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Women and the Tobacco Epidemic

Challenges for the 21st Century

The World Health Organization
in collaboration with the
Institute for Global Tobacco Control
Johns Hopkins School of Public Health

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Tobacco Epidemic

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Edited by
Jonathan M. Samet
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The World Health Organization
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A Message from Dr Gro Harlem Brundtland
Director-General, WHO

This book supports a powerful and important concept—that the rights of women and children to health are basic human prerogatives. Four million unnecessary deaths per year, 11,000 every day—it is rare, if not impossible to find examples in history that match tobacco's programmed trail of death and destruction. If current growth rates continue, by 2020, tobacco use will be responsible for about 10% of the global burden of disease. By then, we can expect over four million additional deaths caused by tobacco. Most alarming, the rates of smoking are increasing among youth and young women in several regions of the world. In the areas of the world where tobacco use is still relatively low among women and girls, a golden opportunity exists for preventing increased uptake and future premature deaths.

Passive smoke is also an important women's issue. In the Asian region where, on average, more than 60% of men are smokers, this means millions of women and children suffer from passive smoking. New evidence shows that parental smoking contributes to higher rates of sudden infant death syndrome as well as asthma, bronchitis, colds and pneumonia in children. We must do everything we can to protect women and children's rights to a safe and healthy home environment.

Preventing a tobacco epidemic among women and youth is for a large part a matter of sound economic policy. Studies in Thailand, China, Switzerland and the United Kingdom show that the economic "benefits" of tobacco are illusory. According to the World Bank, the use of tobacco results in a net loss to countries' economies of billions of dollars a year—with most of those losses occurring in developing countries.

Every day, WHO is exploring new ideas and gaining insights into how to get tobacco use under control, how to help smokers quit, and how to treat the sick. Getting the science right is the foundation on which health policies must stand. This includes extending our knowledge base beyond the medical sciences. In this book we have drawn upon the expertise of anthropologists, psychiatrists, economists and those undertaking gender studies, as well as researchers in the health sciences. WHO welcomes input from lawyers, parliamentarians and from women leaders about the community campaigns and legal instruments that defend women and children's rights—including the **Convention to Eliminate All Forms of Discrimination Against Women** and the **Convention on the Rights of the Child**. These experiences will be valuable for the ongoing process of negotiations of the **Framework Convention on Tobacco Control**.

It is our responsibility as the world's premier health agency to place at the disposal of our Member States the best of science and economics, because both of them are key variables in health. I am confident we will turn the trends around. I am confident because truth and science are on our side. If we do not act decisively today, a hundred years from now our grandchildren and their children will look back and seriously question how people claiming to be committed to public health and social justice allowed the tobacco epidemic to unfold unchecked. Now is the time to act.

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Preface

The Director General of the World Health Organization, Dr Gro Harlem Brundtland, has long recognized the importance of tobacco as a women's issue. As Director-Elect, she wrote an editorial in the June 1998 newsletter of the International Network of Women Against Tobacco (INWAT):

> *There can be no complacency about the current lower level of tobacco use among women in the world; it does not reflect health awareness, but rather social traditions and women's low economic resources. Girls are the most vulnerable, as smoking starts in youth. Girls and women are being targeted all over the world by expensive and seductive tobacco advertising images of freedom, emancipation, slimness, glamour and wealth. Tobacco shouldn't be advertised, subsidized or glamorized.*
>
> *Tobacco causes similar health problems in women as it does in men—lung cancer, heart disease, chronic bronchitis and emphysema, infertility, and a wide range of other diseases. In addition, women suffer complications in pregnancy which can affect their own or their fetus's health, such as miscarriage and low birth weight. Women are exposed to passive smoking if they live or work with a smoker, and if parents smoke, the children suffer.*
>
> *If there are no dramatic changes in prevention and cessation rates and no new interventions, the prevalence of smoking among women in developed and developing countries could rise to 20 percent by 2025. Lung cancer, which is currently the fifth cause of cancer deaths among women in the world, could increase in the future to become number one as it already is for men. In addition to health consequences, tobacco also has negative economic effect upon women's lives.*

While the epidemic of tobacco use among men is in slow decline, the epidemic among women will not reach its peak until well into the 21st century. In general, 8 percent of women in developing counties and about 15 percent in developed countries currently smoke cigarettes; in addition, tobacco is chewed by women in India and several other countries. Unless there are new, innovative, robust and sustained initiatives, by 2025 it is predicted that both figures will be around 20 percent with the current 187 million women smokers in the world today rising to 532 million. This huge increase in the number of women smokers around the world will have enormous consequences on health, income, the fetus and the family. WHO has given high priority to strengthening global action on women and tobacco issues, for example:

- WHO has secured funding for a major initiative on women and tobacco in the 14-country Southern African Development Commission. It is ensuring that the WHO Framework Convention on Tobacco Control process and content will explicitly reflect issues related to women and WHO headquarters has a full-time person working on issues related to women and tobacco.

- In the Western Pacific Region, all three 5-year Action Plans on Tobacco or Health since 1990 have emphasized the importance of preventing a rise in tobacco use among women as a high priority.

Non-governmental organization concern has also been strong. The International Network of Women Against Tobacco (INWAT) was founded in 1990 to address the issues around tobacco and women, and now has members in more than 60 countries. The International Union Against Cancer (UICC) organized the First International Conference on Women and Smoking in Northern Ireland in 1992, but individual countries which have taken national action specifically on women and tobacco are almost all in the rich world.

Against this background, these papers were commissioned by WHO in preparation for the international meeting on Women and Tobacco in Kobe, Japan in November 1999. This meeting was of critical importance as it drew in, for the first time, women's organizations beyond the traditional tobacco control groups

and culminated in The Kobe Declaration on Women and Tobacco. The conference was timely, for Asia, Japan and for the world as a whole. Asia holds the future for the global tobacco business: one third of all cigarettes in the world are smoked today in one country alone—China. Asia is particularly targeted by the tobacco industry because of population size and increasing affluence.

Higher rates of Japanese women smoke than in most of the rest of Asia. The Ministry of Health is committed to addressing the challenge, but Japan still lacks strong legislative measures to combat tobacco, and tobacco promotion, including advertising targeting women, is widespread. Cigarette packs carry only the mildest health warning, and while smoke-free areas are increasing, they are still infrequent. Cigarettes in Japan are cheap in comparison with other developed countries. In addition, Japan Tobacco is becoming a major player on the global tobacco industry scene, having bought the international arm of R.J. Reynolds company, exporting to Asia and beyond and becoming increasingly politically active. Tobacco use in the rich countries must also not be forgotten. The net result is that more girls and women are using tobacco around the world.

This publication is opportune, as the number of women using tobacco is poised to increase, especially in developing countries, for the following reasons:

- The female population in developing countries will rise from the present 2.5 to 3.5 billion by 2025, so even if the prevalence remains low, the absolute numbers of women smokers will increase;
- Girls'and women's spending power is increasing so that cigarettes are becoming more affordable;
- The social and cultural constraints which previously prevented many women smoking, such as in China and in Muslim countries, are weakening in some places;
- Women-specific health education and quitting programmes are rare, especially in developing countries;
- Large numbers of women are now passive smokers, particularly at home, and increasing smoking by women will enlarge the number of exposed children;
- The tobacco companies are targeting women with well-funded, alluring marketing campaigns. They cleverly link the emancipation of women with smoking, using slogans similar to what was used in western countries decades ago, such as "You've come a long way, baby;"
- Governments in developing countries may be less aware of the harmful effects of tobacco use and are preoccupied with other health issues; they mostly see tobacco as a problem confined to men.

Women's organizations and women's magazines are now recognizing that tobacco use is a feminist issue and that they need to take an appropriate role. In her editorial for INWAT, Dr Brundtland concluded:

> *We need a broad alliance against tobacco, calling on a wide range of partners such as women's organizations to halt the relentless increase in global tobacco consumption among women. There is a special need for gender-sensitive health education and quitting programmes. There is also a need to involve more women in senior decision-making positions in the tobacco control movement, on editorial boards of medical journals which include tobacco issues, on WHO expert panels, and in non-governmental organizations that deal with tobacco issues.*

In keeping with this urgent call, this publication outlines the problem of tobacco use among women and offers solutions—solutions that must be heeded to prevent and reduce an epidemic of the gravest order.

Dr Judith Mackay
Chair: WHO Policy, Strategy Advisory Committee for the Tobacco Free Initiative

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Introduction

In 1999, at the first WHO International Conference on Women and Tobacco in Kobe, Japan, 500 health experts, women leaders, government leaders and anti-tobacco activists adopted a Kobe Declaration by consensus. The landmark document demands that the WHO Framework Convention on Tobacco Control (FCTC) "include gender-specific concerns and perspectives in each and every aspect" and states that "gender equality in society must be an integral part of tobacco control strategies and women's leadership is essential to success (1)." The reason for their urgent call to action was the rising epidemic of tobacco use among women and youth.

Women leaders at that gathering showed strong support for the FCTC because they recognized tobacco as a global threat to women's health. As Dr Gro Harlem Brundtland, Director-General of WHO, stated in her opening address,

> *The world has rules for trade and disarmament, for the environment and human rights. It is about time we had a global set of binding rules devoted entirely to health. It seems only right that this public health endeavor be devoted to tobacco, which, in the first half of the next century, will kill more people than malaria, maternal and major childhood conditions and tuberculosis combined. The Framework Convention on Tobacco Control is both a process and a product. We will identify all those areas of governance that we will need to activate if the world is to find a robust solution to the danger of tobacco. It is our responsibility as the world's premier health agency to place at the disposal of our Member States the best of science and economics, because both of them are key variables in health. The science is unequivocal: tobacco kills (1).*

The purpose of this book is to contribute to the global effort to confront and control the tobacco epidemic. The scholars who prepared these papers worked in interdisciplinary teams to review the most current data and provide overviews concerning the global situation. The topics range from prevalence of tobacco use among women and girls to addiction and treatment. The papers also deal with the critical issues of national economic policy, international treaties and strategies for mobilization at regional and international levels. Concerns of tobacco control policymakers, public health advocates, economic planners, as well as women leaders, are addressed.

What are some of the salient findings? WHO estimates that there are currently 4 million deaths a year from tobacco, a figure expected to rise to 8.4 million by 2020. By that date, 70 percent of those deaths will occur in developing countries. Global estimates indicate that about 12 percent of women smoke compared to about 48 percent of men (2). However, the epidemic of tobacco use is rising rapidly among women, particularly young women. The most recent national survey conducted by the Japan Ministry of Health indicated that, in 1999, the female smoking rate (13.4 percent) was about one-fourth of that of males (52.8 percent) but that it was as high as 4.3 percent among girls aged 15 to 19 years (3).

In several industrialized countries including Denmark, Germany and the United States, more young women aged 14 to 19 years than young men now smoke (4). In this book, the article by Mira Aghi, Samira Asma, Chng Chee Yeong and Rose Vaithinathan, entitled *Initiation and Maintenance of Tobacco Use*, as well as Janet Brigham's paper, *The Addiction Model*, address the issue of why young women and girls use tobacco. A wide variety of products such as cheroots and chuttah as well as modern cigarettes are used. The authors agree that reasons for tobacco uptake may include cultural, psycho-social and socioeconomic factors, such as body image, peer pressure and addiction. For example, in the Asian and Pacific countries where smoking is a symbol of women's liberation and freedom from traditional gender roles, young women are becoming increasingly addicted to tobacco. Moreover, there is a popular belief that smoking keeps them slim. Addiction sets in quickly as a cigarette is a carefully designed nicotine delivery system that provides an amount of nicotine sufficient to establish and maintain dependence on tobacco.

Tobacco use by children and teenagers also needs to be addressed. According to the 1999 Japan national survey, among the 33 million smokers in Japan, around l million are youth under 20 years of age. Studies in developed countries show that most people begin using tobacco before the age of 18 years and recent trends show an earlier age of initiation and rising smoking prevalence rates among children and adolescents (5). A study of students aged 13 to 15 years across 12 countries indicated that in the Ukraine, Russian Federation and Poland, around 30 percent were current smokers. Although rates were lower at around 20 percent in Costa Rica, Jordan and South Africa, the rising trends were cause for concern (5).

The tobacco industry's aggressive marketing and promotion tactics that target women and reach children are also causal factors. Nancy Kaufman and Mimi Nichter, in *The Marketing of Tobacco to Women: Global Perspectives*, leave little doubt that the tobacco industry considers female consumers to be a lucrative market. In many countries recently affected by free trade agreements, there has been a flood of savvy marketing strategies by the tobacco industry targeted at women. Large companies sponsor events such as women's tennis games and disco dances to create a public image as promoters of health and relaxation. "Female brands," "light" cigarettes, low prices, easy availability and free samples help make these marketing strategies successful among young women. A rise in tobacco use by young schoolgirls is a danger signal because those who start as children find it hardest to quit. If the current trend continues, within 15 to 30 years, there will be a major explosion in the health costs of smoking among the young women who are now starting to smoke in increasing numbers.

Richard Windsor, in his paper on *Smoking, Cessation and Pregnancy*, emphasizes that adolescent girls and women who smoke when pregnant are in double jeopardy. Maternal smoking is associated with a higher risk of miscarriages. Chewing tobacco or smoking during pregnancy may also increase the possibilities of low birth weight babies. As young women reach middle age, one in four of them could be killed by tobacco. Over the next 30 years, tobacco-related deaths among women will more than double. The sad fact is that if women smoke like men, they will die like men.

Women who use tobacco face virtually the same risks as men and in some cases even more. Virginia Ernster provides an overview of why women should be concerned in *Impact of Tobacco Use on Women's Health.* According to her analysis of the data, in the US, lung cancer has surpassed breast cancer to become the leading cause of cancer mortality among women. Worldwide, lung cancer currently accounts for over 10 percent of cancer deaths in women. Furthermore, women may be more susceptible to the effects of tobacco carcinogens than males. Some studies have shown that when smoking the same number of cigarettes, women have higher rates of lung cancer.

She further concludes that smoking is one of the major causes of coronary heart disease (CHD) among women, accounting for perhaps the majority of cases in women under age 50. Risk increases with the number of cigarettes smoked and duration of smoking. The risk of CHD is even higher among women smokers who use oral contraceptives. Among postmenopausal women, current smokers have lower bone density than non-smokers and they have an increased risk of hip fracture. The good news is that except for smoking during pregnancy, many risks are quickly reduced when smokers quit. Saundra Hunter's paper on *Quitting* argues that quitting programmes for women throughout the life cycle need to be integrated into quality and affordable health services.

Another reason to sound the alarm is because the majority of the world's women and children are exposed to smoke and its health hazards even if they do not use tobacco themselves. Jonathan Samet and Gonghuan Yang, in their article *Passive Smoking, Women and Children*, argue that smoke is a serious source of indoor air pollution and that many women and children are not protected at home. There is now sound scientific evidence that passive smoke or environmental tobacco smoke (ETS) causes illnesses and deaths among women and children. Women whose male partners smoke have increased rates of lung cancer and increased risk for coronary heart disease. When both fathers and mothers smoke there is a greater chance for infant death syndrome and higher rates of asthma, bronchitis, colds and pneumonia in children. Prolonged exposure to tobacco smoke has been associated with acute and chronic health effects with a 20 to 30 percent increased risk of lung cancer if a woman is married to a man who smokes. Yet, without sufficient public pressure, many

governments have not taken adequate public health measures to protect the environmental health of women and children. This is particularly relevant in developing countries where legislation prohibiting tobacco use in public places may not be strictly enforced.

In addition to these epidemiological issues, Rowena Jacobs'paper on *Economic Policies, Taxation and Fiscal Measures* points out that tobacco control programmes must pay increasing attention to macroeconomic policies concerned with trade, taxation and price. In developing countries, rapid urbanization and changes in lifestyle and diet mean that noncommunicable diseases are now eating up scarce resources for treatment and medication. Countries'health systems designed to deal with problems such as malaria, diarrhea and other "poor country" diseases are unprepared for the huge costs of treating cancers and heart disease. For example, treatment of lung cancer that can help only about 10 percent of the affected people would cost $18,000 per year of life gained, but implementing tobacco-control prevention costs a fraction of that.

Growing evidence indicates that tobacco hampers sustainable development. According to the World Bank, the use of tobacco results in a net loss of billions of US dollars per year with half these losses occurring in developing countries (6). There are many direct and intangible costs that affect economic development, including tobacco's negative impact on the environment. Multinational companies gain the most, while tobacco farmers and women who work in tobacco production receive only a small percentage of the profits. Rural women must also cope with the possible negative impact of tobacco production on food production and the environment due to deforestation. In brief, tobacco has a negative impact on the health of economies as well as on people.

Structural adjustment and the global financial crisis have severely increased health costs for women and children. Thus, poor women have less access to cessation methods, health information and health services than ever before. In some industrialized countries, studies indicate that women who have little education or are unemployed, separated or divorced are at highest risk.

What are effective strategies and interventions? According to Nicola Christofides, in her paper on *How to Make Policies More Gender-Sensitive*, it is necessary to challenge the gender bias inherent in many existing health policies and tobacco control programmes. "Gender" is defined as the social, economic and cultural construct of the relations between men and women, and, as such, it underlies the social construction of tobacco promotion, consumption, treatment and health services. It also affects women's lack of participation in health policy decision-making. Thus, all policies, health services and programmes must be monitored and evaluated using gender indicators as well as those for conventional health.

Women activists at the Kobe conference cited a number of reasons why gender equality must underlie national and international programmes and strategies. Among the points they emphasized were:

- Women and girls, particularly among the poor, are often invisible in health statistics so that basic information concerning disease epidemiology, level of health knowledge and health impact is often unknown.
- Gender bias in health research and services is apparent in the quality of healthcare. Health professionals are often inadequately trained to address the needs of women so that tobacco use goes undetected and appropriate treatments for women are not available.
- In many tobacco control programmes, "women's concerns" are seen mainly as reproductive health issues. This reflects a male-biased tradition in which women are valued primarily in their role as reproducers, rather than throughout the life cycle. Furthermore, some health service providers place undue emphasis on the "rights of the unborn fetus," so that a woman's right to choose can be compromised, violating a fundamental right to sexual and reproductive health.
- When women are held primarily responsible for reproductive health, they are sometimes "blamed" for their addiction to tobacco and its negative impact on the child. Much less medical attention has been paid to the negative health effects of paternal smoking on fertility and the health of the fetus. Cessation programmes for fathers are seldom provided as part of reproductive health services.
- The majority of involuntary smokers are women and children. Yet, national policies are often weak and do not sufficiently address the rights of the passive smoker in health services and programmes. Passive smoke needs to be placed higher on a list of priorities to protect women and children's rights to a safe and smoke-free environment in homes as well as in public places.
- Tobacco control programmes seldom recognize women as potential leaders in tobacco control. However, unless women are empowered they cannot fully participate in tobacco control programmes. For example, if they are not equal decision-makers in the home, they are unable to influence partners to quit smoking (2).

There are a number of strategic actions that can help make a difference. A multi-pronged strategy that combines changes in legislation and fiscal policies along with gender-sensitive health education and cessation programs would be most effective. Finance, agriculture, trade, education, sports and science all have important roles to play in improving those areas of government which have a direct impact on people's lives and health. The private sector must also be involved. As Dr Brundtland noted at the Kobe conference,

> *Government action is not sufficient, however. I am urging the private sector to support tobacco control the way they are starting to support other public health programmes. The tobacco farmers will not be denied a hearing when the Framework Convention will be negotiated . . . WHO is working closely with FAO and agriculturists at the World Bank to study the possible long-term impact on farmers of a global reduction in the demand for tobacco (1).*

Fiscal and taxation policies are particularly strategic. For example, studies indicate that young smokers respond dramatically to an increase in prices and higher tobacco taxes. A recent World Bank study shows that raising taxes on tobacco brings down consumption and brings money into the state's coffers. A 10 percent increase in prices could lead to an average of 7 percent decrease in demand in developing countries and 4 percent in industrialized countries (6). It would discourage an onset of addiction and give quitters a greater incentive to stay tobacco-free. The effect is even stronger when a proportion of the excise tax is used to fund health promotion campaigns and to reduce smuggling. National monopolies also need to be reassessed in cases where governments partly or fully own tobacco companies. This is the case in many countries, such as China, Republic of Korea, Japan and France. Experience shows that governments become freer to act for public health when their own dependence on tobacco is reduced. Bans on advertising on all tobacco products and across all media are proven to reduce rates of addiction and to be cost-effective policy measures in tobacco control.

The World Health Organization has taken the lead in a global effort. In July l998, Dr Brundtland established a Cabinet project, the Tobacco Free Initiative (TFI), to coordinate an improved global strategic response to tobacco as an important public health issue. The long-term mission of global tobacco control is to reduce smoking prevalence and tobacco consumption in all countries, thereby reducing the burden of disease caused by tobacco. The TFI goals include efforts to build new and strengthen existing partnerships for action, accelerate national, regional and global strategy implementation and mobilize resources to support required actions. In partnership with other programmes in the WHO Cluster, regional and country offices, as well as with NGOs, women and youth groups, and the media, TFI will take a leadership role in promoting effective policies and interventions.

An important international tool will be the Framework Convention on Tobacco Control. At the World Health Assembly in 2000, government delegates representing 114 countries met in Geneva to consider the working groups'reports on the Framework Convention on Tobacco Control (7). They were joined by international NGO delegates, themselves representing hundreds of groups around the world, as well as United Nations agencies and the European Union. Public hearings were held in October 2000 and negotiations are currently underway.

Momentum is also building within the women's movement. The Fourth World Conference on Women in 1995, the International Conference on Population and Development in 1994, the international women's health movement in partnership with governments and the UN succeeded in placing a high priority on women's health. Charlotte Abaka, author of *Strengthening International Agreements*, writes that a woman's right to health is included in the Convention on the Elimination of all Forms of Discrimination Against Women which has been signed by 163 countries, including many tobacco-growing countries like China, Malawi, Zimbabwe and Indonesia. The CEDAW committee identified that governments' compliance with article 12 concerning women's health is central to the health and wellbeing of women. In 1995, CEDAW experts called upon governments to report for the first time on women and tobacco.

Also, noting the Tobacco Free Initiative proposed by the World Health Organization in July 1998, the Commission on the Status of Women, which oversees implementation of the Beijing Platform for Action, recommended that governments, the UN system and civil society design, implement and strengthen prevention programmes aimed at reducing tobacco use by women and girls. In addition, they should investigate the exploitation and targeting of young women by the tobacco industry; support action to prohibit tobacco advertising and access by minors to tobacco products; and support smoke-free spaces, gender-sensitive cessation programmes and product labeling to warn of the

danger of tobacco use. Similar recommendations were made by NGOs during a June 2000 workshop at the "Beijing Plus Five" summit of women's organization in New York.

Many governments have initiated effective tobacco control measures. For example, Japan banned smoking in all trains and several other public areas and supported this conference on tobacco and women. The United States has successfully used litigation against the tobacco industry that has helped to provide financial support for tobacco control. China has built a network of smoke-free schools, passed restrictive tobacco advertising ban laws and hosted the last World Conference on Tobacco Control in 1997. Sri Lanka and the Philippines have also initiated action to ban tobacco advertising and have strengthened the protection of children against smoking (2).

