Reducing Lung Cancer and Other Tobacco-Related Cancers in Europe: Smoking Cessation Is the Key

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Disclosures of potential conflicts of interest may be found at the end of this article.

INTRODUCTION

Tobacco is the biggest preventable cause of cancer in the world [1]. Estimates suggest that approximately one-third of all cancers are caused by tobacco use. Although 80%–90% of all lung cancers are attributable to tobacco, it also has a causative role in malignancies of the mouth, larynx, pharynx, nose and sinuses, esophagus, stomach, liver, pancreas, kidney, bladder, cervix, and bowel as well as one type of ovarian cancer and some types of leukemia. The situation in Europe is particularly worrying. More than 650,000 premature deaths are caused by smoking every year [2]. Only 15% of the world's population lives in Europe, but nearly one-third of the burden of tobacco-related diseases occurs in Europe. Coupled with the extremely negative effect on the health of the European citizen, there is also an economic penalty, with tobacco-related health effects estimated to have cost the European economy between €98–130 billion in the year 2000 [3].

WHY IS TOBACCO A PROBLEM?

Tobacco is a widely and legally available product which, through the drug nicotine, is highly addictive and is promoted by a powerful and highly profitable industry. It has several marketing advantages over other addictive drugs. Other addictive drugs are mostly illegal, their method of administration is often by injection, they are socially disruptive, and they have very low social acceptability. In contrast, tobacco use has been the norm in the past and still has social acceptability in certain societies. Thousands of harmful chemicals are present in tobacco and particularly in tobacco smoke, which has documented serious adverse health effects. There are 70 known carcinogens in cigarette smoke including nitrosamines, polycyclic aromatic hydrocarbons, benzene, cadmium, toluene, and vinyl chloride [4].

CAN ANYTHING BE DONE TO CURTAIL TOBACCO USE IN EUROPE?

The use of tobacco is falling in the European Union (EU), although the prevalence—at approximately 29% of the adult population—remains stubbornly high and is increasing among females in some European countries [4, 5]. The World Health Organization (WHO) has validated several strategies which are effective in curtailing the use of tobacco [6]. These approaches

include using increased price, through taxation, as a tool to reduce tobacco use. The use of smoke-free legislation to prevent exposure to second-hand smoke (SHS) in the workplace is also important in preventing cancer because SHS is also a known contributor to cancer development [7]. The banning of advertising, sponsorship, and promotion of tobacco is an effective and a widespread intervention to help reduce tobacco use; however, the use of strong antismoking advertising has also been shown to be effective. WHO recommends the monitoring of smoking and the provision of cessation programs to help smokers stop smoking. These interventions are incorporated into the WHO MPOWER strategy [6], and evidence suggests that this package of effective measures works best when all of the strategies are used in tandem.

TAXATION AS A TOOL TO PREVENT CANCER

Of the measures outlined, price is probably the most powerful in reducing tobacco use. The relationship between price and reduction of demand for smoking is described by the price elasticity. There is a 3%–4% fall in consumption with a 10% increase in price, and this figure appears to be remarkably robust [8]. Recently, this relationship has been examined for 11 EU countries in the Pricing Policy and Control of Tobacco (PPACTE 2012) FP7 funded project [9]. The relationship between a rise in price and a fall in tobacco consumption is clear; however, a number of important aspects of this relationship must be considered. Lower socioeconomic groups and younger people are most sensitive to price increase as a deterrent, whereas in higher socioeconomic groups, price is not necessarily a determining factor. Income increases are inversely related to elasticity of demand [10].

