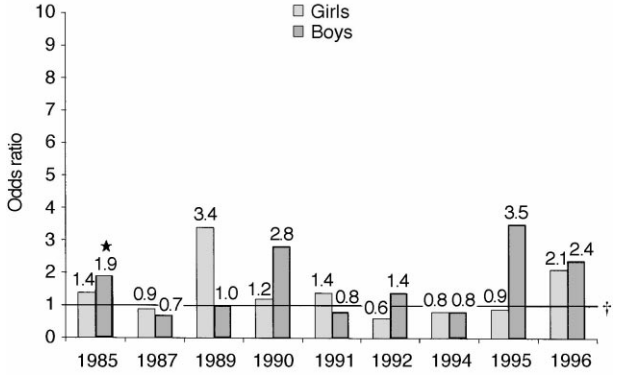

Figure 12. Risk of becoming a smoker as a function of smoking in class. *Statistically significant at the 0.05 level. †Reference group of never smokers.

Competing influences also enter the picture, with sports being a deterrent to smoking amongst boys [28, 29] and weight control and relaxation [30] a motivation for girls.

Influence of society

Children do not live in isolation and are not limited to the familial realm. As citizens of the world and in an era of ever expanding use of media, they are now widely exposed to all kinds of influences, coming not only from their immediate surroundings but also from far away places. The traditional role models in society such as teachers and doctors are still influential. For this reason, it is particularly worrisome that, despite various laws forbidding smoking, teachers admit to smoking in schools, a few even in class [31]. Similarly, doctors and other health professionals are often smokers. Although in some countries such as the U.S.A. or Great Britain, with pioneering epidemiologists demonstrating the link between tobacco and cancer, the percentage of doctors who smoke is now very low, unfortunately this is not yet the case in many other countries, in particular in Europe [32]. Nurses are amongst the professional groups with a particularly high prevalence of smokers in Europe [31], but not in the U.S.A. [33].

A role model more popular than doctors or teachers may be movie stars. In California, after adjustment for known predictors of smoking and demographic variables, adolescents who had never smoked but preferred smoking movie stars were considered more susceptible to becoming smokers. The magnitude of the effect was comparable with that of friends and family. Favourite stars differed for adolescents who had and had not smoked. The top choices of those that had smoked were mostly those actors who smoked on and off screen [34].

The influence of fashion models is also pronounced, in particular on girls. It is, therefore, disquieting to note that more than 40% of European women's magazines allowed editorial photographs of models smoking [35]. In contrast, a countermeasure of using images of youth and beauty can be found in the decision made in Sweden several years ago, to request all candidates for the Miss Sweden title to be non-smokers. Several other countries, including France, have now adopted this attitude.

The use of smoking models or stars may be seen as a form of advertising. With ever more restrictive laws banning direct as well as indirect advertising and sponsoring [36], temptation is great to promote generic, rather than brand-specific positive images of smoking. The association of cigarettes with health, luxury, freedom and love is effective in enhancing the demand for tobacco products. For children, the use of cartoon characters, such as a camel, is the preferred strategy. This explains the targeted advertising of brands popular with young people in magazines with high youth readership [37]. Cigarette advertising increases children's awareness to smoking also at a generic level and encourages them to take up the habit [38]. This has been found in descriptive studies [39] and even in longitudinal cohort approaches [40].

Putting determinants in perspective

All the elements listed above and many others [41, 42], contribute to what has been defined as 'susceptibility' to smoking [43, 44], which can be used to predict from early on which adolescents will take up smoking. As life is not static, the relative importance of the determinants evolves with the age of the children and adolescents. In particular, family,

friends and society are not simultaneously crucial but rather act along the age-scale of life [45–47], leading to the concept of developmental stages in smoking or quitting [48], with a distinct social class effect [49].

The last aspect to be mentioned here is that nicotine dependence may be seen even amongst adolescent smokers [50]. As tobacco is a 'gateway' drug, the increase in smokers recently seen amongst young people, even in countries which have been successful in the fight against smoking (such as the U.S.A.), is particularly worrisome [51]. Early onset of cigarette use has been found as the strongest correlate of other health risk behaviours [52], stressing the need for a comprehensive approach in order to protect adolescents from future disease [53].