Around the world, NGOs are also doing their share. Health professional organizations of women physicians, nurses and scientists allied with the media have initiated community-based programmes that have contributed to women's involvement in tobacco control. Groups such as the International Network of Women Against Tobacco (INWAT), and the US National Organization of Women have pioneered community-based strategies. The Women's Environment and Development Organization, in collaboration with the WHO and Campaign for Tobacco-Free Kids, organized a meeting of their networks to plan activities on women and tobacco. Other groups like the Latin American and Caribbean Women's Health Network have provided health information on lung cancer and smoking through their newsletters. After the Kobe conference, women activists carried out media and public information campaigns in China, Laos, Thailand, Bangladesh, St. Kitts and Argentina, and more are being planned in 20 countries. Mobilization and leadership can make a difference. However, as Mabel Bianco, Margaretha Haglund, Yayori Matsui and Nobuko Nakano point out in their paper, *The International Women's Movement and Anti-Tobacco Campaigns*, the potential for women's leadership has only begun to be tapped.

Future efforts to curb the rising epidemic of tobacco use among women and girls must be built on solid evidence. However, improvements must be made in national databases, particularly in developing countries, as well as scientific studies concerning women and tobacco. Data are often unavailable or outdated concerning tobacco use or prevalence of tobacco-related diseases among women. When available, they may not be disaggregated to indicate important differences by age, ethnicity or occupation. Furthermore, very little is known about the health status of women involved in tobacco production and processing, such as India's bidi workers or family farm workers in Zimbabwe. Even less information is available about the wide variety of smokeless tobacco use such as chewing. Although some efforts are underway through the UN Interagency Committee on Tobacco Control coordinated by WHO, much more in-depth and qualitative studies are needed to understand these women's needs and health status. Finally, evaluations of tobacco control programmes are often gender-blind, and data seldom incorporate the views of women. Considerable improvements in financial assistance and methodologies are needed to evaluate the impact of tobacco control policies, including economic policies, on women's health. As the FCTC momentum builds, and as the international community rallies to reduce deaths caused by tobacco, the need for timely and accurate information will become even more critical. This book hopes to contribute to that body of knowledge by identifying what still needs to be known and what kinds of actions make a difference.

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Tobacco use AND ITS impact ON Health

Impact of Tobacco Use on Women's Health

Virginia L. Ernster

Cigarette smoking was initially adopted by men in developed countries, followed by women in those countries and men in developing countries. Only recently have women in developing countries begun to smoke. As a result, the epidemic of tobacco-related diseases is expanding from the developed world to the developing world, and tobacco use is increasingly becoming a major health issue for women as well as men. Globally, the prevalence of smoking among women in 1995 was estimated to be 12 percent, or approximately 236 million women (1).

The health effects of smoking in a population only become fully pronounced about a half-century after the habit is adopted by a sizeable percentage of young adults. Thus, most of what is known about the health effects of tobacco use among women comes from studies in developed countries, where women began smoking modern cigarettes decades ago and there has been adequate time to monitor the consequences. Despite the paucity of epidemiologic data on women in developing countries, there is no reason to think that female smokers will be spared the serious health effects of smoking. In those countries where female smoking is just becoming popular, it may be several decades before the full health impact is felt, but devastating health consequences are inevitable unless action is taken today. Data from developed countries suggest that total mortality is elevated by 80-90 percent or more among women who smoke compared with those who do not (2-4), with good evidence that risk increases as the amount and duration of smoking increases. Thus, risk of premature death for tens of millions of women worldwide is nearly doubled by a factor—namely, tobacco use—that is entirely preventable.

It is well established that lung cancer is generally rare in populations where smoking prevalence has been low and that it tends to increase following increases in smoking prevalence. Given this relation, lung cancer mortality rates—which are available for most countries of the world, even though accuracy and completeness of reporting may vary considerably—can serve as an indicator of the "maturity" of the tobacco epidemic across populations. Thus, this review will focus much more on lung cancer than on other smoking-related diseases. Still, it should be emphasized that lung cancer is only one of myriad adverse health consequences of smoking for women. Based on estimates provided by Peto et al. (5), lung cancer accounted for approximately 21 percent of all smoking-attributable deaths among women in developed countries in 1985; in other words, about 79 percent of tobacco's toll was due to diseases other than lung cancer. Moreover, lung cancer rates are a reflection of smoking patterns two to three decades earlier, so they are a very inadequate reflection of the more immediate health effects of smoking, such as adverse reproductive outcomes.

Most of what is known about the health effects of tobacco relates to the smoking of manufactured cigarettes, although in some areas of the world use of other forms of tobacco by women is common (e.g., smoking of traditional hand-rolled flavored cigarettes, use of snuff and other types of smokeless tobacco, and reverse cigarette smoking). Studies of the health effects of these forms of tobacco use are needed. Moreover, many women throughout the world are involved in tobacco agriculture and factory work. Although there are descriptions in the literature of some of the toxic effects of handling tobacco (6, 7), there has been little study of the health effects specific to women employed in tobacco production. For example, effects of such employment on pregnancy outcomes should be investigated. Finally, this chapter focuses on the health consequences of active smoking. The effects of exposure to environmental tobacco smoke are reviewed elsewhere in this monograph.

HEALTH EFFECTS OF SMOKING IN WOMEN

Effects of smoking on the health of infants and children

The infants of mothers who smoke during pregnancy have birth weights approximately 200-250 g lower, on average, than infants born to nonsmoking women (8-10), and they are more likely to be small for gestational age (11-14). Risks of stillbirth (15-18), neonatal death (15, 16, 19), and sudden infant death syndrome (20-23) are also greater among the offspring of women who smoke. In addition, it appears that breastfeeding is less common or of shorter duration among women who smoke than among female nonsmokers and that smokers who breastfeed may produce less breast milk than nonsmokers (24-27).

There are numerous effects of exposure to second-hand smoke on the health of children, particularly with respect to ear infections, lung function and asthma; these are reviewed elsewhere in this monograph in the chapter on environmental tobacco smoke. Older children and adolescents who are active smokers have increased risks of respiratory illness, cough, and phlegm production, slower rates of lung growth, reduced lung function and poorer lipid profiles than their nonsmoking counterparts (28).

Effects of smoking on reproduction and menstrual function

Compared with nonsmoking women, smokers are more likely to experience primary and secondary infertility (29, 30) and delays in conceiving (31-34). With respect to pregnancy outcomes, women who smoke are at increased risk of premature rupture of membranes, abruptio placentae (premature separation of the implanted placenta from the uterine wall), placenta previa (partial or total obstruction by the placenta of the cervical os) and preterm delivery (17, 35-51). As was noted above, their infants have lower average birth weights, are more likely to be small for gestational age and are at increased risk of stillbirth and perinatal mortality than are the infants of nonsmoking women. The prevalence of smoking during pregnancy exceeds 20-30 percent in many areas (52-59), and in light of the serious health consequences and the fact that pregnant women are highly motivated to ensure the health of their newborns, efforts to help pregnant women quit smoking (and to prevent postpartum relapse) should be a high priority in public health programs focusing on women and children.

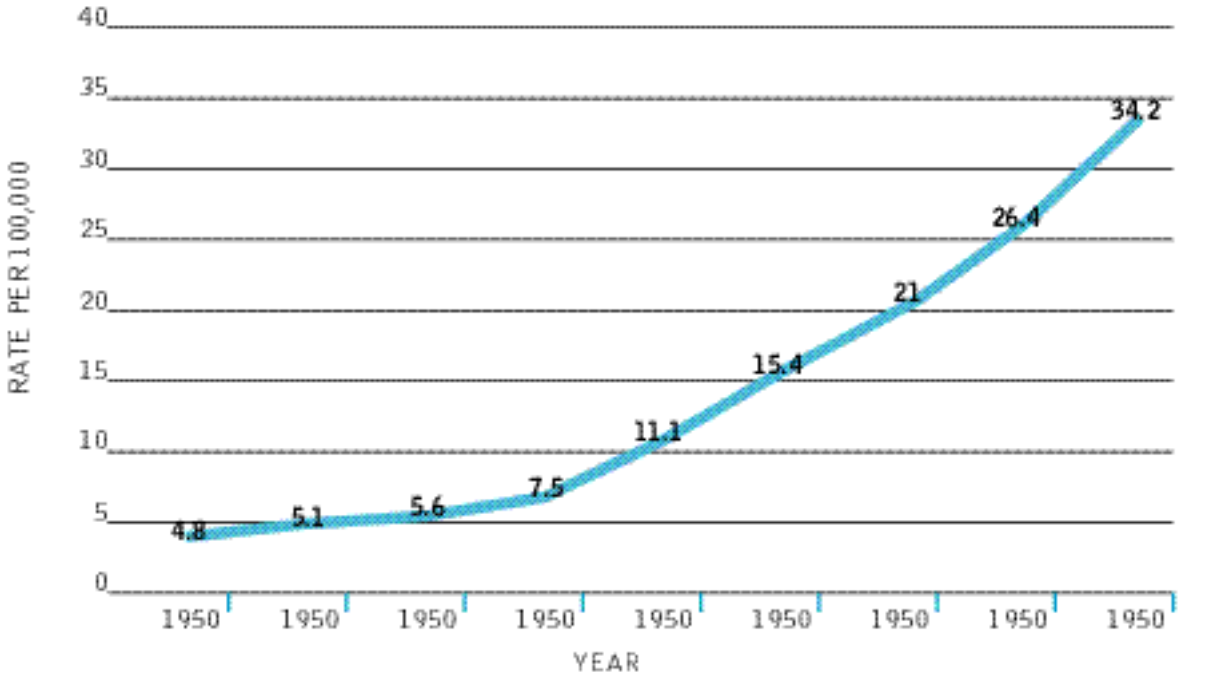
More studies of the effects of smoking on menstrual function, including menstrual regularity, are needed. From the evidence to date, it appears that women who smoke are more likely to experience dysmenorrhea (painful menstruation) (60-62) and premature menopause. On average, women who are current smokers go through menopause about 1-2 years earlier than nonsmoking women (63-66).

Effects of smoking on cardiovascular disease

In developed countries, cardiovascular diseases are the major causes of death among women as well as among men. Women who smoke have an increased risk of cardiovascular disease, including coronary heart disease, ischemic stroke and subarachnoid hemorrhage. Numerous prospective studies and case-control studies document that smoking is one of the major causes of coronary heart disease in women (2, 67-73). Relative risks of coronary heart disease associated with smoking are greater for younger women than for older women. Based on data from the American Cancer Society's Cancer Prevention Study II (CPS II) for 1982-1986, age-adjusted relative risks of coronary heart disease were 3.0 (95 percent confidence interval (CI): 2.5, 3.6) in women aged 35-64 years and 1.6 (95 percent CI: 1.4, 1.8) in women aged 65 years or more (74). In the 1980s, evidence suggested that smoking may account for a majority of cases of coronary heart disease among US women under the age of 50 (75). Risk of coronary heart disease increases with number of cigarettes smoked daily and with duration of smoking (69, 70). In the Nurses Health Study, current smokers who had begun to smoke before the age of 15 years had an estimated relative risk of 9.3 (95 percent CI: 5.3, 16.2) in comparison with never smokers (70).

Women who use oral contraceptives have a particularly elevated risk of coronary heart disease if they smoke (75, 76). Earlier studies found that use of oral contraceptives alone was associated with a moderate increase in coronary heart disease risk and that risk was 20- to 40-fold greater among women who both used oral contraceptives and smoked heavily compared with women who did neither (77, 78). More recent studies based on lower-dose formulations show overall risk of coronary heart disease associated with oral contraceptive use to be less than was observed with the first-generation formulations; however, the relative risk among smokers—especially heavy smokers—who use oral contraceptives is still markedly elevated compared with that among nonsmokers who do not use oral contraceptives (79-81). It is important that all women who wish to use oral contraceptives be informed of these risks and encouraged not to smoke.

FIGURE 1: AGE-ADJUSTED LUNG CANCER MORTALITY RATES PER 100,000 WOMEN, U.S., 1950-1995



Sources: (107, 186)

Women who smoke also have elevated risks of ischemic stroke and subarachnoid hemorrhage (2, 68, 82-85). In a meta-analysis published in 1989 that was based on 31 studies, risk of stroke among female smokers was 1.72 (95 percent CI: 1.59, 1.86) compared with never smokers (86). Among women younger than 65 years in CPS II, 55 percent (95 percent CI: 45, 65) of cerebrovascular deaths were attributed to smoking (74). Women who smoke also have significantly increased risks of carotid atherosclerosis (87-89), peripheral vascular atherosclerosis (90, 91) and death from ruptured abdominal aortic aneurysm (72, 92-94).

Effects of smoking on chronic obstructive pulmonary disease

Women who smoke have markedly increased risks of developing and dying of chronic obstructive pulmonary diseases, which include chronic bronchitis and emphysema with airflow obstruction (95, 96). In CPS II, the relative risk of chronic obstructive pulmonary disease was 12.8 (95 percent CI: 10.4, 15.9) in current smokers compared with nonsmokers (97). Risk increases with the number of cigarettes smoked per day (2). At the population level, increases in smoking prevalence have been followed by steep increases in chronic obstructive pulmonary disease mortality among US women (98, 99). Approximately 90 percent of chronic obstructive pulmonary disease among women in CPS II was attributed to smoking (97). Consistent with these findings, longitudinal studies have shown that lung function (as measured by forced expiratory volume in 1 second (FEV_1)) declines prematurely in women who smoke compared with nonsmokers (100-103).

Effects of smoking on cancer

In 1995, an estimated one-third of all cancer deaths in developed countries (47 percent of male cancer deaths and 14 percent of female cancer deaths) was attributable to smoking (5). Risks for many cancers are increased among women who smoke, including cancers of the lung, mouth, pharynx, esophagus, larynx, bladder, pancreas, kidney, and cervix and possibly other sites. Worldwide in 1990, approximately 10 percent of female cancer deaths resulted from smoking (104).

Lung cancer. Lung cancer was a rare disease among both men and women in the early decades of the 20th century. By the 1950s, it had become the leading cause of cancer death among men in many developed countries. By the 1970s and 1980s, lung cancer mortality rates were increasing among men in developing coun-

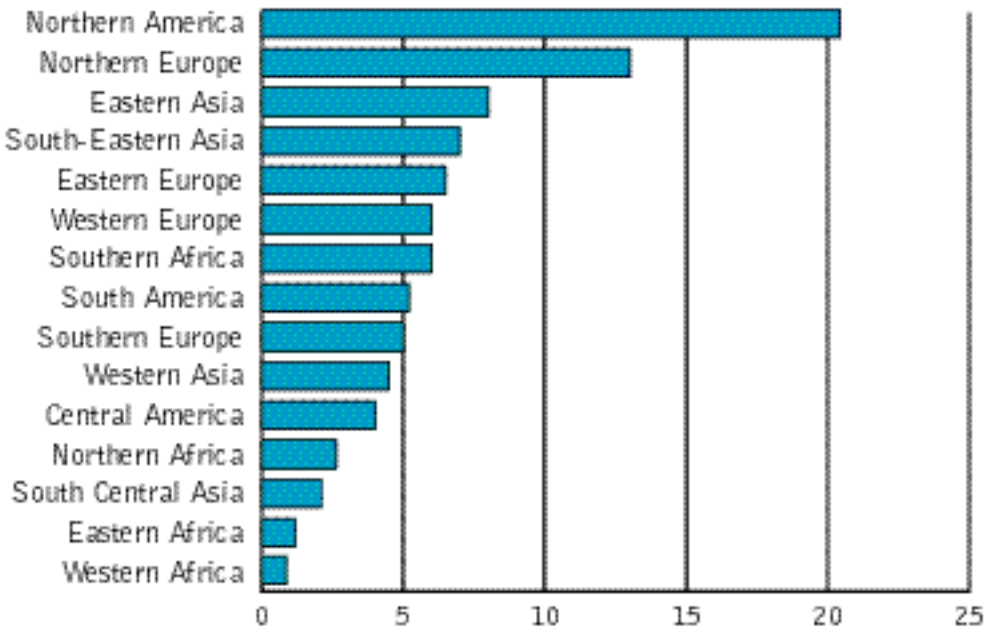
tries, as well as among women in many developed regions where female cigarette smoking was already well established (e.g., in North America, Northern Europe, and Australia/New Zealand). In 1950, lung cancer accounted for only about 3 percent of all cancer deaths in US women, but today it accounts for 25 percent (105). Among women aged 35-64 years in the 15 countries of the European Union combined, lung cancer death rates increased from 7.7 per 100,000 in 1955-1959 to 14.3 per 100,000 in 1990-1994 (106). Age-adjusted lung cancer mortality rates among US women have increased nearly 600 percent since 1950 (107) (see figure 1); by 1987, lung cancer had surpassed breast cancer to become the leading cause of cancer death among women in the United States. In countries where smoking among women became common relatively early in the 20th century, the vast majority of lung cancer deaths (about 90 percent in the United States (2)) are due to smoking (108).

Current lung cancer rates among women vary dramatically across countries (figure 2), reflecting historical differences in cigarette smoking across populations. Thus, lung cancer rates are intermediate or remain low in populations of women in whom smoking was adopted later or is still relatively uncommon. Even within countries, there can be dramatic differences in subgroups of the population. For example, in the United States, the lung cancer death rate in the state of Utah is less than half the national average (13.9 per 100,000 vs. 33.2 per 100,000) (109); the prevalence of smoking is much lower in Utah than in other states because of the predominance there of the Mormon religion, which proscribes smoking. Likewise, in the state of California, Asian women have much lower lung cancer death rates (24.9 per 100,000 during 1992-1996) than caucasian women (48.9 per 100,000) (110), reflecting historical differences in smoking prevalence between the two racial groups.

> By 1987, lung cancer had surpassed breast cancer to become the leading cause of cancer death among women in the United States

Dozens of epidemiologic studies consistently demonstrate that smoking is strongly associated with an increased risk of lung cancer in women, and that risk increases with duration and amount of smoking and decreases with time since smoking cessation (111-114). For example, in CPS II, which included over 676,000

FIGURE 2: AGE-STANDARDIZED LUNG CANCER MORTALITY RATES PER 100,000 WOMEN AGED 15-64 YEARS, BY WORLD REGION, 1990*



Mortality: ASR (World), per 100,000 (age 15-64)
Source: (117)

* Standardized to the world population
GLOBOCAN (ARC) 1998

women aged 30 years or more who were followed from 1982 through 1988, women who were current smokers at the time of enrollment were approximately 12 times more likely than nonsmokers to die of lung cancer during the follow-up period (2). The relative risk increased from 3.9 for women who smoked 1-9 cigarettes per day to 19.3 for women who smoked 40 cigarettes per day (2).

Among women in developed countries as a whole, lung cancer ranks third among all cancers in both number of new cases and deaths, after cancers of the breast and colon/rectum. Among women in developing countries as a whole, lung cancer ranks fifth among cancers in numbers of new cases and deaths, after cancers of the colon/rectum, cervix, breast and stomach (115-117). There were an estimated 228,000 deaths from lung cancer in 1990 among women worldwide (compared with 693,000 among men), accounting for 10.2 percent of all female cancer deaths (compared with 23.4 percent among men) (115). These numbers are expected to increase dramatically in the future, paralleling increases in female smoking prevalence in most countries of the world.

Not only is active smoking a well-established cause of lung cancer in women, but there are now many studies which document that exposure to environmental tobacco smoke increases the risk of lung cancer in nonsmoking women. This subject is covered in the section of this monograph on environmental tobacco smoke.

Other cancers. In addition to lung cancer, women who smoke have markedly increased risks of cancers of the mouth and pharynx (oral cancers), esophagus, larynx, bladder, pancreas and kidney (112, 118-131). Risk of cervical cancer also has been shown in many studies to be increased in smokers compared with nonsmokers. Although the extent to which this relation is independent of human papilloma virus infection is uncertain (132), at least two studies have found smoking to be significantly associated with cervical cancer after adjustment for human papilloma virus infection status (133, 134). There are also data suggesting increased risks of acute myeloid leukemia (135, 136) in women who smoke compared with nonsmokers, but further research is needed for this and other cancers. For several cancers in addition to lung cancer, including cancers of the larynx, pharynx and esophagus, the majority of deaths in the United States among men and women combined are attributable to smoking (137).

Effects of smoking on bone density and fractures

Although an effect of smoking on bone density has not been consistently demonstrated among pre- or perimenopausal women, many studies have found that postmenopausal women who smoke have lower bone densities than nonsmokers (138-143). Cohort studies of smoking in relation to hip fracture in women also have reported multivariate-adjusted relative risks ranging from 1.2 to 2 (144-148). There have been fewer studies, with less consistent results, of the association between smoking and risk of fracture at sites other than the hip.

Other health effects of smoking

Cigarette smoking and depression are strongly associated, although it is difficult to determine whether this reflects an effect of smoking on the etiology of depression, results from the use of smoking for self-medication by depressed individuals, or is due to common genetic or other factors that predispose people to both smoking and depression (149-156). Because depression is a major cause of morbidity worldwide and is more prevalent in women than in men, the relation between smoking and depression is an important one for women's health.

Risk of a number of other conditions is increased among women who smoke compared with nonsmokers. These include, but are not limited to, gallbladder disease (157-159), peptic ulcer (160-162), senile cataracts (163, 164) and facial wrinkling (92, 165, 166). While not necessarily life-threatening, these conditions can impact considerably on the quality of women's lives.

EFFECTS OF SMOKING ON TOTAL MORTALITY WORLDWIDE: Narrowing of the Gender Gap

In an important report by Peto et al. (108), mortality from smoking during 1955-1995 was estimated for the major populations of the world that are classified by the United Nations as "developed." Among persons of both genders, the proportion of all deaths attributed to smoking increased over time. However, the increase was relatively greater in women, resulting in a narrowing of the gender gap. In the age group 35-69 years, the proportion of all deaths due to smoking among women increased from 2 percent in 1955 to a projected 13 percent in 1995, while among men it increased from 20 percent to 36 percent. An estimated one in eight (13 percent) female deaths between the ages of 35 and 69 in

developed countries in 1995 was due to smoking, and for men and women combined, each smoker who dies in this age group loses an average of 22 years of life expectancy (108).

The proportion of deaths at all ages in all developed countries that was attributable to smoking in 1990 was estimated to be 24 percent among males and 7 percent among females (108). The number of smoking-attributable deaths among women of all ages in countries belonging to the Organization for Economic Collaboration and Development had increased from 12,000 in 1955 to an estimated 375,000 in 1995; among women in formerly socialist countries, the number increased from 14,000 in 1955 to 101,000 in 1995 (108). Use of tobacco, including smokeless tobacco, is estimated to have caused more than 100,000 female deaths in developing countries in 1995 (104).

Most of the smoking-attributable deaths worldwide to date have occurred in developed countries, but the situation will change dramatically in the coming century as the impact of rising smoking prevalence among women in the developing world is felt. It has been estimated that during the 1990s, among men and women combined, about two million smoking-attributable deaths occurred annually in developed countries and one million in developing countries. However, by the year 2025, the tables will turn and there will be an estimated three million such deaths every year in developed countries as compared with fully seven million in developing countries (108).

Given that deaths in the year 2025 will largely reflect smoking prevalence among young adults today, the majority of those deaths will still occur among men. However, women will account for an increasing proportion of all smoking-attributable deaths in coming years if the historical experience of the developed countries to date is any indication. In the United States, for example, in 1955 there were only 1,500 deaths attributable to smoking among women compared with 102,000 among men (in other words, one death in women for every 68 deaths in men). However, by 1995, there were 226,000 smoking-attributable deaths among women compared with 303,000 among men (or one death in women for every 1.34 in men) (108). The gender gap closes as smoking prevalence in women approximates that of men.

It is instructive to compare the experience of the United States, where smoking among women became common in the 1930s and 1940s and peaked (at about 33 percent) in the 1960s, with that of Japan, where female smoking prevalence has been low. The estimated proportion of deaths among US women aged 35-69 years that was attributable to smoking increased from 0.6 percent in 1955 to 15 percent in 1975 to 31 percent in 1995, while in Japanese women the increase was much less: from 0 percent in 1955 to 3 percent in 1975 to 4 percent in 1995 (108).