THE TOBACCO INDUSTRY AND TAXATION

The use of price as an instrument to reduce tobacco use is usually opposed by the tobacco industry and its allies. The industry and its representatives usually try to persuade finance ministers that a price increase will lead to a loss of revenue through an increase in smuggling, although the evidence from many studies, including the Pricing Policy and Control of Tobacco project [8], is that this is not the case. In every country

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and region where it has been studied, a rise in tobacco price leads to an increase in revenue and a reduction in cigarette consumption. Although there is a theoretical limit where a price rise ceases to be effective in reducing tobacco consumption, this limit has not been reached to date. In addition, price is not the only or, indeed, the main cause of increases in smuggling. Smuggling is much more dependent on other factors such as the existence of established distribution networks, high levels of corruption, criminal involvement, low penalties for smuggling, and low probability of detection, with low implementation of controls and, in the EU, the proximity to land borders where a high volume of cheap cigarettes are available, such as Russia, Belarus, Ukraine, and Moldova [11].

It is clear that persuading governments to use price rises for health reasons is not an easy task; however, the need to dispel the myths promoted by the tobacco industry is paramount and represents an important focus for all health advocacy and cancer control organizations. Taxation is an effective, highly cost-effective and very powerful tool available to governments if they want to prevent cancer and the many other diseases which are caused by tobacco.

THE IMPORTANCE OF SMOKE-FREE LEGISLATION

Because Ireland introduced its comprehensive national smoke-free legislation in 2004, many European countries have followed Ireland's lead, but not all of those have introduced laws as comprehensive as Ireland's. Nevertheless, all 27 EU member state countries have initiated some form of smoke-free strategy. To date, 14 EU member states have enacted laws which ban smoking in all indoor workplaces including bars, restaurants, and clubs; however, a number of countries with significant populations such as Germany and Poland have only limited smoke-free laws. The tobacco industry and its allies have also been active in trying to stop or slow introduction of smoke-free legislation. Predictions of significant negative effects on trade and tourism are the main arguments of the tobacco lobby, despite the fact that scientific research refutes this hypothesis [12, 13]. The support of the Framework Convention on Tobacco Control (FCTC), a binding treaty which demands action on smoke-free legislation and to which all EU countries have signed, and strong EU Council recommendations on smoke-free environments [14], underpin the implementation of strong bans on smoking in the workplace. The WHO treaty and EU Council recommendations are robust strategies which can help ensure that the citizens of Europe will be free from SHS in the workplace. It is encouraging that Russia, where smoking prevalence is very high (more than 50%), introduced its smoke-free measure on June 1, 2013, banning smoking in airports, train stations, stadiums, schools, playgrounds, hospitals, government institutions, beaches, and places of employment. Tougher smoking fines were signed into law by President Vladimir Putin on October 21, 2013. Unfortunately, throughout Europe, many people are still exposed to SHS in confined places such as cars and homes. This is particularly worrying when we realize that children are often being subjected to these known carcinogens by loving parents and guardians.

The importance of smoke-free policies for cancer prevention is high. SHS is a definite cause of cancer and is defined as Class 1 carcinogen by the International Agency for Research on Cancer. The number of cancers caused by SHS can be

calculated [3], but smoke-free policies have other cancer prevention benefits. They discourage young people from starting to smoke, encourage smokers to quit, and help former smokers stay off smoking [15]. Smoke-free policies can achieve their positive effect by educating about the health benefits, limiting opportunities to smoke, and promoting an attitude of denormalization of smoking. Smoking has often been regarded as a normal social activity despite the fact that it is addictive, is a cause of great inequality, and contributes significantly to disease, disability, and death.

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RESTRICTION OF MINORS' ACCESS TO TOBACCO

Considering the negative health effects directly attributable to tobacco, it is often argued that tobacco should be banned. This product kills half of the customers who use it as instructed—if tobacco were a new product, it clearly would not be legally sold, given its significant contribution to morbidity and mortality—yet banning outright the sale of tobacco is not considered feasible in most countries at present. The situation in which approximately one-third of the population uses an addictive product cannot be solved by an immediate ban. Certain countries such as Finland foresee the possibility of banning its use by 2040, but no country in Europe is ready to ban tobacco outright today. There are much more promising data on the feasibility and usefulness of banning the sale of tobacco to minors. Introducing restrictions which are not enforced does not influence tobacco usage, but there is clear evidence that properly applied restrictions do reduce teenage smoking [16], which is particularly relevant, given that 85% of smokers begin their addiction in their teens [17].