PREVENTION STRATEGIES

For prevention to be successful and, therefore, able to promote a generation of healthy and happy adolescents, it needs to be comprehensive, holistic and constant.

Legislation

Laws in the tobacco-control field can accomplish much in setting the stage for health promotion activities. Roemer was instrumental in clearly separating out two avenues for fighting tobacco: (1) act on the supply side, i.e. modify the product and limit its availability and (2) act on the demand side by modifying people's attitudes [54]. For the first domain, possibilities include banning the product, modifying its composition and in particular setting limits for selective constituents, changing the presentation (information provided, health warning, generic packaging), controlling advertising and sales promotion, increasing its price through taxation. For the second realm of action, one can restrict smoking in public places and at the workplace, prevent youths from smoking, and make health education compulsory. All of these approaches have been used in Europe and we see over the years a clear trend towards more restrictive legislation in most countries [55]. Elements of legislation of special importance in targeting young people in particular, include restriction of advertising [56], banning of smoking in schools and other places where children and adolescents congregate [57] and, finally, educating children [58].

An element that has been consistently found to be effective has been to increase the price of tobacco, thereby reducing tobacco consumption. Adolescents are particularly sensitive, with a greater response than adults. This is especially pronounced for boys [59]. Another way of restricting tobacco consumption is to set limits from a legal point of view, prohibiting sales to minors and banning vending machines. The effects of such limits and bans have mostly been evaluated in the U.S.A. [60–66] and in Australia [67]. Although only mildly enforced, banning has some impact and contributes to the societal outlook on smoking.

Health promotion

Health professionals can be educators, promoting a healthy lifestyle and behaviour. Evaluation of smoking can be done during visits to healthcare providers [68] and paediatricians are often willing to engage in anti-smoking advice and provide support for quitting [69]. Clinician advice against tobacco use has been associated with a reduced uptake of smoking, even in groups where smoking was considered socially desirable [70]. Results are enhanced if social class and sex are taken into account. Girls are usually less responsive than boys [71] but this is partly explained by the fact that most programmes, at least in the past, were essentially directed towards boys.

The major and most natural places for health education are schools. Several studies compared teacher-led and peer-led programmes, sometimes with expert interventions. More favourable effects were seen with school members as actors, be they teachers or pupils, than for outsiders such as health professionals [72]. Teacher-led approaches were initially found to be more effective on girls than on boys [72], with more lasting effects on girls [73]. This was not confirmed in Norway [74]. In order to be effective, programmes must be intensive, of long duration and well integrated into the school curriculum. One of the most remarkable and most successful examples is the 'Know Your Body' programme, a creation of the late Ernst Wynder, founder of the American Health Foundation [75]. Unless interventions are strengthened with the inclusion of booster sessions, the positive effects of most programmes will wear off [76].

Similarly discouraging results have been obtained with media campaigns, using television or radio, even with peer involvement [77]. Combining media and school interventions may achieve better results [78].

REFLECTING UPON THE PAST AND MOVING TOWARDS THE FUTURE

Despite the number and variety of approaches to prevent young people from smoking, successes have been limited and failure is rampant. Although no one may claim the miracle solution, good sense and educated analysis of the vast literature available points toward recognition of the problems and proposals for improvement.

Legislation has long been insufficient and under-implemented. Having good laws passed is not enough; their enforcement is crucial and penalties have to be really dissuasive.

In the field of health promotion, programmes have to be comprehensive, integrated into the overall education of each child, yet diverse and flexible. Care has to be taken to respect sex and age differences, to adapt to the social and cultural background of the subjects, to constantly evolve as the child ages and societal outlook on tobacco changes. Numerous guidelines exist, based on national assessments [79], and giving practical advice to local authorities [80] or internationally, be they general [81] or specific is essential [82]. Two aspects are crucial—integrating programmes within society [83] and starting these programmes in childhood to have impact in adolescence later [84].

The fact that tobacco is part of society leads to a simple conclusion: resolution of the tobacco problem can be obtained through integration of policies, touching upon politics in the original sense of the word of administration of modern life in society [85, 86]. If we want to succeed in having a healthy younger generation, we need to set aside the means to do it. At the dawn of the twenty-first century, it is finally time to act!

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