Women who quit smoking experience marked reductions in disease risks. Risk of coronary heart disease is markedly reduced within 1-2 years of smoking cessation.

Reports from CPS II (conducted during 1982-1988) suggest that perhaps as much as half (47.9 percent) of deaths among women who were current smokers at the time of enrollment in the study were attributable to their smoking (97). In other words, about half of persistent smokers in that study were eventually killed by their smoking. This proportion was higher than that for female smokers in the American Cancer Society's earlier CPS I study (1959-1965) (18.7 percent), reflecting the fact that female smokers in CPS I had started smoking later in life and had smoked fewer cigarettes per day than women in CPS II (97).

Based on a recent analysis of data from three large Danish population-based studies, it was estimated that among female smokers who inhaled, smokers of 15 or more cigarettes per day lost 9.4 years of life expectancy and lighter smokers lost 7.4 years compared with never smokers (167).

The benefits of smoking cessation

Women who quit smoking experience marked reductions in disease risks. Some of the best documented effects are discussed here, but the benefits are not limited to these conditions.

Many studies suggest that the infants of pregnant women who stop smoking by the first trimester have weight and body measurements similar to those of infants born to nonsmoking women (10, 12, 49, 168-171).

Risk of coronary heart disease is markedly reduced (by 25-50 percent) within 1-2 years of smoking cessation, followed by a continued but more gradual reduction to that of nonsmokers by approximately 10-15 years following cessation (70, 172-175). Stroke risk among

smokers also reverses with smoking cessation, with the estimated amount of time needed for risks to approximate those of never smokers ranging from less than 5 years of abstinence to 15 or more years of abstinence (82, 92, 173, 176).

Individuals who quit smoking experience a slowing in the decline of pulmonary function (92), a benefit that is considerably greater when cessation occurs at younger ages (102, 177), presumably because the cumulative adverse effects of smoking are fewer than in older smokers who quit. A small improvement in FEV1 occurs during the first year following cessation, and the rate of FEV1 decline slows in comparison with continuing smokers (178). Former smokers have lower relative risks of chronic obstructive pulmonary disease than continuing smokers, but in most studies their risks are still elevated compared with nonsmokers (95). A recent analysis based on a large cohort of US women suggests that risk of developing chronic bronchitis in former smokers approached that of never smokers approximately 5 years after quitting (96).

Risk of lung cancer and other cancers declines with duration of smoking cessation. Among female former smokers of 1-19 cigarettes per day in CPS II, the relative risk of lung cancer was 9.1 (compared with never smokers) after 1-2 years of quitting, and it declined to 2.9 after only 3-5 years of quitting. Among former smokers of 20 or more cigarettes per day, the relative risk was 9.1 for women who had quit 6-10 years previously (compared with never smokers) and declined to 2.6 with 16 or more years of smoking abstinence (92). Although risk of lung cancer in former smokers is dramatically reduced compared with continuing smokers, it may never completely decline to the low risk level of never smokers. Benefits of reduced tobacco consumption are now becoming apparent at the national level in some areas. For example, among US adult women, smoking prevalence has declined since the mid-1970s, and lung cancer incidence is now declining in all age groups under 60 years; in fact, overall age-adjusted lung cancer incidence rates appear to have peaked in the 1990s.

China: bad news for men but hope for women

Recent large-scale epidemiologic studies of smoking in relation to all-cause and cause-specific mortality among Chinese adults confirm the significant increases in overall risk associated with smoking previously seen in North America and Europe (179-181), although, at least in men, the principal causes of tobacco-related death are proportionately very different than in Western countries. Approximately two-thirds of Chinese males begin to smoke in early adult life, and it appears that about half of those men will eventually die as a result of their smoking, with the proportion of deaths attributed to smoking increasing from 12 percent in 1990 to 33 percent in the year 2030 (182). However, smoking prevalence among young Chinese women is low (183) and appears to be declining; if that continues, the proportion of smoking-attributable deaths among Chinese women would decline from 3 percent in 1990 to 1 percent in the year 2030 (182). Preventing an epidemic of tobacco-related diseases from occurring among women in China and other countries where female smoking prevalence is still low represents a tremendous public health opportunity.

Effects of use of other forms of tobacco

There have been few good epidemiologic studies of the health effects in women of using forms of tobacco other than modern cigarettes. However, this is an area that definitely requires further study, given that large numbers of women, especially in developing countries, have traditionally used oral snuff, practiced reverse smoking, smoked hand-rolled herbal or other traditional cigarettes, or used other forms of tobacco. A large case-control study in the southeastern United States reported a four-fold increase in risk of oral cancer among nonsmoking women who used dry snuff; among those who had used snuff for 50 or more years, the relative risk of cancers of the gum and buccal mucosa was 48.0 (184). A recent study of 61 Filipina reverse smokers reported that 96.7 percent exhibited palatal mucosal changes, including leukoplakia, mucosal thickening, fissuring, pigmentation, nodularity, erythema and ulceration (185).

Research gaps

Additional research on women and tobacco is needed in several areas.

- Much better population-level data on smoking prevalence among women are needed, especially for women in the developing world. Data collection should occur at regular time intervals, and standardized measures should be used to define various aspects of active and passive smoking so that comparisons over time and across populations can be made.
- High-quality population-based cancer incidence data are needed in order to monitor changes in tobacco-related cancers and to enable compilation of data across countries for better estimation of the worldwide impact of tobacco use on women's health.

- Studies of the possible modifying effects of lifestyle and environmental exposures on the disease risks associated with smoking are needed. This is especially true for women in the developing world, whose dietary, occupational, and other exposures may differ from those of women in the developed world, on whom most of the research to date has been conducted.
- Studies are needed to determine whether there are gender differences in susceptibility to nicotine addiction and whether women and men with similar smoking patterns experience different disease risks. There is some evidence that for the same amount of smoking, women experience increased risks of lung cancer and heart disease compared with men, but whether this is so requires further study.
- Studies are needed on women's understanding of the disease risks associated with tobacco use and of effective means of tobacco prevention and cessation among various subgroups of women.
- Studies are needed on the health effects unique to women of using forms of tobacco other than cigarettes, such as smokeless tobacco and pipes.
- Studies are needed to determine whether women who work in tobacco production experience increased disease risks, including any effects on the offspring of pregnant workers.

CONCLUSIONS

Smoking in women is causally associated with increased risk of developing and of dying from myriad diseases, including many cancers, cardiovascular disease, chronic obstructive pulmonary disease and others, as well as increased risk of adverse reproductive outcomes. During the latter half of the 20th century, tobacco-related diseases became epidemic among women in the developed world, following their adoption of cigarette smoking earlier in the century. Tobacco-related diseases now threaten to become epidemic among women in developing countries in the 21st century, unless dedicated efforts are undertaken to curb tobacco use. Preventing such an epidemic represents one of the greatest public health opportunities of our time.

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Passive Smoking, Women and Children

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Tobacco smoking, now and in the past, has primarily been a custom and addiction of men, leaving women and children as the majority of the world's passive or involuntary smokers. Of the world's adults, approximately 1.1 billion, or a third of the population, are estimated to be smokers (2), making involuntary inhalation of tobacco smoke almost unavoidable throughout the world.

Exposure to environmental tobacco smoke (ETS) in children is strongly associated with a number of adverse effects, particularly those involving the respiratory tract. In a 1999 report on ETS and children's health, the WHO stated, "The vast majority of children exposed to tobacco smoke do not choose to be exposed. Children's exposure is involuntary, arising from smoking, mainly by adults, in places where children live, work and play. Given that more than a thousand million adults smoke worldwide, WHO estimates that approximately 700 million, or almost half, of the world's children are exposed to ETS. This high exposure, coupled with the evidence that ETS causes illness in children, suggests that ETS constitutes a substantial public health threat for children" (3).

Because the home is a predominant location for smoking, women and children are exposed to tobacco smoke as they carry out their daily lives—doing tasks at home, eating, entertaining, and even sleeping. The exposures at home may be added to by exposures at work, at school, and in transport. Consequently, in many countries, women and children cannot avoid inhaling tobacco smoke. This may be particularly true in many countries in Asia and the Pacific region, where the majority of the men are smokers, while only a few percent of women smoke regularly (1).

This paper covers the full spectrum of issues related to passive smoking and women and children: 1) indicators of exposure and prevalence of exposure; 2) health effects of passive smoking; 3) intervention strategies; 4) policy recommendations; and 5) research gaps. We draw on the substantial literature on passive smoking throughout the world but emphasize evidence from the Asian and Pacific regions. This topic has been reviewed repeatedly (4, 5), and a 1999 WHO consultation focused on passive smoking and youth (3). We do not attempt to cover comprehensively the now extensive literature on involuntary smoking and disease; instead, we offer a synthesis of the evidence that targets those areas in which the findings support intervention and identify research needs in areas in which the evidence is not yet conclusive.

Definitions

The inhalation of tobacco smoke by nonsmokers has been variably referred to as "passive smoking" or "involuntary smoking." Cigarette smoke contains particles and gases generated by the combustion of tobacco, paper and additives at high temperatures. The smoke that is inhaled by nonsmokers also contaminates indoor spaces as well as outdoor environments and has often been referred to as "environmental tobacco smoke" or ETS. This smoke is the mixture of sidestream smoke released by the smoldering cigarette and the mainstream smoke that is exhaled by the smoker. Sidestream smoke, generated at lower temperatures and more reduced conditions than is mainstream smoke, tends to have higher concentrations of many of the toxins in cigarette smoke (6, 7). However, it is rapidly diluted as it travels away from the burning cigarette.

Environmental tobacco smoke is an inherently dynamic mixture that changes in characteristics and concentration from the time it is formed and the distance that the smoke has traveled. The smoke parti-

cles change in size and composition as gaseous components are volatilized and moisture content changes; gaseous elements of ETS may be adsorbed onto materials, and particle concentrations drop with both dilution and impaction on surfaces. Because of its dynamic nature, a specific quantitative definition of ETS cannot be offered, although one is not needed for either research or public health purposes. A variety of indicators of smoking as the source of ETS and of ETS itself can be measured.

INDICATORS OF ETS EXPOSURE

Exposure to ETS can take place in any of the environments where time is spent. A useful conceptual framework for considering exposure to ETS is offered by the microenvironmental model that describes personal exposure to ETS as the weighted sum of the concentrations of ETS in the microenvironments where time is spent and the weights supplied by the time spent in each (8). A microenvironment is a space, e.g., a room in a residence or an office area, with relatively uniform concentration of ETS during the time that is spent in that particular microenvironment. For research purposes and for considering health risks, personal exposure is the most relevant measure for evaluating and projecting risk. Within the framework of the microenvironmental model, we consider the contributions of various microenvironments to personal exposures of women and children to ETS.

For children, the microenvironmental model makes clear the dominance of exposures in the home, where children spend the majority of their time. Other microenvironments where children spend time are also potentially associated with exposure to ETS: transportation environments, public places and even schools. For women, the home is also a key microenvironment, but for employed women significant exposures may also take place in work environments and in transportation microenvironments, public places and other sites where leisure time is spent. Although not well characterized, it is likely that the interplay of family members within the home may heighten exposure because of the frequency of physical proximity of parents and children and of spouses within the home.

Within the framework set by the microenvironmental model, there are a number of useful indicators of exposure to ETS, ranging from surrogate indicators to direct measurements of exposure and of biomarkers, which are reflective of dose (Table 1). One useful surrogate, and the only indicator available for many countries, is the prevalence rate of smoking among men and women. Among adults, smoking tends to aggregate within couples so that the proportion of nonsmoking women married to smokers is not necessarily estimable under the independent assumption of smoking among husbands and wives. Nonetheless, the prevalence rates of smoking among men and women provide at least a measure of likelihood of exposure. For the countries of Asia, for example, which have very high smoking rates among men and low smoking rates among women, the prevalence data for men imply that the majority of women are exposed to tobacco smoke at home.

TABLE 1. INDICATORS OF ETS EXPOSURE

MEASURE	INDICATOR
Surrogate Measures	Prevalence of smoking in men and women
Indirect Measures	Report of ETS exposures:home and workplace
	Smoking in the household
	• Number of smokers
	• Parent smoking
	• Number of cigarettes smoked
	Smoking in the workplace
	• Presence of ETS
	• Number of smokers
Direct Measures	Concentration of ETS components
	• Nicotine
	• Respirable particles
	• Other markers
	Biomarker concentrations
	• Cotinine
	• Carboxyhemoglobin

The indirect measures listed in Table 1 are generally ascertained by questionnaire. These measures include self-reported exposure and descriptions of the source of ETS, such as smoking, in relevant microenvironments, most often the home and workplace. The components of ETS include a number of irritating and odiferous gaseous components, such as aldehydes. Nonsmokers typically identify the odor of ETS as annoying, and the threshold for detecting ETS is at low concentrations (9, 10). Self-reported exposure to ETS is thus a useful indicator of being exposed, although questionnaire reports of intensity of exposure are of uncertain validity.

Questionnaires have been used to ascertain the prevalence of passive smoking, with some using questions directly related to the WHO definition of passive smoking: exposure for at least 15 minutes per day more than 1 day per week.

Questionnaires have been used widely for research purposes to characterize smoking, the source of ETS, in the home and work environments. A simple mass-balance model gives the concentration of ETS as reflecting the rate of its generation, i.e., the number of smokers and of cigarettes smoked, the volume into which the smoke is released and the rate of removal by either air exchange or air cleaning (11). Information can be collected readily on smoking by the parents and other adults within the household (the source term), although reports of numbers of cigarettes smoked in the home are probably of lesser validity. For workplace environments, smoking by coworkers can be reported, although the complexity of workplace environments may preclude the determination of the numbers of smokers in the work area or the numbers of cigarettes smoked. The other determinants of ETS concentration, room volume, air exchange and removal are not readily determined by questionnaire and are assessed only for research purposes.

The direct measures of ETS exposure include measurement of concentrations of ETS components in the air and of ETS biomarker levels in biological specimens. Using the microenvironmental model, researchers can estimate ETS exposure by measuring the concentration of ETS in the home, workplace or other environments and then combining the concentration data with information on the time spent in the microenvironments where exposure took place. For example, to estimate ETS exposure in the home, the concentration of a marker in the air, e.g., nicotine, would be measured and the time spent in the home would be tracked, possibly with a time-activity diary that collects information on all locations where time is spent.

The selection of a particular ETS component for monitoring is largely based on technologic feasibility. Air can be sampled either actively, using a pump that passes air through a filter or a sorbent, or passively, using a badge that operates on the principle of diffusion. A number of ETS components have been proposed as potential indicators, including small particles in the respirable size range and the gases, nicotine and carbon monoxide; other proposed indicators include more specific measures of particles and other gaseous components (7, 12). The most widely studied components have been respirable particles, which are sampled actively with a pump and filter, and nicotine, which is present in the gas phase in ETS and is collectible with either active or passive sampling methods. The respirable particles in indoor air have sources other than active smoking and are nonspecific indicators of ETS; nicotine in air, by contrast, is highly specific, having smoking as its only source. Nicotine concentration can be measured readily using a passive filter badge, which is sufficiently small to be worn by a child or an adult or to be placed in a room (13).

Biomarkers of exposure are compounds that can be measured in biological materials such as blood, urine or saliva. Cotinine, a metabolite of nicotine, is a highly specific indicator of exposure to ETS in nonsmokers (14). Some foods contain small amounts of nicotine, but for most persons cotinine level offers a highly specific and sensitive indicator of ETS exposure (14). In nonsmokers, the half-life of cotinine is about 20 hours, so that the level of cotinine offers a measure of exposure to ETS over several days. It is an integrative measure, reflective of exposure to ETS in all environments where time has been spent. Cotinine can be readily measured in blood, urine and even saliva with either radioimmunoassay or chromotography. New methods for analysis extend the sensitivity to extremely low levels (14, 15). Carboxyhemoglobin is a far less sensitive and specific measure that is of little utility for involuntary smoking, although it is a more valid indicator of active smoking.

PREVALENCE OF EXPOSURE

Overview

We cannot readily estimate how much of the world's population is exposed to ETS because few countries routinely collect the relevant data. In fact, national estimates based on surveys are available only for a handful of countries, e. g., the United States and China. Nevertheless, since nearly 1.1 billion people who smoked cigarettes (including bidis) consumed a total of 5 billion cigarettes in 1995, it is reasonable to assume that ETS exposure is a prevalent and an important public health problem. This is particularly true for developing countries, where men smoke substantially more than women (49% versus 9%) (1). Some surveys of ETS exposure, however, have been conducted, using a variety of methods and definitions; most of these surveys have been carried out as part of specific research projects and were not intended to provide national esti-

mates. Given the widespread use of tobacco, we make the assumption that ETS exposure is common throughout the world. We then estimate the prevalence of passive smoking, using data on both active and passive smoking from several countries. We also address the prevalence of passive smoking in women and children. Finally, we use data from some small-scale surveys to characterize further the severity of ETS exposure in women and children.

Prevalence estimates of ETS exposure

In describing prevalence of ETS exposure, we note that various methods have been used to estimate the extent of exposure to ETS among nonsmokers. These range from simple questionnaire reports to measurements of tobacco combustion products in the air of indoor environments and of biomarkers of tobacco smoke in human fluids and tissues. Studies comparing questionnaire indexes of ETS exposure with levels of biomarkers have shown that these different indicators are correlated, although their results are not perfectly concordant. Consequently, there is variation in findings among studies that have used varying approaches, and true differences in exposure may not be separable from methodological differences among the studies.

Table 2 provides data from a number of recent population-based studies that have used questionnaires to characterize exposure. Some of these studies were national in scope, e.g., the national samples in China, Australia and the United States, while others were from states or specific localities. Several incorporated cotinine as a biomarker. Unfortunately, data from developing countries are quite limited.

In spite of the limitations of the data, Table 2 shows that involuntary exposure to ETS is frequent throughout the world. In the studies in the developed countries, close to half of children and adolescents were exposed, primarily at home. As predicted by the microenvironmental model of ETS exposure, smoking by household members was a prominent contributor to exposures of children. The workplace also contributed substantially to exposures for adults, both men and women.

The data from the national surveys are particularly informative. For example, in the 1996 national survey in China (16), of all current nonsmokers, 53.58 percent reported exposure to ETS, defined as being in the presence of passive smoke at least 15 minutes per day on more than 1 day a week. The prevalence rate of ETS exposure in women (57 percent) was higher than that in men (45 percent). The highest prevalence of exposure to ETS was in women in the reproductive age range (up to 60 percent), with higher exposure in the younger than in older age groups. The majority of passive smokers were exposed to ETS every day, with 71.2 percent reporting exposure at home, 25.0 percent reporting ETS exposure in their work environments and 32.5 percent in public places.

The Behavioral Risk Factor Surveillance System in the United States, a telephone survey system using a questionnaire, estimated the prevalence of ETS exposure at 37 percent in men and women over age 18 years in 1993 and at 31 percent in 1997 (17). National estimates are also available from several other surveys in the United States, including the National Health Interview Survey in 1988 (18), the National Health and Nutrition Examination Survey III (19) and the Hispanic Health and Nutrition Survey (20). These surveys indicate that ETS exposure was common in the United States through the early 1990s.

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More detailed information comes from a number of different states and for specific populations in the United States. Coultas et al. (21) used a population-based cross-sectional study and found that 39 percent of 1,360 Hispanic adults in New Mexico were exposed to ETS. Cummings et al. (22), using a questionnaire-based cross-sectional study, interviewed 663 nonsmokers and ex-smokers who attended the Roswell Park Memorial Institute cancer screening clinic in Buffalo, New York in 1986. They found that 28 percent of those interviewed reported exposure to ETS at work, 27 percent at home, 16 percent at restaurants and 11 percent at social gatherings.

Data from a 1988 nationwide survey in the United States show that about one half of US children under age 5 years are exposed to tobacco smoke (18). For more than a quarter of the children, exposure begins before birth. On the basis of the survey data, 42 percent of children in this age range were estimated to live in a household with a smoker. The probability of children's

TABLE 2: PREVALENCE OF ENVIRONMENTAL TOBACCO SMOKE (ETS) EXPOSURE – POPULATION-BASED STUDIES

REFERENCE	STUDY DESIGN AND POPULATION	RESULTS
Coultas et al.,1987 (21)	Cross-sectional study, 2,029 Hispanic children and adults in New Mexico (1,360 nonsmokers and exsmokers also had salivary cotinine measured)	Prevalence=39% 18 years+,48% 13-17 years, 45% 6-12 years,and 54% <5 years and infants; Mean salivary concentrations = 0 to 6 ng/ml;35% prevalence of cotinine in nonsmoking households
Somerville et al., 1988 (30)	Cross-sectional study, 4,337 children aged 5 to 11 years in England and 766 in Scotland,from the1982 National Health Interview Survey on Child Health in the United Kingdom	Prevalence=42% in England and 60% in Scotland
Chilmonczyk et al., 1990 (111)	Cross-sectional study, 518 infants,aged 6 to 8 weeks receiving routine well-child care in private physicians'offices in greater Portland,Maine	41% infants lived in a smoking household with urinary cotinine levels > 10 µg/L ;8% had urinary cotinine levels >10 µg/L among those with no smoking reported
Overpeck and Moss, 1991 (18)	Cross-sectional study, sample of 5,356 children < 5 years of age and under from the National Health Interview Survey in 1988	Approximately 50% of all U.S.children ≤ 5 years of age exposed to prenatal maternal smoking and/or ETS from household members after birth;28% had prenatal and postnatal exposure, 21% only after birth,1.2% prenatally
Borland et al., 1992 (112)	Cross-sectional study, sample of 7,301 nonsmokers from the larger study of Burns and Pierce, 1992	31.3% nonsmoking workers reported exposure at work ≥1 time in the preceding 2 weeks,35.8% males vs.22.9% females,41.9% < 25 years vs.26.4% for older workers, 43.1% with <12 years of education vs.18.6% with a college education
Burns and Pierce, 1992 (113)	Cross-sectional study, Head of household in 32,135 homes in California,contacted via stratified random-digit dialing from June 1990 to July 1991	32.2% children 5 to 11 years and 36.5% adolescents aged 12 to 17 years exposed at home
Jaakkola N et al., 1994 (114)	Population-based cross-sectional study, random sample of 1,003 children,aged 1 to 6 years in Espoo, Finland	25.2% reported ETS exposure at home, while 74.8% children did not,assessed by parent-completed questionnaire
Jenkins,1992 (115)	Cross-sectional study, telephone interviews with 1,579 English-speaking adults and 183 adolescents (12 to 17 years of age) with telephones in California	46% male adult nonsmokers exposed at work,15-23% exposed at other locations,35% female adult nonsmokers exposed at work,31% at other indoor locations,20% at home and 13% at outdoor locations;42% adolescents exposed at home and other indoor locations,13% at outdoor locations and 4.5% at school,54% children 6-11 years and 62% ≤ 5 years exposed at home
Jenkins et al.,1992 (115) and Lum S et al.,1994 (116)	Cross-sectional study, Same population as described above and another interview of 1,200 children aged ≤11 years (< 8 years old with a parent or guardian) from April 1989 to February 1990 in California	Prevalence for nonsmokers=43% for adults and 64% for adolescents (self-report);Among smokers and nonsmokers=61% for adults and 70% for adolescents during the day;Children, infants,and preschoolers reported 35% to 45% exposure, average duration=3.5 hours
Pierce et al.,1994 (117)	Cross-sectional study, Using the California Adult Tobacco Surveys in 1990,1992,1993 with 8,224 to 30,716 adults 18 years and older and 1,789 to 5,040 teenagers 12 to 17 years of age sampled	15.1% smoked prior to pregnancy and of these, 37.5% quit during the pregnancy (9.4% Californian women smoke during pregnancy);17.7% of those < 5 years of age exposed in their homes and 19.6% ≤17 years
Pletsch PK,1994 (20)	Cross-sectional study, 4,256 Hispanic women aged 12 to 49 years who participated in the Hispanic Health and Nutrition Examination Survey (HHANES) from 1982 to 1984	Age-specific household exposure for non-smokers was 31% to 62% for Mexican-Americans,22% to 59% for Puerto Ricans,and 40% to 53% for Cuban-Americans;59% Puerto Rican and 62%Cuban-American adolescents had high exposures
Yang GH et al., 1996 (16)	Cross-sectional study, 122,700 records (65,000 males and 57,000 females) of persons 15 years and older from the 1996 National Prevalence Survey of Smoking Pattern in China	Prevalence for males=45.5%,females=57%
Pirkle JL et al., 1996 (19)	Cross-sectional study, 9,744 adults aged 17 years or older from the NHANES III Study, 1988 to 1991	Prevalence for males=43.5%,females=32.9%;87.9% had detectable serum cotinine levels
Lister SM and Jorn LR,1998 (118)	Cross-sectional study, data from the ABS 1989-90 National Health Survey of parents and their children (n=4,281),aged 0 to 4 years, Australia	45% of children lived in households with ≥ 1 current smoker, 29% had a mother who smoked;Odds Ratio (OR)=1.52, 95% CI 1.19,1.94 for maternal smoking significantly associated with parent-reported asthma and OR=1.51,95% CI 1.26, 1.80 asthma wheeze