ADVERTISING, SPONSORSHIP, AND PROMOTION

The banning of advertising, sponsorship, and promotion is important and widespread in the EU, backed by a European Commission Directive on advertising; however, the ban is not universally adhered to and is not applicable outside the EU. The abuse of developing economies with tobacco advertising is still widespread. In the EU, the battleground has shifted to the packaging. The use of health warnings and, more recently, graphic images of diseases caused by tobacco have become common on cigarette packages in many countries. Cancer images are among the most often used and usually show advanced disease. These images are thought to be effective in changing attitudes to smoking [18]; however, the recent amendment to the EU Tobacco Products Directive did not go far enough, limiting the health warnings to 65% coverage of a pack of cigarettes rather than the 75% originally proposed.

Australia has led the world in introducing what is called "plain packaging," in which the iconic logos of the tobacco

Figure 1. Estimated cumulative tobacco deaths 1950–2050 with different intervention strategies. Adapted with permission from [8].

industry are replaced by the simple description of the maker and health warnings and images are used to discourage tobacco use. It is hoped that plain packaging will be used increasingly by EU member states on the basis of national regulation, although to date it has not been mandated in the amendments to the EU directive. It is also clear that media campaigns (using both television and online and social media) to discourage smoking are effective, but they must be sustained to ensure maximum benefit. Media campaigns have cost implications but are also cost effective.

TREATMENT OF TOBACCO DEPENDENCE

Every effort should be made to prevent children from smoking, and this will have a major long-term effect on cancer prevalence; however, it has no discernible effect on cancer rates in the short term. It is imperative that an effective antitobacco strategy must encourage current smokers to stop (Fig. 1). The interventions outlined can help but, for current smokers, often result in a reduction in consumption rather than cessation. Complete cessation rates, unaided, approach only 2%–3% per quit attempt. Nevertheless, many former smokers have quit unaided, and in a disease as prevalent as tobacco dependence, a 2% reduction is significant. Every effort should be made to encourage smokers to stop. In this regard, health care professionals and doctors in particular have a duty of care to advise all their patients on smoking cessation. It has been shown repeatedly that such advice is effective in getting smokers to stop.

In addition to advice, other more effective treatment approaches have now been validated. Treatments consist of a combination of medication and counseling. Both are effective, but better results are achieved by a combination of these interventions. Drugs of proven efficacy include nicotine replacement therapy; bupropion (an antidepressant which can help patients quit and that limits weight gain in smokers who quit); varenicline (which acts at the site of the brain where nicotine is active to ease withdrawal symptoms and block the effects of nicotine in people who resume smoking); and, more recently, cytisine-containing drugs. Cytisine has been used for many years in eastern Europe and has been shown in randomized control trials to be very effective and cheaper than other approaches, but it may be more toxic than varenicline

[19]; however, these drugs are offered only to a minority of smokers by their doctors. Counseling with or without motivational interviewing has also been validated. Success rates with these treatments are on the order of 20%–30%. Some clinics report much higher success rates, but with a chronic relapsing disease such as tobacco dependence, this is a very acceptable success rate.

TREATMENT RATES

In countries where there are good, well-established treatment services, such as the U.K. and Denmark, only a small percentage of patients receive treatment, probably less than 5%. There can be no other disease with 50% mortality and for which effective and cost-effective treatment exists and yet so few individuals are treated. The reasons for this are not clear. They include poor promotion of availability of services; lack of demand from “patients”; lack of knowledge about the existence of effective treatment, even among the medical profession; and unwillingness to provide smoking cessation services. The medicalization of smoking cessation is not fully agreed, with some powerful public health practitioners saying that reliance on other tobacco control measures is more cost effective [20]. The comparison, for instance, between smoke-free legislation and pharmaceutical treatment would suggest that smoke-free legislation is likely to be more cost effective, but that may not be the appropriate comparator. If treatment of tobacco dependence is compared with treatment of hypertension or hypercholesterolemia on the basis of quality of life years, then the figures overwhelmingly favor the implementation of smoking cessation policies [21].