TABLE 2 (continued)

REFERENCE	STUDY DESIGN AND POPULATION	RESULTS
Kauffmann F et al., 1983 (119)	Cross-sectional study, data from the French Cooperative Study PAARC with spirometric measurements for 95% of participants,7,818 adult residents (3,915 men and 3,903 women) aged 25 to 49 years, living in 7 cities of France, 1975	Prevalence for males=4.2%,females=49.7%;nonsmoking participants with spouses who smoked at least 10 g.of tobacco a day had significantly lowered forced expiratory volume in 25-75 seconds (FEF25-75);women also had a significant difference in forced expiratory volume in 1 second (FEV1) and a dose-response relationship with amount of smoking from their husbands
Ware et al.,1984 (29)	Cohort study, 10,106 schoolchildren with respiratory illness in 6 U.S.communities,aged 6 to 9 years	Prevalence=68%;maternal smoking associated with 20 to 35% increase in childhood respiratory illness rates;FEV1 lower for children living with current smokers and lowest for those living with ex-smokers
Greenberg et al., 1989 (120)	Questionnaire-based cross-sectional study, mothers of 433 infants from a representative population of healthy neonates from 1986 to 1987 in North Carolina	55% lived in a household with at least one smoker; 42% of infants exposed during the week preceding data collection; cotinine detected in 60% of urine samples (median=121 ng/mg creatinine)
Cummings et al., 1990 (22)	Questionnaire-based cross-sectional study, Interview of 663 nonsmokers and ex-smokers who attended the Roswell Park Memorial Institute cancer screening clinic in 1986 in Buffalo, New York	28% reported exposure at work, 27% at home, 16% at restaurants, 11% at social gatherings, 10% in car or airplane, and 8% in public buildings;cotinine levels for self-reported nonsmokers ranged 0 to 85 ng/ml (average 8.84 ng/ml)
Dijkstra et al.,1990 (31)	Cohort study, Nonsmoking children,aged 6 to 12 years over a 2-year period, The Netherlands	Prevalence=66%;association between exposure to ETS in home and development of wheeze, based on lung function tests and questionnaire for respiratory symptoms
Sherrill et al.,1992 (32)	Longitudinal cohort study, 634 children,aged 9 to 15 years,New Zealand	Overall prevalence=40%; Parental smoking associated with mild reduction in FEV1/VC (forced expiratory volume in 1 second/vital capacity) in males,children with asthma had more serious and progressive reduction with parental smok-
Cummings,1994 (122)	Cross-sectional study, 339 currently employed nonsmokers who were exposed at home (n=122) and weren't exposed at home (n=217),using the same population as in Cummings,1990	81% employed nonsmokers exposed at work and home, 76% exposed only at work;ETS exposure at home not predictive of exposure at work;mean urinary cotinine levels=12.8 ng/ml (7.5 at home and 11 at work)
Thompson B et al., (123)1995	Cross-sectional study, 20,801 U.S.employees from 114 work sites	52.4% respondents reported being exposed to ETS at work
Kurtz ME et al., 1996 (124)	Questionnaire-based cross-sectional survey, sample of 675 African-American students enrolled in grades 5 through 12 in an urban public school district in Detroit,Michigan	Smoking rates higher among students with parents who smoked;48% reported parental smoking,46% reported maternal smoking
Brenner et al.,1997 (125)	Cross-sectional study, survey of 974 predominantly blue collar employees in a south German metal company	>60% nonsmoking blue collar workers affected by passive smoke at work;52% nonsmoking white collar workers exposed if smoking allowed in work area,and 18% if smoking not allowed
Steyn K et al.,1997 (24)	Questionnaire-based cross-sectional study, 394 pregnant women attending antenatal services in Johannesburg,Cape Town, Port Elizabeth, and Durban in urban South Africa,1992	Most women who smoked stopped or reduced tobacco use during their pregnancy;70% lived with at least one smoker in the house
Lam TH et al., 1998 (25)	Questionnaire-based cross-sectional study, sample of 6,304 students,aged 12 to 15 years,from 172 classes of 61 schools in Hong Kong	53.1% were living in a household with at least one smoker, 35.2% had one smoker only, 9.5% had two, and 2.5% had three or more smokers in the household;38% of fathers and 3.5% of mothers smoked

exposure to tobacco smoke doubled from the highest income and maternal education groups to the lowest.

A study of North Carolina (US) children showed that non-household sources of exposure may become important as the child ages (26). Between ages 3 weeks and 1 year, the proportion of the children studied who were reported to be exposed to ETS increased from 39 to 63 percent. This increase was accounted for by greater exposure to smoke from both household and non-household smokers, whether at home or in other locations. These findings imply that any control strategy devised for limiting children's exposure to ETS needs to address the home and other locations (27). Data from China on infants also point to the importance of the home. Astudy of paternal smoking and birth weight in Shanghai, China, was carried out by Zhang et al. (28) in 1986-1987. The investigators found that 58 percent of newborn babies were exposed to ETS from smoking, primarily by the father and less frequently by the mother. The study did not consider ETS exposure from other sources.

For older children, results of studies from several countries showed that 40-70 percent of children were exposed to ETS. For example, Ware et al. (29), in a study of schoolchildren in six US communities, reported that the proportion of children aged 6-9 years exposed to ETS was 68 percent in 1984. On the basis of the 1988 National Health Interview Survey on Child Health in the United Kingdom, Somerville et al. (30) reported that 42 and 60 percent of children aged 5-11 in England and Scotland, respectively, were exposed to ETS from parental smoking in 1988. Dijkstra et al. (31) reported that 66 percent of children aged 6-12 years in the Netherlands suffered from ETS exposure in 1990. Sherrill et al. (32) reported that 40 percent of children aged 9-15 years in New Zealand were exposed to ETS in 1992.

The majority of studies measuring costs of exposure of children and adults to ETS have been conducted in developed countries or in urban areas in developing countries, such as Shanghai and urban areas of South Africa. These studies confirm the prediction of widespread ETS exposure from the prevalence estimates of active smoking. Both the data on active smoking and the surveys of involuntary exposure to ETS document that women and children represent the predominant exposed groups.

HEALTH EFFECTS OF PASSIVE SMOKING

Overview

Evidence on the health risks of passive smoking comes from epidemiologic studies, which have directly assessed the associations of measures of ETS exposure with disease outcomes. Judgments about the causality of associations between ETS exposure and health outcomes are based not only on this epidemiologic evidence, but also on the extensive evidence derived from epidemiologic and toxicologic investigation on the health consequences of active smoking. The literature on passive smoking and health has been reviewed periodically, beginning as early as the 1971 report of the US Surgeon General (33). Particularly significant syntheses were the report of the US Surgeon General on involuntary smoking (6) and a report of the US National Research Council, published in 1986 (34), the risk assessment report by the US Environmental Protection Agency, published in 1992 (35), the comprehensive review of the California Environmental Protection Agency, published in 1997 (36), the report of the Scientific Committee on Tobacco in the United Kingdom, published in 1998 (5), and the WHO report on the international consultation on environmental tobacco smoke and child health, published in 1999 (3). Each of these reports involved systematic evaluation of the evidence to reach overall conclusions with regard to the evidence on ETS and disease. Principal conclusions are provided in Table 3 (3).

Causal conclusions were reached as early as 1986, when involuntary smoking was found by the International Agency for Research on Cancer (37), the US Surgeon General and the US National Research Council to be a cause of lung cancer in nonsmokers. Each of these reports interpreted the available epidemiologic evidence in the context of the wider understanding of active smoking and lung cancer. In spite of somewhat differing approaches for reaching a conclusion, the findings of the three reports were identical: involuntary smoking is a cause of lung cancer in nonsmokers. In 1986, the reports of the US Surgeon General and the National Research Council also addressed the then mounting evidence on adverse respiratory effects of ETS exposure for children. Subsequent reports identified further effects of ETS exposure on children, and the most recent reports have classified ETS as causing a number of adverse effects for exposed children (Table 4).

TABLE 3. ADVERSE EFFECTS FROM EXPOSURE TO TOBACCO SMOKE

HEALTH EFFECT	SG 1984[1]	SG 1986[2]	EPA 1992[3]	CALEPA 1997[4]	UK 1998[5]
Increased prevalence of respiratory illnesses	Yes/a	Yes/a	Yes/c	Yes/c	Yes/c
Decrement in pulmonary function	Yes/a	Yes/a	Yes/a	Yes/a	
Increased frequency of bronchitis,pneumonia	Yes/a	Yes/a	Yes/a	Yes/c	
Increase in chronic cough,phlegm		Yes/a			
Increased frequency of middle ear effusion		Yes/a	Yes/c	Yes/c	Yes/c
Increased severity of asthma episodes and symptoms			Yes/c	Yes/c	
Risk factor for new asthma			Yes/a	Yes/c	
Risk factor for SIDS				Yes/c	Yes/a
Risk factor for lung cancer in adults		Yes/c	Yes/c	Yes/c	Yes/c
Risk factor for heart disease in adults				Yes/c	Yes/c
Source:(3) Yes/a = association Yes/c = cause	1.(65)	2.(6)	3.(35)	4.(36)	5.(5)

TABLE 4. SUMMARY OF POOLED RANDOM EFFECTS ODDS RATIOS WITH 95% CONFIDENCE INTERVALS

	EITHER PARENT SMOKES			ONE PARENT SMOKES			BOTH PARENTS SMOKE			MOTHER ONLY SMOKES			FATHER ONLY SMOKES		
	OR	(95% CI)	(n)	OR	(95% CI)	(n)	OR	(95% CI)	(n)	OR	(95% CI)	(n)	OR	(95% CI)	(n)
Asthma	1.21	(1.10 to 1.34)	(21)[c]	1.04	(0.78 to 1.38)	(6)	1.50	(1.29 to 1.73)	(8)	1.36	(1.20 to 1.55)	(11)	1.07	(0.92 to 1.24)	(9)
Wheeze[a]	1.24	(1.17 to 1.31)	(30)[c]	1.18	(1.08 to 1.29)	(21)	1.47	(1.14 to 1.90)	(11)	1.28	(1.19 to 1.38)	(18)[d]	1.14	(1.06 to 1.23)	(10)
Cough	1.40	(1.27 to 1.53)	(30)[c]	1.29	(1.11 to 1.51)	(15)	1.67	(1.48 to 1.89)	(16)	1.40	(1.20 to 1.64)	(14)[d]	1.21	(1.09 to 1.34)	(9)
Phlegm[b]	1.35	(1.13 to 1.62)	(6)	1.25	(0.97 to 1.63)	(5)	1.46	(1.04 to 2.05)	(5)						
Breathlessness[b]	1.31	(1.08 to 1.59)	(6)												

Source:(53).
Note: Number of studies in parentheses
a Excluding EC study, in which the pooled odds ratio was 1.20.
b Data for phlegm and breathlessness restricted as several comparisons are based on fewer than five studies.
c Two age groups for reference 80 included as separate studies.
d Reference 82 included as three separate studies.

In this paper, we provide an overview of the now extensive data on adverse health effects of passive smoking on women and children, drawing on these synthesis reports and other reviews (4). The evidence is reviewed separately for women and children. For children, we draw extensively on the 1999 WHO consultation. We have tabulated the available studies on ETS and the health of women and children from Asian and Pacific Rim countries (Tables 5a-b). The evidence in these tables is only part of the overall evidence on ETS and it should not be interpreted by itself, without considering the totality of the evidence, which includes studies from many other countries.

Adverse effects of ETS exposure on children

Overview. In its 1999 consultation, the World Health Organization concurred with other reviewing bodies about the effects of passive smoking on children (Table 3). Exposure to ETS was found to be a cause of slightly reduced birth weight, lower respiratory illnesses, chron-

TABLE 5A: STUDIES INVESTIGATING ETS EXPOSURE AND LUNG CANCER IN THE PACIFIC RIM

REFERENCE	STUDY DESIGN AND POPULATION	RESULTS
Koo LC et al.,1985 (126)	Case-control study, 78 cases of "never-smoked" females from 1977 to 1980 and 137 "never-smoked" female controls in Hong Kong	No significant increase in Relative Risk (RR), RR squamous-cell=1.75,AR(%)=34.7; RR large-cell=1.44,Attributable Risk (AR)=23.8; RR small-cell=1.10,AR=6.6; RR adenocarcinoma=7.2,AR=7.2
Lam TH et al.,1987 (127)	Case-control study, 445 cases of Chinese female lung cancer patients confirmed pathologically and 445 age-matched Chinese female healthy neighborhood controls from 1983 to 1986 in Hong Kong	RR=1.65 (P<0.01,95% CI=1.16,2.35),RR for adenocarcinoma only cell type significant=2.12 (P=0.01,95% CI=1.32,3.39),both RRs had significant trends with daily amount smoked by husband
Koo LC et al.,1987 (128)	Case-control study, 88 "never-smoked" female lung cancer patients from 1981 to 1983 and 137 "never-smoked" district controls in Hong Kong	No dose-response relationships:Odds Ratio (OR)=1.83 (95% CI=0.65,5.11) for 1-10 cigarettes/day smoked by each household member (adjusted for age, number of live births,schooling, years since exposure ceased);OR=2.56 (95% CI=1.06,6.19) for 11-20 cigarettes/day;OR=1.21 (95% CI=0.51,2.86) for 21+ cigarettes/day
Wu-Williams AH et al., 1990 (129)	Hospital-based case-control study, 965 female cases and 959 age frequency-matched controls from 1985 to 1987 in the Shenyang and Harbin districts,China	RR=0.7 (95% CI=0.6,0.9) for non-smokers who lived with a spouse who smoked in Harbin,no dose-response relationship except for father's smoking in the presence of index case
Liu Z et al.,1991 (130)	Hospital-based case-control study, 110 newly-diagnosed lung cancer patients and 426 age, sex, occupation,and resident-matched controls from November 1985 to December 1986 in China	Non-smoking females OR=0.77 (95% CI=0.30, 1.96)
Liu Q et al.,1993 (131)	Hospital based case-control study, 224 male and 92 female incident lung cancer cases and individually matched hospital controls from June 1983 to June 1984 in Guangzhou,China	OR=2.9 (95% CI=1.2,7.3) for ≥20 cigarettes/day smoked by husband,OR=0.7 (95% CI=0.2,2.2) for 1-19 cigarettes/day; C^2 = 4.5,P=0.03 for trend test
Du YX et al.,1996 (132)	6,000 cases of lung cancer deaths over the past 9 years in Guangzhou,China;2 studies: 1) 120 participants (28 males and 92 females), 2) 75 cases of never-smoking females	ETS exposure not statistically associated
Gao, 1996 (133)	Review of epidemiological investigations	No association with ETS exposure
Koo LC,Ho JH, 1996 (130)	Four epidemiology studies over the past 15 years in Hong Kong: 1) Retrospective study of 200 cases and 200 neighborhood controls, 2) Cross-sectional study measuring NO_2 of 362 children and their mothers, 3) Site monitoring of 33 homes of airborne carcinogens, 4) Telephone survey of 500 women's dietary habits and air pollutant exposures	ETS exposure moderately high in Hong Kong (36% have current smokers at home)
Ko Y-C et al.,1997 (134)	Hospital-based case-control study, 117 interviewed female patients suffering from lung cancer (including 106 non-smokers) and 117 individually matched hospital controls from 1992 to 1993 in Kaohsiung, Taiwan	Odds Ratio (OR)=1.3,95% CI=0.7,2.5 for spouse smoking (socioeconomic status,residential area and education-adjusted),OR=1.0,95% CI=0.4,2.3 for cohabitant smoking
Wang TJ,Zhou B, 1996 (135)	Hospital-based case-control study, 135 newly-diagnosed lung cancer cases and 135 age and sex-matched controls from April 1992 to May 1994 in Shenyang,China	No association with ETS exposure;OR=2.25, 95% CI=1.01,5.17 for family history of cancer
Wang SY et al., 1996 (136)	Case-control study, 390 lung cancer cases (291 males, 99 females) and 390 individually matched controls from April 1992 to May 1994 in Guangdong,China	Females predominantly had adenocarcinoma (squamous cell carcinoma/ adenocarcinoma=1:2.7) and diagnosed at an earlier age than males,(P<0.0001);Exposure to ETS in home and work independent risk factor
Wang TJ,Zhou BS, 1997 (137)	Meta-analysis of six case-control studies,767 cases and 1193 controls from Shanghai,Guangzhou, Shenyang,Harbin,Xuanwei and Hong Kong	Overall OR=0.91 (95% CI=0.75,1.10),c2=4.51, P>0.25,no significant dose-response relationship
Shen XB et al., 1998 (138)	Case-control study, 70 adenocarcinoma lung cancer cases and 70 controls in Nanjing,China	No statistical association with ETS exposure; risk factors include chronic lung disease (OR=3.90),and family tumor history (OR=4.36)

ic respiratory symptoms, middle ear disease and reduced lung function. Maternal smoking was characterized as a major cause of sudden infant death syndrome (SIDS), but there was inconclusive evidence on the risk from postnatal exposure to ETS. The conclusions of the other recent reports, those from the California Environmental Protection Agency and the United Kingdom's Scientific Committee on Tobacco, were similar (Table 3). The individual effects are considered briefly below.

Fetal effects. Researchers have demonstrated that active smoking by mothers results in a variety of adverse health effects in children, postulated to result predominantly from transplacental exposure of the fetus to tobacco smoke components. Maternal smoking reduces birth weight (38, 39) and increases risk for SIDS, an association considered causal in the recent WHO consultation. ETS exposure of nonsmoking mothers is associated with reduced birth weight as well, although the extent of the reduction is far less than that for active maternal smoking during pregnancy. In a recent meta-analysis, the summary estimate of the reduction of birth weight associated with paternal smoking was only 28 g (40). A study carried out on urban pregnant women in South Africa found that 70 percent lived with at least one smoker and approximately 8-9 percent of women actually thought that passive smoking and active smoking were either good for their health or had no effect on their health or that of their babies (24).

Health effects on the child postnatally, resulting from either ETS exposure to the fetus or to the newborn child, include SIDS, and adverse effects on neuropsychologic development and physical growth. A number of components of ETS may produce these effects, including nicotine and carbon monoxide. Possible longer-term health effects of fetal ETS exposure include increased risk for childhood cancers of the brain, leukemia and lymphomas, among others. In the WHO consultation, the evidence on postnatal ETS exposure and risk of SIDS was found to be insufficient to support a causal conclusion. A meta-analysis of the evidence on childhood cancer through the time of the 1999 consultation and subsequently reported elsewhere did not show a significant association of ETS exposure with overall risk for childhood cancer or for leukemia (41).

Perinatal health effects. These health effects include reduced fetal growth, growth retardation and congenital abnormalities. In most studies, paternal smoking has been used as the exposure measure to assess the association between ETS exposure and these nonfatal perinatal health effects. Low birth weight was first reported in 1957 to be associated with maternal smoking (42), and maternal cigarette smoking during pregnancy is considered to be causally associated with low birth weight (38). Recent studies report lower birth weight for infants of nonsmoking women passively exposed to tobacco smoke during pregnancy (43, 44).

Other nonfatal perinatal health effects possibly associated with ETS exposure are growth retardation and congenital malformations, and a few studies looked at fatal perinatal health effects. Martin and Bracken (43) demonstrated a strong association with growth retardation in their 1986 study, and several more recent studies provide support (45, 46). The few studies conducted to assess the association between paternal smoking and congenital malformations (28, 47, 48) have demonstrated risks ranging from 1.2 to 2.6 for those exposed compared with those non-exposed.

Postnatal health effects. ETS exposure due to maternal or paternal smoking may lead to postnatal health effects, including increased risk for SIDS, reduced physical development, decrements in cognition and behavior and increased risk for childhood cancers. For cognition and behavior, evidence is limited and is not considered in this review.

SIDS. SIDS refers to the unexpected death of a seemingly healthy infant while asleep. Although maternal smoking during pregnancy has been causally associated with SIDS, these studies measured maternal smoking after pregnancy, along with paternal smoking and household smoking generally. In the WHO consultation, the evidence on passive smoking (i.e., postbirth) and SIDS was considered to be inconclusive, although there was some indication of increased risk (3).

Cancers. ETS exposure has been evaluated as a risk factor for the major childhood cancers. The evidence is limited and does not yet support conclusions about the causal nature of the observed associations. In a meta-analysis conducted for the WHO consultation and subsequently published elsewhere (41), the pooled estimate of the relative risk for any childhood cancer associated with maternal smoking was 1.11 (95 percent confidence interval (CI):1.00, 1.23) and that for leukemia was 1.14 (95 percent CI: 0.97, 1.33).

Lower respiratory tract illnesses in childhood. Lower respiratory tract illnesses are extremely common during childhood. Studies of involuntary smoking and

TABLE 5B: STUDIES INVESTIGATING ETS EXPOSURE AND OTHER RESPIRATORY HEALTH EFFECTS IN THE PACIFIC RIM

REFERENCE	STUDY DESIGN AND POPULATION	OUTCOME	RESULTS
Chen Y et al.,1986 (139)	Prospective cohort study, 1,058 newborns in Shanghai,China	Hospitalization for premature illness during first 18 months of life	Significant increase in both outcomes with level of smoking
Chen Y et al.,1988 (140)	Retrospective cohort study, 2,227 children born in one district of Shanghai,China and who did not move out of the district during their first 18 months of life in 1983	Hospitalization and diagnosis of respiratory disease during first 18 months of life via questionnaire	Sex,birthweight,feeding type, and father's education-adjusted incidence density ratio (IDR) =1.79 (95% CI=1.15,2.79) for 1-9 cigarettes/day;IDR=2.60 (95% CI=1.69, 4.00) for 10+ cigarettes/ day
Tupasi et al.,1988 (141)	Community-based cohort study, Children in selected households aged less than 5 years from April 1981 to March 1982 and September 1982 to September 1983 in metro Manila, Philippines	Acute respiratory infection (ARI)	RR comparing parental smoking to no parental smoking,mother only Odds Ratio (OR)=1.2 (95% CI=0.6, 2.1),father only OR=0.7 (95% CI=0.6,0.9),both parents OR=1.0 (95% CI=0.7,1.4)
Pandey MR et al., 1989 (142)	Prospective cohort study, 1,085 children aged less than 5 years in hill region, Nepal	ARI based on home visits	ARI rate doubled by parent smoking
Azizi BH,1990 (143)	Cross-sectional study, Children 7 to 12 years in Kuala Lampur	Spirometric and peak expiratory flow measurements	Children sharing rooms with adult smokers had significantly lower levels of forced expiratory volume in 25-75 seconds FEV_{25-75}
Tupasi TE et al., 1990 (144)	Prospective cohort study, 1,978 children aged less than 5 years in Manila, Philippines	ARI based on weekly interview	OR=1.2 comparing both parents smoking to neither, significant increase
Vathanophas K et al., 1990 (145)	Prospective cohort study, 674 children aged less than 5 years in Bangkok, Thailand	ARI based on field worker surveillance	No significant increase from either parent smoking, risk of lower respiratory infection doubled if family members smoked
Woodward A et al., 1990 (146)	Nested case-control study, 13,996 population from Adelaide, South Australia, 258 cases with respiratory illness scores in top 20%,231 controls from bottom 20%	Respiratory illness	Odds Ratio (OR)=2.06 (95% CI=1.25, 3.39) for maternal smoking in the first year of life, adjusted for parental history of respiratory illness,other smokers in the home, use of group child care, parent's occupation,and levels of maternal stress and social support; OR=1.75 (95% CI=1.03,3.0) for maternal smoking in first year without smoking in pregnancy
Azizi BH,1991 (147)	Cross-sectional study, 1,501 school children aged 7 to 12 years from July 1987 to October 1987 in Malaysia	Asthma	Link between parental smoking and chest wheeze or whistling and cough,and smoking in the home and bronchial asthma in young children
Sherril DL et al., 1992 (32)	Cohort study, 634 children aged 9 to 15 years living in New Zealand	Lung function	Parental smoking had serious,progressive effects in children with reported wheeze or asthma on FEV1/VC (forced expiratory volume in 25-75 seconds/vital capacity ratio) mean reduction=3.9%
Ford RPK,1993 (148)	Questionnaire-based cross-sectional study, 1916 mothers giving singleton births from January 1992 to May 1992 in the Canterbury region, New Zealand	Smoking rates	333 mothers smoked during at least some part of their pregnancy;90% of those who quit did so during the first trimester
Jin et al.,1993 (149)	Prospective cohort study, 1,007 live births who could be followed to 18 months of age in Shanghai,China	Bronchitis and pneumonia infections	Relative Risk (RR)=1.3,1.7,and 2.0 for 1-9,10-19,and 20-39 cigarettes smoked/day, respectively;Dose-response relationship (p=0.0002)

TABLE 5B (continued)

REFERENCE	STUDY DESIGN AND PARTICIPANTS	OUTCOME	RESULTS
Chen Y, 1994 (150)	Retrospective cohort study, 3,285 infants from the Jing-An (1,163 babies born between June 1 and December 31, 1981) and Chang-Ning (2,315 babies born in the last quarter of 1983) districts of the Epidemiologic Studies of Children's Health in Shanghai,China	Low birth weight and hospitalization for respiratory disease in the first 18 months of life	Birthweight < 2500 grams:Adjusted Odds Ratio (OR)=2.91,95% CI=0.96,2.03 for light smokers,Adjusted OR for heavy smokers=4.48,95% CI=2.07,9.73;Birthweight > 2500 grams:Adjusted OR for light smokers =1.4,95% CI=0.96,2.03,Adjusted OR for heavy smokers=1.61,95% CI=1.08,2.41
Haby MM et al.,1994 (151)	Cross-sectional study, 2,765 schoolchildren aged 8 to 11 years from two rural regions of NSW and from Sydney, Australia	Lung function,asthma, other respiratory effects	Forced expiratory volume in 1 second (FEV1), peak expiratory flow rate (PEFR),and forced mid-expiratory flow rate (FEF) all reduced
Flynn MG,1994 (152)	Questionnaire-based cross-sectional study, 487 Fijian and Indian fourth grade children with mean age 9.3 years living in the Nausori District (rural) of the Fiji Islands in May 1991	Respiratory symptoms in the last 12 months	Prevalence of wheezing > 1 time(s) in the last 12 months was similar in Fijians (19.8%) and Indians (19.4%);35.8% Fijian children had productive cough on most mornings vs. 23.9% Indian children,not significant after controlling for prevalence of smoker in the home
Shaw R, 1994 (155)	Questionnaire-based cross-sectional study, 708 Kawerau schoolchildren aed 8 to 13 years in 1992, New Zealand	Asthma symtoms and risk factors,parent-completed	Overall prevalence of current wheeze=21.3%; OR=1.4, 95% CI=1.0, 2.1 for those exposed to ETS from primary caregiver; multiple factors associated with asthma symptoms
Azizi BH, 1995	Hospital based case-cotrol study, 158 cases of children aged 1 month to 5 years hospitalized for the incident asthma and 201 controls of children from the same age group hospitalied for causes other than respiratory illness from February 1989 to May 1990 in Malaysia	Asthma and other respiratory illness	Sharing a bedroom with an adult smoker, OR=1.91, 95% CI=1.13, 3.21
Ponsonby et al. 1996 1996 (157)	Population-based cohort study, 6,109 live births from May 1, 1998 to April 30, 1993 and their mothers in Tasmania, Australia	Several birth outcomes	Good smoking hygiene (mother not smoking in the same room as baby): Odds Ratio (OR)=1.74 (95 CI=1.30, 2.33) for first birth, OR=1.69 (95% CI1.27, 2.23 for low birth weight,OR=1.39 (5% CI=1.02, 1.9) for private health insurance status
Rahman MM et al., 1997 (158)	Prospective cohort study, 965 children aged less than 5 years from July	Acute Respiratory Infection (ARI)	Significantly higher proportions In ARI-positive children, no risk reported
Behera D et al., 1998 (159)	Cross-sectional study, 200 schoolchildren from north India	Lung function	FEF 50% significantly less in passive smokers whose households used mixed fuels; peak expiratory flow rate (PEFR), PEFR% and forced expiratory volume in 25 seconds (FEF 5%) significantly less in passives smokers whose households used LPG fuel
Deshmukh JS et al., 1998 (160)	Community-based cohort study, 210 pregnant women from urban community in Nagpur, India	Several maternal factors	OR=1.19, 95% CI=1.01, 1.47 for any cough or phlegm symptoms with one smoking household member (adjusted for age, gender, area of residence, type of housing, and correlation within schools and classes),OR=1.38, 5% CI=1.19, 2.85 for three (P for trend <0.001)
Lam TH et al., 1998 (25)	Cross-sectional study, Survey administered to sample of 6304 students aged mostly 12 to 15 years from 172 classes of 61 schools in 1994	Respiratory illness, including nose and throat problems, cough and phlegm, and recent wheezing	OR=1.19, 5% CCI=1.01, 1.47 for any cough or phlegm symptoms with one smoking household member adjusted for age, gender, area of residence, type of housing, and correlation within schools and classes),OR=138, 95% CI=1.07, 1.79 for two smokers and OR1.85, 95% CI=1.19, 2.85 for three (P for trend <0.001)
Lister, SM, Jorm LR, 1998 (118)	Cross-sectional study, 4281 sample from the 1989-1990 National Health Survey of the Australian children aged 0 to 4 years	Parent-reported chronic or recent asthma and other respiratory effects	Maternal smoking associated with asthma (OR= 1.52; 95% CI=1.19, 1.94) and asthma wheeze (OR-1.15; 95% CI=1.26, 1.80),significant positive dose-response relationships; Population Attributable Risk =13%.

lower respiratory illnesses in childhood, including the more severe episodes of bronchitis and pneumonia, provided some of the earliest evidence on adverse effects of ETS (49, 50). Presumably, this association represents an increase in frequency or severity of illnesses that are infectious in etiology and not a direct response of the lung to the toxic components of ETS. Effects of exposure to tobacco smoke in utero on the airways may also play a role in the effect of postnatal exposure on risk for lower respiratory illnesses. Infants of mothers who smoke during pregnancy have evidence of damage to their airways during gestation on lung function testing shortly after birth, and this damage may increase the likelihood of having a more severe infection (4).

Investigations conducted throughout the world have demonstrated an increased risk of lower respiratory tract illness in infants with parents who smoked (51). These studies indicate a significantly increased frequency of bronchitis and pneumonia during the first year of life of children with parents who smoked. Strachan and Cook (51) reported a quantitative review of this information, combining data from 39 studies. Overall, the approximate increase in illness risk was 50 percent if either parent smoked, with an odds ratio for maternal smoking somewhat higher, at 1.72 (95 percent CI: 1.55, 1.91). Although the health outcome measures varied somewhat among the studies, the relative risks associated with involuntary smoking were similar, and dose-response relations with extent of parental smoking were demonstrable. Although most of the studies have shown that maternal smoking rather than paternal smoking underlies the increased risk of parental smoking, studies from China show that paternal smoking alone can increase incidence of lower respiratory illness (51, 52). In these studies, an effect of passive smoking has not been readily identified after the first year of life. During the first year of life, the strength of its effect may reflect higher exposures consequent to the time-activity patterns of young infants, which place them in proximity to cigarettes smoked by their mothers.

Respiratory symptoms and illness in children. Data from numerous surveys demonstrate a greater frequency of the most common respiratory symptoms: cough, phlegm and wheeze in the children of smokers (6, 36, 53). In these studies, the subjects have generally been schoolchildren, and the effects of parental smoking have been examined. Thus, the less prominent effects of passive smoking, in comparison with the studies of lower respiratory illness in infants, may reflect lower exposures to ETS by older children who spend less time with their parents.

Cook and Strachan (53) have recently conducted a quantitative summary of the relevant studies, including 41 of wheeze, 34 of chronic cough, seven of chronic phlegm and six of breathlessness. Overall, this synthesis indicates increased risk for respiratory symptoms for children whose parents smoke (53). There was even increased risk for breathlessness (OR 1.31, 95 percent CI: 1.08, 1.59). Having both parents smoke was associated with the highest levels of risk.

Childhood asthma. Exposure to ETS might cause asthma as a long-term consequence of the increased occurrence of lower respiratory infection in early childhood or through other pathophysiologic mechanisms, including inflammation of the respiratory epithelium (54, 55). The effect of ETS may also reflect, in part, the consequences of in utero exposure. Assessment of airways responsiveness shortly after birth has shown that infants whose mothers smoke during pregnancy have increased airways responsiveness, a characteristic of asthma, compared with those whose mothers do not smoke (56). Maternal smoking during pregnancy also reduces ventilatory function measured shortly after birth (57). These observations suggest that in utero exposures from maternal smoking may affect lung development and may increase risk for asthma and also for more severe lower respiratory illnesses, as reviewed above.

While the underlying mechanisms remain to be identified, the epidemiologic evidence linking ETS exposure and childhood asthma is mounting (36, 53). The synthesis by Cook and Strachan (53) shows a significant excess of childhood asthma if both parents or the mother smoke (Table 4).

Evidence also indicates that involuntary smoking worsens the status of those with asthma. For example, Murray and Morrison (58, 59) evaluated asthmatic children followed in a clinic. Level of lung function, symptom frequency and responsiveness to inhaled histamines were adversely affected by maternal smoking. Population studies have also shown increased airways responsiveness for ETS-exposed children with asthma (60, 61). The increased level of airways responsiveness associated with ETS exposure would be expected to increase the clinical severity of asthma. In this regard, exposure to smoking in the home has been shown to increase the number of emergency room visits made by asthmatic children (62). Asthmatic children with mothers who smoke are more likely to use asthma medications (63), a finding that confirms the clinically significant effects of ETS on children with asthma. Guidelines for the management of asthma all urge reduction of ETS exposure at home(64).

Lung growth and development. During childhood, measures of lung function increase, more or less parallel to the increase in height. On the basis of the primarily cross-sectional data available at the time, the 1984 report of the Surgeon General (65) concluded that the children of parents who smoked in comparison with those of nonsmokers had small reductions of lung function, but the long-term consequences of these changes were regarded as unknown. On the basis of further longitudinal evidence, the 1986 report (6) concluded that involuntary smoking reduces the rate of lung function growth during childhood. Evidence from cohort studies has continued to accumulate (36, 66). The WHO consultation noted the difficulty of separating effects of in utero exposure from those of childhood ETS exposure because most mothers who smoke while pregnant continue to do so after the birth of their children.

ETS and middle-ear disease in children. Numerous studies have addressed ETS exposure and middle-ear disease. Positive associations between ETS and otitis media have been consistently demonstrated in studies of the prospective cohort design, but not as consistently in case-control studies. This difference in findings may reflect the focus of the cohort studies on the first two years of life, the peak age of risk for middle ear disease. The case-control studies, on the other hand, have been directed at older children who are not at lower risk for otitis media. Exposure to ETS has been most consistently associated with recurrent otitis media and not with incident or single episodes of otitis media. In their 1997 meta-analysis, Cook and Strachan (53) found a pooled odds ratio of 1.48 (95 percent CI: 1.08, 2.04) for recurrent otitis media if either parent smoked, 1.38 (95 percent CI: 1.23, 1.55) for middle-ear effusions and 1.21 (95 percent CI: 0.95, 1.53) for outpatient or inpatient care for chronic otitis media or "glue ear."

The US Surgeon General's Office (6), the National Research Council (34) and the US Environmental Protection Agency (35) have all reviewed the literature on ETS and otitis media and have concluded that there is an association between ETS exposure and otitis media in children. The evidence to date supports a causal relation, as noted by the WHO consultation.

Health effects of involuntary smoking on adults

Lung cancer. In 1981, reports were published from Japan (67) and Greece (68) that indicated increased lung cancer risk in nonsmoking women married to cigarette smokers. Subsequently, this still-controversial association has been examined in many investigations conducted in the United States and other countries, including China. The association of involuntary smoking with lung cancer derives biologic plausibility from the presence of carcinogens in sidestream smoke and the lack of a documented threshold dose for respiratory carcinogenesis in active smokers (37, 69). Moreover, genotoxic activity, the ability to damage DNA, has been demonstrated for many components of ETS (70-72). Experimental exposure of nonsmokers to ETS leads to their excreting 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), a tobacco-specific carcinogen, in their urine (73). Nonsmokers, including children, exposed to ETS also have increased concentrations of adducts of tobacco-related carcinogens, that is detectable binding of the carcinogens to DNAof white blood cells, for example (74, 75).

The US Surgeon General's Office, the National Research Council and the US Environmental Protection Agency have all reviewed the literature on ETS and otitis media and have concluded that there is an association between ETS exposure and otitis media in children.

The first major studies on ETS and lung cancer were reported in 1981. The early report by Hirayama (67) was based on a prospective cohort study of 91,540 nonsmoking women in Japan. Standardized mortality ratios for lung cancer increased significantly with the amount smoked by the husbands. The findings could not be explained by confounding factors and were unchanged when follow-up of the study group was extended (76). On the basis of the same cohort, Hirayama also reported significantly increased risk for nonsmoking men married to wives who smoked 1-19 cigarettes and 20 or more cigarettes daily (76). In 1981, Trichopoulos et al. (68) also reported increased lung cancer risk in nonsmoking women married to cigarette smokers. These investigators conducted a case-control study in Athens, Greece, which included cases with a diagnosis other than for orthopedic disorders. The positive findings reported in 1981 were unchanged with subsequent expansion of the study population (77). By 1986, the evidence had mounted, and the three synthesis reports published in that year concluded that ETS was a cause of lung cancer (6, 34, 37).

In 1992, the US Environmental Protection Agency (35) published its risk assessment of ETS as a carcinogen. The agency's evaluation drew on the toxicologic evidence on ETS and the extensive literature on active smoking. A meta-analysis of the 31 studies published to that time was central to the decision to classify ETS as a class A carcinogen, i.e., a known human carcinogen. The meta-analysis considered the data from the epidemiologic studies by tiers of study quality and location and used an adjustment method for misclassification of smokers as neversmokers. Overall, the analysis found a significantly increased risk of lung cancer in never-smoking women married to smoking men; for the studies conducted in the United States, the estimated relative risk was 1.19 (90 percent CI: 1.04, 1.35).

The meta-analysis included pooled estimates by geographic region. The data from China and Hong Kong were notable for not showing the increased risk associated with passive smoking that was found in other regions (35). The epidemiologic characteristics of lung cancer in women in this region of the world have been distinct with a relatively high proportion of lung cancers in nonsmoking women. Explanations for this pattern have centered on exposures to cooking fumes and indoor air pollution from coal-fueled space heating.

The most recent meta-analysis (78) included 37 published studies. The excess risk of lung cancer for smokers married to nonsmokers was estimated as 24 percent (95 percent CI: 13 percent, 36 percent). Adjustment for potential bias and confounding by diet did not alter the estimate. This meta-analysis supported the recent conclusion of the United Kingdom's Scientific Committee on Tobacco and Health (5) that ETS is a cause of lung cancer.

ETS and coronary heart disease (CHD). Causal associations between active smoking and fatal and nonfatal CHD outcomes have long been demonstrated (38). The risk of CHD in active smokers increases with the amount and duration of cigarette smoking and decreases relatively quickly with cessation. Active cigarette smoking is considered to 1) increase the risk of cardiovascular disease by promoting atherosclerosis; 2) increase the tendency to thrombosis; 3) cause spasm of the coronary arteries; 4) increase the likelihood of cardiac arrhythmias; and 5) decrease the oxygen-carrying capacity of the blood (39). Glantz and Parmley (79) summarized the pathophysiologic mechanisms by which passive smoking might increase the risk of heart disease. It is biologically plausible that passive smoking could also be associated with increased risk for CHD through the same mechanisms considered relevant for active smoking, although the lower exposures to smoke components of the passive smoker have raised questions regarding the relevance of the mechanisms cited for active smoking.

Epidemiologic data first raised concern that passive smoking may increase risk for CHD with the 1985 report of Garland et al. (80), based on a cohort study in southern California. There are now more than 20 studies on the association between environmental tobacco smoke and cardiovascular disease. These studies assessed both fatal and nonfatal cardiovascular heart disease outcomes, and most used self-administered questionnaires to assess ETS exposure. They cover a wide range of populations, both geographically and racially. While many of the studies were conducted within the United States, studies were also conducted in Europe (Scotland, Italy, and the United Kingdom), Asia (Japan and China), South America (Argentina) and the South Pacific (Australia and New Zealand). The majority of the studies measured the effect of ETS exposure due to spousal smoking; however, some studies also assessed exposures from smoking by other household members or occurring at work or in transit. Only one study included measurement of exposure biomarkers.

While the risk estimates for ETS and CHD outcomes vary in these studies, they range from null to modestly significant increases in risk, with the risk for fatal outcomes generally higher and more significant. In a 1997 meta-analysis, Law et al. (81) estimated the excess risk from ETS exposure as 30 percent (95 percent CI: 22 percent, 38 percent) at age 65 years. The California Environmental Protection Agency (36) recently concluded that there is "an overall risk of 30 percent" for CHD due to exposure from ETS. The American Heart Association's Council on Cardiopulmonary and Critical Care has also concluded that environmental tobacco smoke both increases the risk of heart disease and is "a major preventable cause of cardiovascular disease and death" (82). This conclusion was echoed in 1998 by the Scientific Committee on Tobacco and Health in the United Kingdom (5).

Respiratory symptoms and illnesses in adults. Only a few cross-sectional investigations provide information on the association between respiratory symptoms in nonsmokers and involuntary exposure to tobacco smoke. These studies have primarily considered exposure outside the home. Consistent evidence of an effect of passive smoking on chronic respiratory symptoms in adults has not been found (83-89). Several studies suggest that passive smoking may cause acute respiratory morbidity, i.e., illnesses and symptoms (90-94).

Neither epidemiologic nor experimental studies have established the role of ETS in exacerbating asthma in adults (95). The acute responses of asthmatics to ETS have been assessed by exposing persons with asthma to tobacco smoke in a chamber. This experimental approach cannot be readily controlled because of the impossibility of blinding subjects to exposure to ETS. However, suggestibility does not appear to underlie physiologic responses of asthmatics of ETS (96). Of three studies involving exposure of unselected asthmatics to ETS (96-98), only one showed a definite adverse effect. Stankus et al. (99) recruited 21 asthmatics who reported exacerbation with exposure to ETS. With challenge in an exposure chamber at concentrations much greater than is typically encountered in indoor environments, seven of the subjects experienced a more than 20 percent decline in FEV1.

Lung function in adults. With regard to involuntary smoking and lung function in adults, exposure to passive smoking has been associated in cross-sectional investigations with reduction of several lung function measures. However, the findings have not been consistent, and methodological issues constrain interpretation of the findings. A conclusion cannot yet be reached on the effects of ETS exposure on lung function in adults. However, further research is warranted because of widespread exposure in workplaces and homes.

INTERVENTIONS TO CONTROL ETS EXPOSURE

Models and strategies for intervention

Because smoking in the home is unlikely to ever become the subject of legislation, interventions to reduce the exposures of women and children in the home need to cause changes in the smoking behavior of men—fathers and husbands.

The problem of smoking in the home is particularly difficult because legislation does not reach there, and in many cultures, it may not be acceptable for a woman to ask her husband not to smoke. We begin with a general review of methods for behavior change, but any approach needs to be culture specific. Over the past 2 decades, research programs have been established to identify and test the most effective methods for achieving individual behavior change. More precise quantification of personal health behavior and improved health outcomes have grown out of the partnership between behavioral health scientists and biomedical health experts (100, 101). The theories of behavior change can be classified into three broad groups, which are useful as a foundation for developing interventions to reduce exposures to ETS in the home. These are described in detail in the work by Glanz et al. (102).

The first group is based on intrapersonal theories of health behavior: the health belief model, the theory of reasoned action and its companion, the theory of planned behavior, the transtheoretical model, and theories of health and coping. These theories explain formation and change of individual health behavior with perceived susceptibility, perceived severity, perceived benefits and barriers, cues to action and self-efficacy.

The second group focuses on models of interpersonal health behavior, including the social cognitive theory, and two frameworks: social support and social networks, and provider-patient communication. For example, the social cognitive theory includes two key concepts: 1) cognitive frame of reference of the individual and 2) the processes by which the individual's cognitive frame could be changed. The social cognitive theory is a dynamic, multicomponent theory proposing that individuals derive an enhanced sense of self-efficacy or confidence over their health behavior through specific mechanisms: modeling, performance accomplishment, persuasion, and minimizing physiologic arousal (103). Due to the delineation of these mechanisms for affecting self-efficacy, the social cognitive theory can guide the development of a finely targeted intervention.