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When general practitioners are asked, as was done in the PESCE project [22], why they do not get more involved in treatment of tobacco dependence, they give a number of reasons including lack of time, lack of training, loss of patients to other doctors not offering treatment, lack of confidence in the efficacy of treatments, and lack of monetary reward for such activities in most European countries. Oncologists, respiratory physicians, and cardiologists, whose specialties are perhaps most affected by smoking-related diseases, agree this work is very important, but it is not agreed that it is their responsibility to treat this comorbidity in so many of their patients. This is perhaps more remarkable when it is realized that not only are many of the diseases caused by smoking but also that effective treatment of secondary diseases is much less effective if the patient is still a smoker.

WHAT NEEDS TO BE DONE?

The FCTC offers a blueprint to help control tobacco, but even if all the recommendations in the treaty were enforced immediately, it would not prevent all tobacco-related cancers because it does not foresee the end of tobacco. New and more effective interventions are needed. These will be discovered only if the medical and scientific communities apply themselves to finding a real “cure” for this problem and if they are supported by society and resourced appropriately. Research in this field is complicated by the need for a truly multidisciplinary approach, with the resources to recruit and retain high-quality scientists. Even with such support, a rapid solution does not seem likely. The main reason for the slow pace is largely in the nature of the disease, which almost uniquely is promoted by a powerful, very well-resourced industry that promotes an addictive product. The political aspect of the tobacco industry has always been complex. This is addressed in the FCTC, where Article 5.3 forbids inappropriate contact between governments and the tobacco industry; specifically, it states that the industry should have no input into the public health aspect of tobacco. Getting compliance with Article 5.3 has proven difficult, even in the EU.

In this time of economic austerity, what is the optimal approach to tobacco control in Europe? This is probably a very good time for brave tobacco control interventions. Tobacco control is low cost and highly cost effective. Many more expensive innovations in health care are on hold. There is no need or justification for a reduction in tobacco control efforts;

however, taking action requires a plan and prioritization of interventions. European countries are not at the same stage of development with regard to tobacco control. Countries need to establish their own priorities, helped by strong EU directives in compliance with the FCTC. Experience from countries with advanced tobacco control has allowed the calculation of estimates of relative efficacy of various interventions, and, through SimSmoke, dynamic modeling allows prediction of which interventions are most likely to give most benefit in a particular country at its present state of tobacco control. These estimates need painstaking data collection and have limitations, but estimates for 15 European countries have already been published and are freely available [9].

WHAT SHOULD ONCOLOGISTS DO?

Ideally, oncologists should realize that tobacco control is at least partly their responsibility. Acknowledging this fact, an understanding of tobacco control and, in particular, treatment of tobacco dependence could be a part of their training. This could lead to the development of a strategy in which no smoker with cancer would be without intervention for nicotine addiction. Prevention of cancer through smoking cessation would get the prioritization it deserves in cancer research and practice. Oncologists could support and participate in essential multidisciplinary tobacco control research and bring to bear a powerful voice, together with patients, advocates, and antismoking organizations, in the promotion and implementation of robust tobacco cessation policies in Europe.

Although it is critical to pursue stringent antitobacco policies, it is also important to develop strategies and support services that will help the active smoker to quit. Specialist services that provide both behavioral support and effective medical interventions should be encouraged and appropriately resourced. Both intensive one-to-one therapy and group therapy approaches should be considered. Trained smoking cessation advisors can provide appropriate guidance and motivational support. Developing a personalized quit plan that is tailored to the individual and encompasses all aspects of modern smoking cessation practices is an effective and practical strategy to help smokers to a life without cigarettes.

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