The third group relates to the critical role of organizations, large social institutions and communities in health enhancement, named community and group intervention models of health behavior change. The theories and frameworks can help professionals understand the health behavior of large groups, communities, organizations and coalitions and can guide organization-wide and community-wide health promotion and education interventions. These social systems are both viable and essential units of practice when widespread and long-term maintenance of behavior change and social change are important goals. Community-level models offer a framework for understanding how social systems function and change and how communities and organizations can be activated. They complement individually-oriented behavioral change goals with broad aims that include advocacy and policy development. Community-level models suggest strategies and initiatives that are planned and led by organizations and institutions whose missions are to protect and improve health; such organizations include schools, worksites, health care settings, community groups and governmental agencies. Other institutions for which health

TABLE 6. STRATEGIES FOR PREVENTION OF ETS EXPOSURE IN WOMEN AND CHILDREN

	INTERVENTION STRATEGY	
LOCATION	COMMUNITY LEVEL	INDIVIDUAL LEVEL
Public Places and Work Places	• Legislate and implement smoking ban • Communicate information on ETS exposure to health • Set up smoking areas • Improve ventilation equipment in all buildings	• Volunteer to monitor and advise smokers not to smoke in enclosed areas • Discourage children and adolescents from smoking • Help smokers quit
Home	• Provide information on ETS risks to parents or pregnant women through mass media and pediatricians • Improve ventilation equipment • Campaign for tobacco-free families • Change smoking practices around children	• Teach parents or pregnant women the risk of ETS exposure to children • Show parents how to ask smokers in the family or visitors not to smoke at their house, especially in the presence of children or pregnant women

enhancement is not a central mission, such as the mass media, may also play a critical role (102).

The five actions put forward in the notable Ottawa charter (developing public health policies, creating a supporting environment, strengthening community action, developing individual skills and orienting health services) reflect the above health promotion theories. These models for intervention, like the Ottawa charter, suggest that a two-level approach is needed in programs intended to reduce ETS exposure in the home. At the individual level, smokers need to learn that their smoking harms not only themselves but also their families. At the community level, programs are needed to make smoking at home unacceptable, particularly in the presence of children. We now turn to interventions to control ETS exposures of women and children that draw on these principles for children and women. As shown in Table 6, intervention strategies are needed at two levels.

At the community level, programs are needed that draw on governmental and nongovernmental resources, including the mass media. Governmental action can affect public places and work environments directly, but not the home. Actions to improve housing and building quality, such as increasing the exchange of indoor with outdoor air, may reduce ETS concentrations, but are likely to be costly and have only a small impact. On the other hand, modification of smoking behavior in the home may have substantial benefits for exposures of women and children. Some of the principal strategies are given below.

- At the national or local level, governments can enact laws to ban smoking in public places, particularly in hospitals and schools. If governments do not take action, then nongovernmental agencies and advocates should push the legislative process. Once a law or regulation is issued, effective implementation is needed, including a plan for enforcement. Preparation before implementation is crucial, such as posters and signs, setting up smoking areas and monitoring.

- There needs to be a plan to disseminate information through the mass media or by health warning labels on tobacco products. To assure effective dissemination, messages need to be clear, "user-friendly" and consistent. Multiple effective modalities are needed for dissemination.

- Programs should provide support or service through community empowerment and through the cooperation of multiple organizations.

At the individual level, the main strategies reflect comprehensive programs that provide essential information to the public along with the skills to create and maintain tobacco-free areas, including the home. Intervention at the individual level is key in addressing ETS exposure, as the home is the main site for ETS exposure. Interventions will need to be developed to target special populations, such as minorities and people at lower socioeconomic or educational levels. Small community projects can be developed, such as smoking cessation interventions for pregnant women or consulting pregnant women and prenatal care professionals in a variety of settings.

Current interventions to reduce ETS exposure in the global and regional areas

Legislation for reducing exposure to ETS at worksites and public places. The growth in our understanding of the disease risk associated with ETS exposure has been accompanied by the declining social accept-

ability of smoking and by a growing body of legislation and regulations against smoking in public places and workplaces. This has been accomplished primarily by government action at the local, state and national levels. Policies of banning smoking consist of laws and regulations involving the definition of "public place," which has mainly come to include public transportation, hospitals, elevators, indoor cultural or recreation facilities, schools, public meeting rooms and libraries.

Until 1995, about 150 countries among the 190 members states had some form of legislation controlling or restricting smoking in various public places and/or workplaces (1). Currently many countries are developing and implementing comprehensive legislation that restricts smoking in many public settings. The actions in the countries of the Southeast Asia and Western Pacific regions are listed in Table 7. The table shows that all countries except four (Brunei, Marshall, Naury and Tuvalu) have, to different extents, passed legislation related to controlling ETS exposure. Some countries have passed very extensive laws, while others have not because of the challenges of passing and implementing legislation.

For example, since the 1970s, the accumulating evidence on the health risks of involuntary smoking has been accompanied by a wave of social action regulating tobacco smoking in public places in the United States. Initiatives in both the public and the private sectors have aimed at protecting individuals from exposure to ETS by regulating the circumstances in which smoking is permitted. Legislative approaches have included laws at the federal and state levels. Congress has enacted no federal legislation restricting smoking in public places, although bills have been introduced in Congress several times since 1973, and regulations were proposed in 1994 by the Occupational Safety and Health Administration that addressed smoking in the workplace.

In the United States, control measures have largely taken place at the state and local levels. The pace of new legislation increased in the mid-1970s. Between 1970 and 1974, nine laws were enacted in eight states; between 1975 and 1979, 29 new laws were passed and 15 more states adopted smoking regulations. The rate of enactment by state legislatures increased throughout the 1970s until 1985. Several states had passed extremely stringent smoking regulations, while some cities had virtually banned all smoking in public places before 1995.

As a consequence of Australia's federal system of government, responsibility for tobacco control is split between the federal and state governments, with the states bearing a large part of the responsibility. In 1991, of the top 600 companies in Australia, 77 percent had implemented worksite smoking restrictions: 46 percent had a total ban on smoking at work and 31 percent had designated limited areas in which employees were permitted to smoke. In general, the larger the company, the more likely it was to have smoking restrictions in the worksite: 88 percent of Australian companies employing over 1,000 people had smoking restrictions compared with 56 percent of companies with fewer than 100 employees (102, 104). The reduction of smoking in the workplace is a potentially powerful means of reducing exposure to ETS for a large proportion of the adult population. The challenge that remains is to increase the number and proportion of small worksites that have implemented smoking restrictions. The abundance and the heterogeneous nature of small business are the major barriers to reaching and impacting on small businesses.

Although there is no overall evaluation of legislation to control ETS exposure, it is believed that legislation can reduce ETS exposure to different extents and levels. There are some workplace data and population-based data that show that legislation against ETS exposure can be effective. Marcus et al. (105) reported that employees in workplaces that allowed smoking in numerous locations were more than four times more likely to have detectable saliva cotinine concentrations than were those in workplaces with bans on smoking. Brownson et al. (106) assessed the impact of statewide clean indoor air legislation and examined self-reported ETS exposure data from 1990 to 1993. In measuring change over time, they found a slight decline in the ETS exposure of nonsmokers in the workplace (average in the prelaw period, 44.2 percent) that accelerated substantially after enactment of the state law. ETS exposure in the workplace remained at 34.7 percent in the final year of the study (1993), while exposure to ETS in the home remained constant over the study period.

Health education and information communication to protect children from ETS exposure at home. Dissemination of the findings of scientific evaluations of the health consequences of ETS exposure should be the foundation of any intervention strategy. The information on the adverse effects of ETS exposure is both a rationale for intervention and a tool for motivating behavior change. Without appropriate information, it will be difficult to form the popular consensus needed to develop and enforce more restrictive policies. In addition, the ability of governments to take action to protect children from exposure to ETS at home and in

TABLE 7. CURRENT TOBACCO CONTROL STRATEGIES IN THE SOUTH-EAST ASIAN AND WESTERN PACIFIC REGIONS

	SOUTH-EAST ASIA REGION
COUNTRIES	STRATEGY OF PROTECTION FOR NON-SMOKERS
Bangladesh	Administrative measures to create smoke-free areas have been implemented in hospitals,public transport, elevators,theatres, cinemas and government premises.Some other workplaces have taken voluntary measures to ensure smoke-free areas.
South Korea	Smoking is prohibited in restaurants,shops and railway waiting rooms.
India	In 1990,through an executive order, the government implemented a prohibition on smoking in all health care establishments, government offices,educational institutions,air-conditioned railway cars,buses and domestic passenger flights.
Indonesia	Three of the Government ministries are officially smoke-free, but this is not enforced.By regulation,all health facilities are smoke-free, although some doctors smoke in front of their patients.Schools up to the university level are smoke-free.Most air conditioned cinemas have regulations prohibiting smoking, while some restaurants have voluntary bans.Flights of less than two hours are smoke-free, but there are no laws or regulations regarding smoking on trains,on buses or in taxis.
Maldives	Smoking is banned in government office buildings.
Myanmar	Smoking is banned in hospitals and theatres and prohibited by administrative measures in public transport.
Nepal	Smoking was banned in public places in 1992.
Sri Lanka	Some controls in place.
Thailand	Since 1976,smoking has been prohibited in public places,and since 1985 in cinemas.1988: in cabinet meetings and all other meetings in Government House.1989: in all premises of Ministry of Public Health.1992: the Non-smokers'Health Protection Act was adopted, granted in a wide variety of public places.

family day care settings may be quite limited, as many of these facilities are unlicensed and unregulated. In spite of these potential stumbling blocks, children remain the most important target population, and the home is most predominant site of ETS exposure.

The experience in the United States offers a useful example. The Environmental Protection Agency (EPA) had some success in its initiative to characterize and then communicate the health risks of ETS exposure. Initially, the EPA completed its risk assessment, Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders (35). This risk assessment supported the conclusion that widespread exposure to ETS in the United States had a serious and substantial public health impact at the time of the assessment in 1992. The subsequent intervention was largely based in communications. The project developed clear, user-friendly messages and ensured consistency in messages by "knowing the audience," which is considered vital to effectiveness. The messages were authoritative, confident, friendly and easy to understand. Included were recommendations for reducing the health risks of ETS exposure.

The project then developed cooperative alliances with sources connected to and trusted by these key target audiences. Multiple sources can better access many of the diverse audiences, e.g., African Americans, Hispanics, Asian Americans, homeowners and renters, all of whom must be reached with information. These approaches made it possible to communicate these messages to millions of citizens and to empower them to make individual decisions to take action.

Projects to prevent ETS exposure in various target populations. Along with legislation and dissemination of information to large populations, implementing projects in special target populations is a key part of the strategy. Some countries have comprehensive projects to reduce ETS exposure.

Outside the home, the major potential source of ETS exposure for infants is the childcare setting, including both informal arrangements involving family and friends and formal child day care. At the local level, strategies should aim to increase awareness about the hazards of exposures of children to tobacco smoke. Intervention strategies designed to affect family dwellings require creating public awareness among smokers and nonsmokers of the dangers of ETS exposure, and smoking in homes (and cars), both by occupants and visitors to the home (or passengers in cars), should be discouraged when children are present.

Family day care is generally a locally run initiative, supervised by the local council, family and community services, church groups or private organizations. It is estimated that less than one half of these sites have a formal policy on smoking when caring for children (107). Area health services workers should approach the

TABLE 7. CURRENT TOBACCO CONTROL STRATEGIES IN THE SOUTH-EAST ASIAN AND WESTERN PACIFIC REGIONS (continued)

	WESTERN PACIFIC REGION
Australia	1988:Ban in all workplaces of the Federal Government,then in all public and private sectors.Successful legal action has spurred employers to provide all international flights completely smoke-free by July 1996.
Brunei	No
Cambodia	Partial ban
China	1949:ban smoking in public vehicles in all big cities;1986: in subways;1983:on domestic flights;1995:on all flights;smoking is banned on the Ministry of Health premises,partially in hospitals and other health facilities; 1994:Shanghai declared virtually all indoor public places smoke-free;1995:Beijing banned smoking in all indoor public places;1996: over 70 cities banned smoking in all indoor public spaces.
Cook Island	Partial ban
Fiji	Smoking is banned by regulation.
Japan	Partial ban
Kiribati	Some regulations on smoking in public places
Lao People's Democratic Republic	Some voluntary measures
Malaysia	Ban in government offices, flights
Marshall	No
Micronesia	Partial ban
Mongolia	Ban
Nauru	No
New Zealand	Ban
Niue	Partial ban
Palau	1992 legislation was passed banning smoking within Government Buildings.
Papua New Guinea	1987 Act prohibited smoking in many public places.
Philippines	Smoking is banned voluntarily in many hospitals;1995 law mandated that all public and private elementary and high schools and colleges become smoke-free.
Republic of Korea	1989: set up smoking areas;smoking is partially banned in public places;1994:Banned sale of duty-free cigarettes on all flights
Samoa	Partial ban
Singapore	1970:the first law restricting smoking in public places,later expanded to include additional locations.1989: banned on domestic air flights.
Solomon Islands	Partial ban
Tonga	1987:the Ministry of Health banned smoking in all hospitals. Partial ban in other public places.
Tuvalu	No
Vanuatu	Partial ban
Vietnam	The Law on Health Protection adopted by the National Assembly in 1989 stipulates no smoking in halls, cinemas and theatres.In 1995,the Ministry of Health issued instructions to prohibit smoking in all health facilities. Several other ministries have followed,banning smoking in their offices.Smoking is banned on domestic flights.

supervising authority to assist in developing a policy of not smoking when caring for children under a family day care scheme. Strategies that can be used in implementing nonsmoking policies (108) include:

- Holding workshops for caregivers that focus on issues such as positive role modeling, health effects of passive smoking, possibility of future liability and the effect of a nonsmoking policy on the caregivers' health;
- Circulating information on the health effects of passive smoking, particularly in relation to children;
- Developing formal agreements with caregivers, as part of their duty to the children under their care, that the home will be a smoke-free zone when children are present, and issuing signs to indicate this;
- Conducting unannounced home inspection visits; and
- Issuing written cautions and counseling if the agreement is breached.

Projects at the local level can be successful in reducing ETS exposure with good design and implementation. The focus of these projects should be on protecting

children from ETS exposure and could include intervention by pediatricians, physician screening and counseling and home-based intervention programs.

Greenberg et al. (109) conducted a randomized controlled trial to determine whether a home-based intervention program could reduce infant passive smoking and lower respiratory illness. The intervention consisted of four home-nurse visits during the first 6 months of life and was designed to assist families to reduce the infant's exposure to tobacco smoke. Among the 121 infants of smoking mothers who completed the study, there was a significant difference in trends over the year between the intervention and the control group in the amount of exposure to tobacco smoke. Infants in the intervention group were exposed to 5.9 fewer cigarettes per day at age 12 months. The prevalence of persistent lower respiratory symptoms was lower among intervention-group infants of smoking mothers whose head of household had no education beyond high school (intervention group, 14.6 percent; and control group, 34.0) (109).

> Projects at the local level can be successful in reducing ETS exposure with good design and implementation. The focus of these projects should be on protecting children from ETS exposure.

However, the long-term evaluation of a pediatric practice-based intervention was somewhat inconclusive. Severson et al. (110) carried out a study in 49 Oregon pediatric offices where they enrolled 2,901 women who were currently smoking or had quit for pregnancy. They used a brief survey at the newborn's first office visit and randomly assigned offices provided advice and materials to mothers at each well-care visit during the first 6 months postpartum to promote quitting or relapse prevention. The results showed that the intervention reduced smoking (5.9 vs. 2.7 percent) and relapse (55 vs. 45 percent at six-month follow-up), but logistic regression analysis at 12 months revealed no significant treatment effect.

There are few reports of evaluations of intervention from developing countries. It is unlikely that the practice and experience of developed areas can be applied directly to other countries due to differences in culture, social norms and structure.

Comprehensive intervention actions. It is important for developing countries to combine interventions to reduce ETS exposure with more comprehensive tobacco control actions. These countries face the threat of rising active smoking and the inevitable increase in passive smoking that will follow. The intervention in Thailand is an example of effective implementation: Thailand, though a developing country with many other serious health problems that compete for attention, has adopted a successful, comprehensive tobacco control program in the face of a large number of adverse factors. It is both a tobacco-growing and a tobacco-manufacturing country, and tobacco use is widespread. Thailand, like its Southeast Asian neighbors, was threatened with trade sanctions if the domestic market was not opened to the importation of American cigarettes, but the Thai government resisted this threat. Eventually, a panel of the General Agreement on Tariffs and Trade resolved the matter by ruling that the ban on imports was not justified, but, that in the interests of protecting public health, a number of other tobacco control measures could be undertaken. The 1992 Tobacco Products Control Act prohibits all forms of cigarette advertising and sales promotion, including the use of free samples, price reductions and gift and coupon schemes. Besides the above intervention actions, the 1992 Non-smokers' Health Protection Act authorizes the Ministry of Public Health to designate certain public places as nonsmoking areas. Owners of establishments that are designated as such areas are likely to face fines, as are individuals who smoke in nonsmoking areas. Regulations to designate specific nonsmoking areas are under development in the Ministry of Public Health. Enforcement officials from several government departments are responsible for ensuring that the new restrictions on tobacco advertising and marketing and on smoking in public places are respected. These intervention actions should help to strengthen each other and increase the likelihood of success.

SUMMARY

Most countries have passed legislation banning smoking in public places or workplaces, but, for some, the ban applies to very limited locations, and enforcement is variable or ineffective. Communicating information about ETS by mass media is a very effective method, as demonstrated by the US EPA case study, and this method should be promoted in other countries. Community projects to improve the individual's knowledge and skills for conducting interventions on ETS exposure are other useful strategies. Every country needs a comprehensive strategy for intervention against

ETS exposure, as well as improvement of individual skills through community projects.

In addition, interventions against ETS exposure should be a part of a national plan for tobacco control. The elements of the plan should include legislation, health education, and communication, with the following goals: 1) to prevent children from becoming addicted to tobacco; 2) to implement effective cessation programs; 3) to progressively eliminate tobacco advertising; and 4) to enact financial measures to discourage tobacco consumption. The success of such strategies has been proven by using case studies of countries with long-standing comprehensive tobacco control policies.

RECOMMENDATIONS

A review on the health effects, prevalence and intervention activities related to ETS exposure has been carried out in this paper. We offer a series of recommendations below for both action and research, as they are complementary. They follow the general areas of regulation, communication and community intervention directed at women and children. Although the evidence is sparse or still incomplete for many countries, it is not premature to recommend formulating intervention activities and identifying research goals.

Regulation

Generally, a high prevalence of ETS exposure can be assumed wherever there is a high prevalence of smoking, especially for children and women in countries where the smoking prevalence is very high among men. Many countries have legislated smoking bans in public places or workplaces; however, laws or regulations are not always effective, as many are not enforced. Public policies to eliminate ETS exposure should be increased in frequency and scope.

Recommendations for action include:

- Organize and mobilize to encourage governments to take legislative action toward reducing ETS exposure;
- Guarantee effective implementation by establishing monitoring teams and institutions;
- Evaluate the effectiveness of the existing legislation;
- Develop community projects to improve individual knowledge and skills for interventions on ETS exposure is a key strategy in communicating the risks of ETS exposure;
- Develop compelling, clear, user-friendly messages and ensure consistency in messages targeting varying populations and cultural societies. As no single message could fit a variety of populations and languages, it is necessary to design the message to fit the population;
- Develop more channels with more partners to access various target populations;
- Train more health care workers to master communication skills, especially in developing countries;
- Develop Tobacco-Free Family campaigns at the community level;
- Develop and extend Tobacco-Free School and Tobacco-Free Hospital projects to prevent ETS exposure in public places;
- Protect pregnant women from ETS exposure through family planning projects. Include prevention of ETS exposure in the family planning process at a time when prospective parents should be receptive to the potential for harm to the fetus and child;
- Select reasonable objectives, define target populations, identify strategies and establish training programs. Academic institutions, international organizations and a variety of non-governmental organizations should partner to produce and implement these training programs.

Recommendations for research include:

- Introduce policy studies, especially in developing countries, as imperfect enforcement systems may weaken or may complicate antismoking laws in some countries;
- Investigate barriers to policy issues and smoking bans. It is unclear what barriers affect the implementation of policies within some countries or cultures;
- Better characterize the target populations for intervention and assess the impact of culture and socioeconomic factors in determining the outcome of intervention;
- Study communication methods suitable to the different populations;
- Investigate the differing populations and cultures in an effort to develop feasible projects in different locations.

Surveillance data for evaluation

Surveillance and evaluation are necessary measures to guarantee the project's success.

- Monitor exposure prevalence levels and trends and the health impacts of ETS exposure to assess the impact of legislation, communication and interventions;

- Include surveillance on ETS exposure in the global surveillance of tobacco control;
- Seek and develop effective indicators of measuring ETS exposure;
- Develop standard definitions of these indicators;
- Develop a standard questionnaire for measuring ETS exposure;
- Develop or use a standard sampling procedure;
- Develop an effective and economic evaluating strategy for controlling ETS exposure.

Comprehensive tobacco control

Control measures for ETS exposure and other tobacco-related policies, including taxation, smoking cessation projects, restriction on youth access to tobacco, and restrictions on international trade, can serve to strengthen each other in the war against the tobacco epidemic. With this underlying principle in mind, as well as sensitivity to the differing populations receiving the messages about the dangers of tobacco exposure, researchers and policy makers should move forward with implementing ETS control measures. It is not too soon to begin protecting those whose exposure is not of their own choosing.

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Why women and girls USE Tobacco

Initiation and Maintenance of Tobacco Use

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Tobacco consumption fell over the last 20 years in most developed countries, such as Australia, Britain, Canada, New Zealand, the USAand most Northern European countries. Consumption among men peaked around 1970 in many countries, but patterns among women are more uncertain. In the United States, the prevalence of smoking increased steadily from the 1930s and reached a peak in 1964 when more than 40 percent of all adult Americans smoked. Since then, smoking prevalence has decreased and reached 25 percent in 1993 (1). In Japan, the smoking rate was highest in 1966. The numbers of adult male and female smokers have respectively declined from 84 percent and 18 percent in 1966 to 59 percent and 15 percent in 1996 (2). In the UK, total cigarette consumption has fallen from 138 billion to 80 billion cigarettes per year over the last two decades (3).

In contrast, tobacco consumption is increasing in developing countries by about 3.4 percent per annum. Overall, the ratio of average cigarette consumption per adult between developed and developing countries has narrowed from 3.3 in the early 1970s to 1.8 in the early 1990s. Just as the gap has narrowed between developed and developing countries, it is clearly narrowing between men and women. The tobacco epidemic is being mirrored between men and women and is spreading its focus from men in high-income countries to men in developing countries and women in both developed and developing countries. And just as the gap between men and women and between developed and developing countries is narrowing, it is broadening the divide between socioeconomic groups. For example in the UK, there has been a significant decrease in smoking over time by women in the upper socioeconomic groups and by men in all age and socioeconomic groups (3). The exception in both cases was the very low socioeconomic groups where both men and women continued to smoke.

The different histories of tobacco use among men and women reflect different sociocultural constraints, which have acted at different times in different countries to discourage tobacco use among women. However, these constraints have weakened in many countries, and smoking prevalence among women has risen, often accelerated by aggressive marketing campaigns targeted directly at girls and women. In some countries, the prevalence of smoking among girls and women is still rising. This pattern, which has been seen in many industrialized countries throughout this century, seems likely to be repeated in developing countries during the next century unless effective tobacco control measures are implemented.

The reasons that will motivate women to continue smoking are quite different from those pushing young girls to start. Initiation factors are complex and different, not only between developed and developing countries, but also between different groups within a country. Maintenance of tobacco use is due both to nicotine dependence and to the difficulties in quitting which stem from various psychosocial and environmental factors.

This paper will discuss the prevalence of tobacco use and explore the factors that influence the initiation and maintenance of tobacco use among girls and women. The predominance of examples from developed countries is not deliberate but is an indication of lack of research on initiation and maintenance factors in developing countries. The paper will also discuss components of tobacco prevention and control strategies. Recommendations about future policy directions will be outlined.

PREVALENCE OF SMOKING

It is estimated that in 1995, there were about 1.1 billion smokers in the world (or 30 percent of the global population aged 15 years and above) who consumed

TABLE 1: GLOBAL PREVALENCE OF SMOKING, AND NUMBER OF SMOKERS, BY AGE AND GENDER, 1995

	MALES		FEMALES		TOTAL		
AGE CATE-GORIES	PREVA-LENCE	NUMBER OF SMOKERS	PREVA-LENCE	NUMBER OF SMOKERS	PREVA-LENCE	NUMBER OF SMOKERS	(% OF TOTAL SMOKERS)
	(%)	(millions)	(%)	(millions)	(%)	(millions)	
15-19	33	86	5	13	19	98	8
20-29	42	212	12	58	27	271	23
30-39	57	234	15	61	36	295	26
40-49	58	181	15	46	37	227	20
50-59	51	107	12	25	31	132	11
60+	40	101	11	34	25	134	12
Total	47	921	12	236	30	1,157	100
% of total		80		20		100	

Source:(5)

almost 6 trillion units of cigarettes and bidis annually (4). For both males and females, there is wide variation in smoking prevalence from one region to another. Amongst females, the prevalence of smoking is highest in Europe and Central Asia. Globally, the prevalence of daily smoking is higher for men (47 percent) than for women (12 percent) and males account for 80 percent of all smokers (roughly 920 million), as shown in Table 1 (5). As for the global prevalence of smoking by age, it is highest among persons aged 30 to 39 years and lowest amongst youth aged 15 to 19 years (19 percent). These trends in age-specific smoking prevalence are similar for both males and females.

TABLE 2: SMOKING PREVALENCE BY SOCIO-ECONOMIC STATUS, GENDER AND NUMBER OF SMOKERS AGED 15 OR MORE, 1995

	SMOKING PREVALENCE (%)			NUMBER OF SMOKERS	TOTAL SMOKERS
	MALE	FEMALE	OVERALL	(MILLIONS)	(% OF ALL SMOKERS)
Low / Middle Income	49	10	30	948	82
High Income	39	22	30	209	18
World	47	12	30	1157	100

Source:(6)

There is also a significant socio-economic aspect to tobacco use (Table 2). While the practice of smoking has become more prevalent among men in low- and middle-income countries, it has been in overall decline among men in the high-income countries. More than 55 percent of men in the United States smoked at the peak of consumption in the mid-20th century, but the proportion had fallen to 28 percent by the mid-1990s (Table 3). Per capita consumption for the populations of the high-income countries as a whole also has dropped. However among women and teenagers in these countries, the proportion that smoke has grown in the 1990s. Overall then, the smoking epidemic is spreading from its original focus among men in high-income countries, to men in low-income regions and women in both high- and low-income countries.

Historically as incomes have risen within populations, the number of smokers has risen too. In the earlier decades of the smoking epidemic in high-income countries, smokers were more likely to be affluent than poor. But in the past three to four decades this pattern seems to have been reversed, at least among men. Affluent men in the high-income countries have increasingly abandoned tobacco, whereas poorer men have not done so.

TABLE 3: PREVALENCE OF CIGARETTE SMOKING IN MEN AND WOMEN IN SELECTED COUNTRIES

COUNTRY	SMOKING PREVALENCE (%)		YEAR
	MEN	WOMEN	
Australia	29.0	21.0	1993
Austria	42.0	27.0	1992
Bahamas	19.3	3.8	1989
Belgium	31.0	19.0	1993
Canada	31.0	29.0	1991
China	56.0	6.0	1991
Cyprus	42.5	7.2	1990
Denmark	37.0	37.0	1993
Finland	27.0	19.0	1994
France	40.0	27.0	1993
Germany	36.8	21.5	1992
Iceland	31.0	28.0	1994
Ireland	29.0	28.0	1993
Israel	45.0	30.0	1989
Italy	38.0	26.0	1994
Japan	59.0	14.8	1994
Korea, Rep.	68.2	6.7	1989
Kuwait	52.0	12.0	1991
Luxembourg	32.0	26.0	1993
Netherlands	36.0	29.0	1994
New Zealand	24.0	22.0	1992
Norway	36.4	35.5	1994
Portugal	38.0	15.0	1994
Singapore	32.0	3.0	1995
Spain	48.0	25.0	1993
Sweden	22.0	24.0	1994
Switzerland	36.0	26.0	1992
United Kingdom	28.0	26.0	1994
USA	27.7	22.5	1993

Source:(5)
Note:Prevalence calculated based on data from WHO (4)

Research into women's smoking patterns is much more limited. Where women have been smoking for several decades, the relationship between socioeconomic status and smoking is similar to that seen in men. In most high-income countries, there are significant differences in smoking prevalence between the different socioeconomic groups. In the United Kingdom, for instance, only 10 percent of women and 12 percent of men in the highest socioeconomic groups are smokers, whereas in the lowest socioeconomic groups the figures are 35 and 40 percent respectively (5).

As seen in Table 2 (6), low- and middle-income countries account for the majority of the world's smokers (82 percent or 948 million). Males in low-income countries have a higher prevalence of daily smoking (49 percent) than do males in high-income countries (39 percent), while the reverse is true for females (10 percent in low-income countries and 22 percent in high-income countries). These data may of course reflect some under-reporting of smoking among women particularly from countries where it is socially and culturally unacceptable for women to smoke.

When comparing prevalence rates between men and women, a generally consistent finding is that smoking rates are higher among men than women. However, there is also considerable variation between countries where the rates among men and women are nearly equal, such as in the USAand the UK, or even higher among women, such as in Sweden. In countries like China, though, less than 6 percent of women are daily smokers compared to 56 percent of men, as shown in Table 3 (5). More than reflecting random variation, these differences reflect different stages of the smoking epidemic in each country.

As seen in Table 4 (7), prevalence rates among women vary considerably across developed and developing countries from as much as 58 percent in Nepal and over one-third in European countries, such as Denmark and Poland, to barely detectable levels in many African countries.

Of the annual world consumption of 6 trillion cigarettes and bidis, three-quarters are consumed in low-income countries. The relative consumption of units by age and gender is in fact very similar to the age and gender distribution of the world's smokers (Table 1). As seen in Figure 1(5), daily consumption per smoker is highest in high-income countries, where both males and females smoke around 20 cigarettes a day. Globally there is little difference between the genders in terms of the smoking rate of existing smokers, even though prevalence rates may be different.

TABLE 4: PREVALENCE OF CIGARETTE SMOKING AMONG WOMEN IN SELECTED COUNTRIES

	PREVALENCE (%)	DATE OF SURVEY
Americas		
Bolivia	38	1986
Brazil	33	1990
Guyana	4	-
Honduras	11	1988
Jamaica	27	1988
Trinidad and Tobago	5	1986-89
USA	26	1990
Europe		
Denmark	45	1988
France	30	1991
Germany	27	1988
Poland	35	1989
Portugal	12	1988
Spain	28	1988
UK	28	1992
Africa		
Ivory Coast	1	1981
Guinea	1	1981
Nigeria	10	1990
Swaziland	7	1989
Zambia	4-7	1984
South Africa	17	1995
Eastern Mediterranean		
Bahrain	20	1985
Egypt	2	1981
Sudan	19	1986
Tunisia	6	1984
South East Asia		
India	0-67*	-
Indonesia	10	1990
Nepal	58	1991
Thailand	4	1988
Western Pacific		
Australia	27	1986-89
China	5	1991
Japan	14	1990
Malaysia	5	1990
New Zealand	26	1986-89
Singapore	2	1988

Sources: (7,8)

*Note: Depends on area surveyed

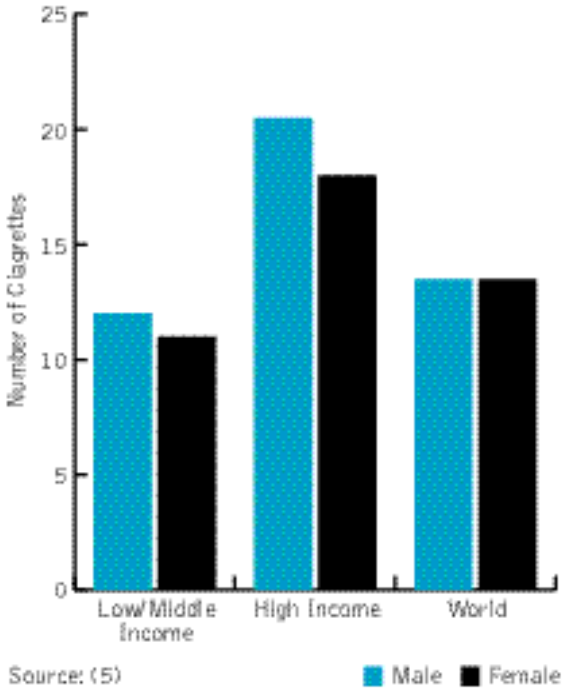
Table 5 (5) shows the number of cigarettes smoked per day for men and women aged 15 and older in selected countries. It can be seen that in several countries the smoking rates are identical for men and women,

notably Hong Kong, Ireland, Italy, Singapore, South Korea and Spain.

In developing countries, many forms of tobacco may be used in addition to cigarettes. For example, cigarette smoking among women is not widely accepted in Indian society. However according to a study conducted among urban women in India in 1998, about 2 to 5 percent of women smoke cigarettes (9). This study explored the knowledge and attitudes of cigarette smoking among urban women aged 14-30 years. The sample (n=712) were all smokers. The questionnaire was open-ended and contained 40 questions related to characteristics of smokers, reasons for smoking, influencing factors and perceptions.

In the Indian context, tobacco use implies the use of tobacco in any form of chewing or smoking. Prevalence of smoking habits or prevalence of chewing habits differs in various parts of India. Different types of smoking habits, such as bidi and chutta, and chewing habits, such as khaini, mawa and betel quid, differ more in different parts of the country. In general, men smoke as well as chew tobacco whereas women generally only chew tobacco with the exception of a few areas where prevalence of smoking among women is high. In the coastal areas of Andhra Pradesh and Orissa, women

FIGURE 1: NUMBER OF CIGARETTES SMOKED PER DAY PER SMOKER



Source: (5)

TABLE 5: NUMBER OF CIGARETTES SMOKED PER SMOKER PER DAY BY GENDER

	MEN	WOMEN
Australia	21.3	19.7
Austria	19.2	15.7
Bahamas	14.0	12.0
Belgium	17.6	15.1
Canada	24.6	21.6
Denmark	12.8	11.3
Finland	15.4	12.9
France	14.2	11.2
Germany	19.5	17.8
Hong Kong	14.1	14.1
Ireland	20.9	20.9
Italy	15.1	15.1
Israel	21.0	15.0
Japan	24.9	21.6
Netherlands	15.7	13.7
New Zealand	17.4	16.0
Norway	11.7	10.3
Portugal	20.8	17.8
Singapore	18.7	18.7
South Korea	24.8	24.8
Spain	12.5	12.5
Sweden	15.3	14.3
Switzerland	22.1	19.6
UK	18.4	16.9
USA	24.3	22.5

Source:(5)

smoke cheroot (cigars also called chutta) in a reverse manner (i.e., with the burning end inside the mouth), and in some northern parts of India, women often smoke hookah or hubble bubble.

The prevalence of tobacco use in India is not available from any nationwide survey. However, several population-based survey results from different part of India from late 1970s are available and all show prevalence of tobacco use to be high ranging from 33-80 percent among men and 15-67 percent among women. Given the high prevalence and manner in which it is consumed, tobacco use is a serious health problem, exerting a high degree of morbidity and mortality in India. It has been estimated that 40 percent of deaths among men and 4 percent of deaths among women are related to tobacco use (10). Oral cancers caused by chewing tobacco account for about 50-70 percent of all cancers.

The tobacco profile of women in rural India is varied. In general, women tobacco users in rural India are housewives or farmers working in the fields where literacy levels are low. The main reasons for initiation of

tobacco use in various forms were: accepted norms, beliefs and use as a medicinal aid (to cure toothaches, during labor). The reason cited for maintenance was dependence. For example, women in Kerala chew tobacco with betel leaf and areca nut. These women are full-time housewives and also work in the field, growing, tending and harvesting paddy. The literacy rate in Kerala is higher than in most parts of India; in addition, the women are independent, have their private supplies of chewing tobacco and indulge in the habit whenever they want. Their counterparts in Andhra Pradesh are less literate and poorer, and if they do not chew tobacco, they still smoke the chutta.

Interesting data also exist for Singapore. A recent national survey has shown that since the start of the National Smoking Control Programme in 1986, there has been an overall decrease in smoking prevalence from 20% (37% males and 3% females) in 1984 to 15% (26.9% males and 3.1% females) in 1998. Of concern is the increase in smoking among young women aged 18-24 years. The smoking prevalence among women aged 18-24 years has increased from 0.8% in 1984 to 2.8% in 1992 and 5.9% in 1998, as seen in Table 6 (11).

TABLE 6: PREVALENCE OF DAILY SMOKING AMONG AGE GROUPS IN SINGAPORE BY GENDER, 1998

	MALE (%)		FEMALE (%)		TOTAL(%)	
Age (years)	1992	1998	1992	1998	1992	1998
18-24	29.0	25.5	2.8	5.9	16.1	15.8
25-44	35.2	27.2	2.4	2.6	19.0	15.0
45-64	31.5	27.0	4.7	2.5	18.1	14.8
18-64	33.2	26.9	3.0	3.1	18.3	15.0

Source:(11).

The reasons young women started smoking did not appear to differ from the reasons given by young men: curiosity, peer pressure, the need to relieve stress, desire to impress friends and to relieve boredom. It was observed that changing social values, increase in income, confidence and perceived stress levels among women seemed to have contributed to the increase in young women smokers in Singapore. Women's financial independence and increase in self-confidence seem to have enabled those who smoke to defy or disregard the social disapproval of women smoking that has long helped to keep the smoking prevalence among women low in Singapore.

Social and environmental factors such as the influence of family, peers and loved ones were the key factors that promote or discourage smoking. Providing a supportive environment such as expanding the laws to cover more public areas like pubs and discotheques can help to limit the places and times available for smokers to smoke. This will make smoking inconvenient and encourage people to stay smoke-free. There is also a need to correct the common misconception that smoking helps to relieve stress. Stress was cited many times as an important factor in initiating and continuing smoking as well as returning to smoking among those who have given up.

INITIATION OF TOBACCO USE

Tobacco use primarily begins in early adolescence, typically by age 16, with almost all first use occurring before the time of high school graduation (age 18) (3). Although some try their first cigarette as children, the majority of smokers start smoking in their teens, and most girls experiment with cigarettes around the age of 10-14 years. In most countries, few people start smoking after the age of 18-21 years; however, in some countries such as China, prevalence is low during adolescence and increases during early adulthood (12). In India, however, 50 percent of those who use smokeless tobacco tend to start before age 10 and 80 percent before age 20 (13). It has been observed that many factors affect initiation of tobacco use. These factors seem to differ between the developed and developing countries and also among various groups within a country. It is suggested that the development of tobacco use is influenced by a complex interplay of positive and negative factors, which diminish and increase in importance at different stages. The process of initiation is linked to environmental and personal factors.

As in most areas of behavioral sciences, the bulk of research on tobacco use has focused on the behavior of individual smokers. However, tobacco prevention researchers have begun to examine the larger social system's role in promoting or discouraging tobacco use. Factors in the environment that potentially influence initiation of tobacco use among adolescents include 1) sociodemographic, 2) sociocultural factors and 3) socioeconomic factors.

Sociodemographic Factors

Sociodemographic factors may include age, gender, ethnicity and acculturation, family size and structure and parental socioeconomic status. In some studies, it is often difficult to separate these factors because they interrelate and overlap. Initiation and prevalence of tobacco use among adolescents typically rise with increasing age and grade (14,15). Adolescents who

began smoking at a younger age were more likely to become regular smokers (16) and less likely to quit smoking (17).

Reports of equal or higher levels of smoking by females were primarily found in studies from countries with a Western cultural orientation such as England, New Zealand and the United States (14,18-23), rather than an Eastern one with higher smoking levels among males as is the case in China, Japan, Sri Lanka and India (13,24-27). Also consistent with this pattern of east/west differences was a report from the United States of a significantly higher risk of current smoking among Vietnamese boys than girls, whereas the risk was lower among white and Hispanic boys than among girls of these same ethnic/racial groups (28).

It is well documented that U.S. blacks show significantly lower levels of initiation and current smoking than whites or Hispanics (29-31). The reasons for these differences are not clear, particularly given that many of the variables associated with tobacco use, such as low SES, poverty, dysfunctional families and low educational aspirations tend to cluster in some "black" geographical areas. Among blacks who do smoke, the mechanisms may be different from those for whites; smoking may serve more of a social function for white adolescents because they are more strongly influenced by peer smoking (32).

In most industrialized countries, women who smoke tend to consume fewer cigarettes than men do; prefer filter-tipped, low-tar and low-nicotine brands; do not smoke roll-your-own cigarettes; inhale less deeply; and leave more of the cigarette unsmoked than men do (33). Because smoking-related diseases are quantitatively related to the dose of cigarette smoke measured in terms of packs of cigarettes per day, this further reduces the overall risk of smoking-related diseases in women. In addition, women tend to inhale less of the cigarette smoke and are more likely to smoke filtered cigarettes and low-yield (low-tar) cigarettes, which are associated with smaller reductions in risk for a few diseases caused by smoking (34).

Studies related to family structure often concluded that intact, two-parent families are protective against smoking (35-38). The effect of household size on risk of tobacco use is unclear: studies have noted larger families to be associated with both lower (39,40) or higher levels of tobacco use (35), or have reported no significant relationship (23). Higher levels of parental and socioeconomic variables, such as education and social class, have been inversely related to tobacco use among adolescents in some studies (41,42).

Sociocultural Factors

Sociocultural factors that influence initiation and maintenance of tobacco use by adolescents demonstrate the importance of parental and peer tobacco use as risk factors.

Parental Influence. The impact of parental smoking has been studied in a wide range of contexts in a large number of studies with a variety of outcomes. Some studies of the association between parent smoking and adolescent smoking have sometimes found significant relationships (43) and some have not (44). Bauman and colleagues (45) found that smoking among adolescents is more strongly related to whether a parent has ever smoked than to whether a parent currently smokes. The strength of the relationship between whether a parent has ever smoked and children's smoking was as strong as the relationship between adolescent smoking and their friend's smoking. This finding suggests that parental influences on children's smoking are more likely attributable to other processes than to modeling. Bauman et al. (45) suggest that parents who have smoked in their lifetime are more likely to express opposition clearly and explicitly to their children smoking than are parents who have never smoked. Bauman et al. (45) cite a study by Krohn and colleagues (46), showing that parents who do not clearly oppose their children's smoking will not influence their children to remain nonsmokers; a neutral position is not enough.

The impact of parental smoking patterns has been observed in elementary school students. First graders whose parents smoke perceive it as an acceptable habit more often than do children whose parents do not smoke (47). In families in which both parents'smoke, 15.1 percent of female adolescents are smokers compared to 6.5 percent when neither parent smokes (48). Further, female youths are more likely to smoke when their mother smokes (49-51).

Studies that have compared associations between peer and adolescent smoking and between parent and adolescent smoking have generally found that peer smoking predicts adolescent smoking better that parental smoking (52). Given this evidence, one might conclude that parental smoking can influence young people to take up smoking, but that adolescents are more likely to be influenced by their friends'behavior. Of course, even if parental smoking is associated with adolescent smoking, this relationship could be interpreted in a variety of

ways. The most straightforward interpretation is that parents who smoke serve as models for the behavior of their children. However, parental smoking could affect youthful smokers in many ways. For example, being raised in a home where parents smoke exposes a young person to a good deal of cigarette smoke; such exposure may accustom the young person to the presence of smoke. Parents who smoke may also facilitate their children's smoking simply by giving children easier access to cigarettes. Finally, parents who smoke may be less likely to oppose their children's smoking, once peer influence prompts children to experiment.

Numerous studies have shown that the single most direct influence on smoking among adolescents is how many of their five best friends smoke.

Some evidence indicates that teenagers are more likely to smoke if their older siblings smoke (53). This relationship has been harder to study, because fewer adolescents have older siblings than have friends or parents. Presumably, the relationship occurs partly because older siblings model, prompt and reinforce smoking behavior with their younger siblings. Households containing older siblings who smoke may also be those where parents do not clearly oppose youth smoking. Even if relationships between parents'current smoking or lifetime smoking status and their children's smoking are weak, parents may still play a role in preventing their children from becoming smokers. The above findings only reveal the influences of existing parental practices.

Peer influence. 'Peers'have been variously defined as classmates, friends, best friends, opposite or same-sex friends, and boyfriends or girlfriends (54). Regardless of the definition used, however, peer tobacco use is consistently related to adolescent tobacco use initiation, maintenance and intentions (14,55-57). The onset of smoking has been related to having a close friend who smokes (58-60). Female adolescents with a best friend who smokes are nine times more likely to be smokers (61). In fact, smoking is usually a shared activity with important socializing functions for female youth (62,63). Although it is difficult to determine if female adolescents model their behavior after friends or select peers with similar behavior, studies have reported that same-sex friends are influential in the smoking behavior of female adolescents (50,62,63).

Numerous studies have shown that the single most direct influence on smoking among adolescents is how many of their five best friends smoke (64). To some extent, relationships between peer smoking and smoking onset may occur because an adolescent begins to smoke and then becomes friends with others who smoke (65). However, some evidence from longitudinal studies shows that adolescents who have friends who smoke, but do not yet smoke themselves, are more likely to become smokers in the future than adolescents with nonsmoking friends (44). In addition, interviews with adolescents who have begun smoking indicate that an overwhelming majority of about 80 percent of initial cigarette experimentation episodes occur in the presence of other adolescents who are smoking, and that those who begin experimentation in the presence of peers are more likely to continue smoking (66).

Social influences to smoke appear important even after a young person begins smoking regularly. Adolescents who were asked to self-monitor occasions when they smoked during the course of the week indicated that, in 71 percent of smoking episodes, they were in the presence of another person; 34 percent of episodes occurred in the presence of another teen (67). Peer smoking has been shown to predict continued smoking among young people who have already begun to smoke (44). Presumably, adolescents who begin and continue to smoke receive social reinforcement from peers. No studies provide direct observation of these contingencies. Explicit peer approval may not be the reinforcer for initial smoking. Rather, smoking may be socially reinforced simply because, in some social groups, smoking is associated with reinforcing interactions with peers.

Advertising and Promotion. Tobacco companies deny marketing cigarettes to young people. However, a great deal of evidence indicates that tobacco companies are hard at work to recruit young people to smoke. To begin with, tobacco companies have to recruit about 4,000 new smokers daily just to maintain their current market size. About, 1,100 smokers die every day from smoking related illnesses, and more than 3,000 quit (68). Yet, few people begin after the age of 20 (69). Thus, recruiting young people to smoke is vital to profit maintenance. Marketing to young people is not just a matter of ensuring future sales. Sales to those who are currently under age 18 is a significant source of profit for the tobacco companies. DiFranza and Tye (70) have estimated that between USD $900 million and USD $1.54 billion worth of cigarettes are sold annually to people under age 18 (and virtually all these sales are illegal). This topic is discussed in the chapter *The*

Marketing of Tobacco to Women: Global Perspectives by Nancy J. Kaufman and Mimi Nichter.

Socioeconomic Factors

Socioeconomic status has been implicated in the onset of cigarette use among adolescents (71). Teenagers from lower socioeconomic backgrounds are more likely to smoke than are middle-class counterparts (72). Similar class differences emerge with pregnant smokers (73). Middle-class pregnant adolescents are more likely to reduce or to quit smoking during pregnancy than are those in the lower class (74). This difference in smoking patterns may reflect divergent beliefs and attitudes about tobacco use based on socioeconomic status (73). Moreover, cigarette advertising has influenced low-income youth beliefs and attitudes about tobacco use. Such advertising associates cigarette smoking with financial success and may be an attraction (62,75). In contrast, a study of school children in Bombay, India (76) showed that children from higher income groups attending private English schools have a high smoking prevalence rate compared to the children attending municipal Indian-language schools. This elucidates that children from higher socioeconomic groups are more likely to use tobacco compared to their middle class counterparts.

Studies have found an association between personal income of adolescents with adolescent tobacco use; young people with more spending money showed higher levels of tobacco use (21,23,77,78), because money is needed to purchase tobacco products. For many young girls, the initiation of smoking corresponds to a rise in disposable income. It has been shown, in a few countries, that teenagers may be even more sensitive than adults to the relative price of cigarettes and that the price affects not only whether teenagers smoke, but also how much they smoke. Thus, a rise in the price of tobacco products can influence the level of consumption.This subject is dealt with in detail in the chapter *Economic Policies, Taxation and Fiscal Measures* by Rowena Jacobs.

Personal Factors

Personal factors that have consistently been associated with tobacco use are knowledge, attitudes and beliefs; self-esteem; self-image; and locus of control.

Knowledge, attitudes and beliefs. Some studies have found knowledge about the detrimental health effects of tobacco use to be preventive (19,79), but the bulk of the literature does not support this position (14,18,80). In developed countries, studies have shown that adolescents who smoke are usually less knowledgeable about health risks involved, do not believe that smoking will affect them personally or consider that the short-term benefits outweigh any health risks. However, knowledge alone is not sufficient to prevent smoking among adolescents, since many misinterpret the risks involved. In developing countries, young girls'knowledge about smoking and its effects on health is likely to be much lower because of cultural beliefs and lack of systematic health education programs. People's knowledge of the health risks of smoking appears to be partial at best, especially in low- and middle-income countries where information about these hazards is limited. In China, for example, 61 percent of adult smokers surveyed in 1996 believed that cigarettes did them "little or no harm" (6).

In the high-income countries, general awareness of the health effects of smoking has undoubtedly increased over the past four decades. However, there has been much more controversy about how accurately smokers in high-income countries perceive the risks of developing disease. Various studies conducted over the past two decades have produced mixed conclusions. Some find that people overstate these risks; others find that the risks are underestimated; and still others find that risk perceptions are adequate. The methodologies employed in these studies, however, have been criticized on multiple grounds. An overview of the research literature recently concluded that smokers in high-income countries are generally aware of their increased risk of disease, but that they judge the size of these risks to be smaller and less well established than do nonsmokers. Moreover, even where individuals have a reasonably accurate perception of the health risks faced by smokers as a group, they minimize the personal relevance of this information, believing other smokers'risks to be greater than their own (6).

Evidence from various countries shows that smokers may have a distorted perception of the health risks of smoking compared with other health risks. Most smoking starts early in life, and children and teenagers may know less about health effects of smoking than do adults. Young people underestimate the risk of becoming addicted to nicotine, and therefore grossly underestimate the future costs from tobacco use. Even teenagers who have been told about the risks of tobacco use may have a limited capacity to use the information wisely.

Positive attitudes towards tobacco use and tobacco users tend to be related to an increased likelihood of tobacco use (57, 81, 82). Charlton and Blair (83) found

the relationship between positive attitudes to smoking and initiation of smoking to be significant only for females. Beliefs about smoking have also predicted the onset of smoking (84,85). These studies have reported that adolescent smokers demonstrate less knowledge about the negative consequences of smoking, discount the addictive property of tobacco and negate the risks of experimental smoking as compared to their nonsmoking counterparts. Although most female teenagers believe that long-term smoking is a health hazard, their own smoking is believed to be unrelated to the chronic smoking habits of adults (61,86). Hansen (87) in a cross-cultural study of beliefs related to smoking among three ethnic groups of females (African-American, Puerto Rican and non-Hispanic white) found that perceived social pressure and specific beliefs regarding smoking differed by ethnicity.

In a study on low-income pregnant adolescents, it was found that they believed that cigarette smoking decreases the pain and length of labor. This suggests that this belief served as an incentive for youth to smoke (88). Such enticement may be particularly significant for pregnant adolescents who fear losing control during childbirth. Because they viewed their inability to perform adequately during labor and delivery as a personal failure, they smoked to control childbirth pain through the delivery of a smaller infant. In fact, few studies have explored this use of tobacco by low-income pregnant youth (89,90).

Self-esteem. The process of individuation and identity formation is inherent to adolescence. The adolescent's sense of self evolves as she or he interacts with parents, school and peers and considers options for the future. Self-esteem, or an individual's qualitative self-evaluation, emerges from these contexts (91). Self-esteem has been implicated in tobacco use among adolescents (60,92,93). Adolescents who smoke have been identified as possessing low self-esteem and low expectations for future achievement (60). In fact, they may regard smoking as a means of coping with stress, anxiety and depression associated with lack of self-confidence.

Compared to male adolescents, females cope by "worrying" and then smoke in response to the negative affects of "worry" (71). Young and Werch (91) also found that young nonsmokers and those with no intention of smoking in the future had higher self-esteem relative to family, school and peers than frequent users or those who intended to use in the future. Although various postulations have been offered as to why female adolescents smoke, little attention has been paid to the expected benefits of smoking (90). In fact, youth may be duped into believing that tobacco use has positive benefits that outweigh its long-term health consequences (94). This suggests the need to explore the beliefs of teenagers concerning the benefits that they gain from smoking (90).

Self-image. Some adolescents may smoke cigarettes to enhance their lower self-esteem by improving their external image, i.e., by appearing mature or "cool." Role models who smoke are frequently seen as tough, sociable and sexually attractive (95). Adolescents who believe that smoking bestows these attributes may see smoking as a powerful mechanism for self-enhancement. These young people may experiment with smoking to try to adopt a perceived positive social image and thereby improve the way others, particularly peers, view them (95). If peers respond favorably to this strategy, these new young smokers may continue to smoke, since the behavior has proved functional for them in creating an acceptable self-image.

Smoking is portrayed in advertising as a means of attaining maturity, adulthood, and of being sophisticated, sociable, feminine and sexually attractive. In developed countries, where the media promote an image of female attractiveness that equates being thin with desirability, evidence shows that weight control and dieting are major obsessions among adolescent girls. For these girls, being slim gives them self-confidence and is fashionable. In a sample of low-income pregnant adolescents, smoking served as an appetite suppressant to cope with weight gain. Similar to other women, the respondents desired to be thin and accepted the cultural standards of ideal body weight. This view of physical appearance made it difficult for them to feel attractive if they did not meet the norm of slenderness (88). As promoted in advertising, the ideal women is tall and weighs 10 to 15 pounds less than what is feasible for only one percent of the population (96).

MAINTENANCE OF TOBACCO USE

As with initiation, women continue to smoke because of a complex interplay of individual and psychosocial factors. Continued smoking is often the result of a women's physiological addiction to nicotine and psychological and social factors.

Physiological Factors

Dependence. The 1988 Surgeon General's report on smoking concluded that cigarette and other forms of tobacco use are addictive and that nicotine is the drug

in tobacco that leads to addiction (97). A substance is said to be addictive if discontinuation of its use produces cravings and other withdrawal reactions, if a period of deprivation of the substance produces higher than usual compensatory consumption, and if consummatory behavior functions to regulate blood levels of the substance (97, 98). Cigarette smoking and other forms of tobacco use meet all these criteria. Smokers who are deprived of cigarettes experience diverse unpleasant sensations, including headaches, irritability and anxiety (99). They tend to compensate for periods of deprivation by increasing consumption when cigarettes become available, and such compensatory activity regulates the nicotine level in their bloodstream (97). Evidence indicates that smokeless tobacco use produces the same effects (100). Nicotine's dependence-producing properties are responsible for its reinforcing effects. Once a person has begun to use tobacco habitually, his attempts to stop produce symptoms of withdrawal. The aversive events can be reduced or terminated by resuming smoking or chewing tobacco. Termination of these events constitutes negative reinforcement. A tobacco user experiences numerous trials each day when the aversive effects of nicotine withdrawal are terminated by consuming tobacco. A person who tries to quit but fails experiences longer and more substantial aversive events, which are then reinforced by giving in to the urges. In unsuccessful efforts to quit, most tobacco users inadvertently shape powerful aversive reactions to nicotine withdrawal (101).

Symptoms associated with nicotine withdrawal include nausea, headache, constipation, diarrhea, increased appetite, drowsiness, fatigue, insomnia, inability to concentrate, irritability, hostility, anxiety and craving for tobacco (102,103). In its Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM IV), the American Psychiatric Association (APA) recognized nicotine dependence as a mental disorder due to psychoactive substance abuse (104).

Study results also differ on whether nicotine affects women and men differently (105). Some investigators reported fewer gender-specific differences in the subjective, behavioral, or psychological effects of nicotine (106). Others reported that, depending on the nicotine effect examined (e.g., dose-related withdrawal response or weight gain), women exhibit either less or greater sensitivity to nicotine than men do. Silverstein and coworkers (107) suggested that, because women are more likely to report feeling sick after smoking their very first cigarette, they might be more sensitive to nicotine than men are. Some researchers have attributed this increased sensitivity to women's smaller size, higher percentage of body fat, and slower clearance of nicotine from the body (108-110). Others have concluded that any gender-specific differences in the physiologic response to nicotine have a minor influence on differences in smoking behavior of women and men (111), or they have attributed a difference in the effect of nicotine to gender-specific differences in smoking patterns (112). Janet Brigham, in the chapter *The Addiction Model*, has dealt with this topic in detail.

Psychosocial Factors

Stress. Research shows that women often smoke in response to negative life experiences. Often, these experiences are indicative of the lower status and role women hold in society. Although men and women may smoke to reduce stress, they experience different stresses in their lives. For example, in recent years, women have entered the workforce in large numbers, but these women still shoulder the majority of child, elder and household responsibilities. These multiple workloads may contribute to women's smoking. Women in the workforce often hold lower-level service or manufacturing jobs, which provide little sense of autonomy or control. Both of these factors have been shown to increase stress. Women who hold jobs filled with routine or repetitive tasks often view a "smoking break" as a welcome rest from the routine. Similarly, women caring for children may view cigarettes as a means to gain some "space" or personal time. Women also smoke to control their emotions, particularly to suppress anger. In general, it is not acceptable for women to display excessive anger and hostility or physical violence.

Women use smoking to temper these emotions and to better fit the societal norm. Traditionally, American culture praises and rewards women for their beauty, currently defined for most women as youthful and thin. Unfortunately, many women strive for the cultural ideal, regardless of the cost to their health. Women more often than men use smoking as a mechanism to attain and maintain ideal body weight. The factors that contribute to women's maintenance of smoking are indicative of women's lower status in society and the inequality women often face. Despite significant gains, it is men who hold the lion's share of economic, social and political power. The often-unequal treatment of women in society must be considered when planning interventions to impact upon women's smoking.

Depression. The prevalence of cigarette smoking has been found to be higher for persons having psychiatric

disorders, such as schizophrenia, mania, personality disorders (99), depression (113-118) and panic disorders (116,118). The causal direction of these associations is unclear. Depressed smokers are also less likely to quit smoking (114,115). Smokers with a history of depression have a greater risk of relapse after a cessation attempt (119). It has been reported that smoking cessation causes more intense depressed mood in smokers with a history of depression and that these symptoms were related to lower success rates for cessation (36). The prevalence of depression among women is twice that among men (104,120), indicating that these associations may be particularly important for women. In a longitudinal study, Kandel and Davies (65) reported that depressed adolescents were more likely than nondepressed adolescents to report daily smoking nine years later. Other data have shown an association between heavy smoking and depression among adolescents (36).

Body weight. Body weight is one of the issues related to women and smoking. Several studies of adolescents and adults found relationships between smoking and body image, body weight and dieting behavior (97,120-126). Among cigarette smokers, significant numbers of young women report the use of cigarettes for weight management (127, 128). Women's concerns about weight may encourage smoking initiation, be a barrier to smoking cessation, and increase relapse rates among women who stop smoking (15, 126, 127,129-136).

A survey of high school students indicated that nearly 40 percent of female cigarette smokers surveyed endorsed smoking as a method to control their appetite and weight, versus only 12 percent of male smokers (15). Female weight-control smokers report higher dietary restraint (128) and more eating-disorder symptoms (126), suggesting a greater tendency toward chronic dieting and restrained eating behavior. In addition, restrained eaters endorse the use of smoking for weight-control purposes significantly more than do unrestrained eaters (136).

Much research has also investigated the relationship between smoking cessation and weight gain, specifically whether fear of gaining weight discourages attempts to quit (126,137-140). This research suggests that concerns about weight gain often hinder smoking cessation, especially among women (128,129), although some results have not supported this finding (126). Additionally, women tend to gain more weight than men do after quitting. Williamson et al. (140) estimated the adjusted weight gain attributable to smoking cessation to be 3.8 kg for women and 2.8 kg for men.

Because women may initiate smoking in order to lose or maintain weight and continue to smoke in fear of weight gain, weight control may represent an important motivational factor in cigarette use among women. A study by Gerend et al. (141) showed a minority of women indicated the use of smokeless tobacco for weight management, but its use for this reason may not be a predominant mediator as with cigarette smoking.

COMPREHENSIVE TOBACCO CONTROL STRATEGIES

This section will explore the multifaceted components of comprehensive tobacco control, such as: 1) education and information, 2) legislative and regulatory measure and 3) community interventions. Ideally, these components should be developed in conjunction with social, economic, environmental and welfare policies. The key to success of any public health strategy depends upon political commitment, the role of international agencies, and management and surveillance of evaluation systems.

Education and Information

Comprehensive school health programs target multiple health risk factors, including tobacco, and combine education with public policy approaches. School-based tobacco use prevention programs that teach skills to resist social influences to tobacco use can be successful if reinforced throughout the primary and secondary school years (142). School anti-smoking programs are widespread, particularly in high-income countries. However, they appear to be less effective than many other types of information dissemination.

Legislative and Regulatory Measures

Health warning labels. The purpose of warning labels is to influence tobacco use behavior by providing additional information to support the motivation not to start smoking or to quit. However, one key weakness of warning labels is that they will not reach some poorer individuals in some developing countries. By 1991, 77 countries required warning labels on tobacco products. Very few countries have strong warnings with rotating messages. Often the reality is that labeling in most countries did not influence tobacco use behavior, because the health warnings were weak and hardly visible. Moreover, these weak warning labels have only been an advantage for the tobacco industry, as they were a perfect legal protection in the product liability lawsuits.

Advertising and promotion bans. Tobacco advertising and promotion activities appear both to stimulate adult consumption and to increase the risk of youth ini-

tiation (142). Children buy the most heavily advertised brands and are three times more affected by advertising than are adults (143). Studies have shown that children are aware of and are influenced by tobacco advertising (143). The issue of advertising and smoking initiation is dealt with in depth in the chapter *The Marketing of Tobacco to Women: Global Perspectives* by Nancy J. Kaufman and Mimi Nichter.

Since 1972, most high-income countries have introduced stronger restrictions across more media and on various forms of sponsorship. A study of 100 countries compared consumption trends over time in those with relatively complete bans on advertising and promotion and those with no such bans. In the countries with nearly complete bans, the downward trend in consumption was found to be much steeper (6).

Youth access laws. Youth access laws limit the supply of tobacco products to youth too young to comprehend the risks of consuming tobacco products. Youth access laws are designed to limit the availability of tobacco to minors from commercial sources (grocery stores, pharmacy, vending machines, samples from distributors). The rationale for governments enacting youth access restrictions rests primarily on the fact that minors should be protected from the inherent dangers of tobacco since they do not know how to access or accurately appreciate the risks of becoming addicted to nicotine (142). In general, youth restrictions are difficult to enforce, because youth often obtain cigarettes from their older peers and sometimes from their parents. Several attempts to impose restrictions on the sale of cigarettes to teenagers in many developed countries have proven unsuccessful. In many developing countries where tobacco consumption is rising, the infrastructure and resources needed to implement and enforce such restrictions are not available compared to the developed countries (144,145).

The literature provides mixed evidence on the effectiveness of youth access laws in reducing youth smoking prevalence. Forster and Wolfson (146) summarize workable policies to restrict youth access to tobacco. Strong youth access intervention programs should enforce one or all of the following means of restricting supply: 1) complete restrictions on distribution, such as bans on free samples and coupons; 2) regulation of the means of sale through bans or locks on vending machines, placement of tobacco products behind service counters to limit self-service, and prohibitions on single/loose cigarettes; and 3) regulation of the seller through tobacco product licensing requirements that include possible revocation and the passage of minimum age-at-sale laws where violation results in stiff penalties and fines.

Young people use commercial and social sources to acquire tobacco products. Common commercial sources include convenience stores, gas stations and vending machines. Social sources of tobacco include adults (parents, guardians, other adults), peers and strangers. Youth access laws are designed to limit the availability of tobacco to minors from commercial sources (grocery store, pharmacy, convenience store, vending machine and free samples from distributors). Controlling social sources of tobacco is more difficult (146). The literature provides mixed evidence on the effectiveness of youth access laws in reducing youth smoking prevalence (147,148).

As youth access to commercial sources of tobacco becomes more limited, non-commercial (social) sources of tobacco (other adolescents, parents, older friends and strangers) will become more prevalent and pose greater intervention challenges (146,149). Research shows that as adolescents age, they transition from social to commercial sources of tobacco. Older adolescents are more likely than their younger peers to purchase tobacco products from commercial sources and older adolescents are willing to share tobacco products with their younger peers (149). Other strategies to address the social availability of tobacco products must also be developed to close all avenues for product acquisition to under-age youth.

Clean indoor air policies. Clean indoor air policies in public places are important because they protect non-smokers from exposure to health risks of environmental tobacco smoke and reduces smokers'consumption of cigarettes and induce some to quit. Many countries are implementing restrictions on smoking in public places such as public buildings, restaurants, schools, daycare centers and transport facilities. This issue is described in detail in the chapter *Passive Smoking, Women and Children* by Jonathan Samet and Gonghuan Yang.

Clean indoor-air policies alter young adult tobacco use behavior. Chaloupka and Wechsler (150) found that relatively strong restrictions on smoking in public places discourage college students from smoking. Using data from the 1993 Harvard College Alcohol Study, which sampled 17,592 students at 140 US four-year colleges and universities, the authors found that state and local laws limiting smoking in restaurants and schools was significantly associated with lower smoking participa-

tion rates among college students. Additionally, they found that some restrictions on public smoking lead to further reductions in smoking by lowering average cigarette consumption among smokers (145).

Limits on harmful substances in tobacco. A ceiling of about 10-15 mg of tar is recommended (151), below which smokers compensate by smoking more cigarettes, drawing more often on each cigarette, inhaling more deeply and smoking further down each butt. There is growing evidence that low tar and light cigarettes are not less carcinogenic, but mislead consumers and reassure smokers with the false belief that light cigarettes offer some protection.

Tax increases. Evidence from several countries shows that price increases on cigarettes are highly effective in reducing demand. Higher taxes induce some smokers to quit and prevent others from starting. They also reduce the number of ex-smokers who return to cigarettes and reduce consumption among continuing smokers. On average, a price rise of 10 percent on a pack of cigarettes would be expected to reduce demand for cigarettes by about 4 percent in high-income countries and by about 8 percent in low- and middle-income countries. Children and adolescents are more responsive to price rises than older adults, so this intervention would have a significant impact on them. Models show that tax increases that raise the real price of cigarettes by 10 percent worldwide would cause 40 million smokers alive in 1995 to quit and would prevent a minimum of 10 million tobacco-related deaths. Currently, in high-income countries, taxes average about two-thirds or more of the retail price of a pack of cigarettes. In lower-income countries taxes amount to no more than half the retail price of a pack of cigarettes (6). This subject is described in the chapter *Economic Policies, Taxation and Fiscal Measures* by Rowena Jacobs.

Surveillance and evaluation. Surveillance and evaluation programs, which monitor the changing patterns of the tobacco use and program effectiveness, are essential for effective tobacco use prevention and control programs. Tobacco surveillance in most countries is not a priority, because of reasons ranging from a lack of resources to underestimation of its need and importance. It has been observed that events in one country can quickly have consequences in others, and no single country or region can undertake establishing a surveillance system in isolation. As a function, surveillance requires collaboration on systems and standards for information that will transform data into "intelligence." This is critical to the success of global tobacco control strategies.

RECOMMENDATIONS

- In developing tobacco control strategies, incorporate the changing cultural, psychosocial and environmental factors that influence initiation and maintenance of tobacco use among girls and women.
- Monitor patterns of tobacco use specific to girls and women.
- Develop culturally sensitive and gender-specific community programs to prevent initiation and maintenance of tobacco use.
- Recognize the central role of women in increasing tobacco consumption particularly in developing countries and create appropriate strategies to reverse this rising trend.
- Encourage involvement of national and international agencies in development and support of programs and policies specifically designed to decrease tobacco use among girls and women.
- Study the plans of the industry's opening up of the market in developing countries and develop appropriate timely strategies to counter the expansion.
- Develop and implement educational programs relevant to rural women.
- Recognize that further research is needed to identify profiles of female tobacco users to develop appropriate prevention and intervention programs.
- Monitor tobacco use and the effectiveness of tobacco control programs through the surveillance and evaluation system.
- Network with other developing countries that are experiencing similar situations and identify effective common regional strategies that can be useful nationally and globally.

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The Marketing of Tobacco To Women: Global Perspectives

Nancy J. Kaufman and Mimi Nichter

...Women smokers are likely to increase as a percentage of the total. Women are adopting more dominant roles in society: they have increased spending power, they live longer than men. And as a recent official report showed, they seem to be less influenced by the anti-smoking campaigns than their male counterparts. All in all, that makes women a prime target. So, despite previous hesitancy, might we now expect to see a more defined attack on the important market segment represented by female smokers?
Tobacco Reporter, 1982 (1)

Selling tobacco products to women currently represents the single largest product marketing opportunity in the world. While marketing tobacco to women in the developing world is a relatively recent phenomenon, the industry benefits from 80 years of experience in enticing women in the developed countries to smoke. Themes of body image, fashion, and independence resound in marketing strategies and popular media. The tactics used in marketing tobacco in the United States and other developed nations now threaten women in the developing world.

This paper reviews the history of the marketing of tobacco to women in the United States, describes current US and Asian marketing strategies, outlines the changing roles of women in the Asia region as reflected in marketing, reviews research on how marketing affects tobacco use and makes recommendations for action.

MARKETING TOBACCO TO WOMEN IN THE UNITED STATES

The rich history of the tobacco industry's targeted marketing to women in the United States provides insight into current and future industry marketing tactics in other parts of the world. At the onset, the industry faced formidable odds. At the beginning of this century, few women smoked. Those who did were labeled defiant or emancipated. The Lorillard Company first used images of women smoking in its 1919 ads to promote the Murad and Helman brands, but public outcry ensued. In 1926, Chesterfield entered the women's market with billboards showing a woman asking a male smoker to "Blow Some My Way," resulting in a 40 percent increase in sales over 2 years (2).

The links to fashion and slimness soon followed. In 1927, Marlboro premiered its "Mild as May" campaign in the sophisticated fashion magazine *Le Bon Ton*, and in 1928, Lucky Strike launched a campaign to get women to "Reach for a Lucky Instead of a Sweet" (3). These ads featured copy that directly associated smoking with being thin: "Light a Lucky and you'll never miss sweets that make you fat" and "AVOID that future shadow, when tempted. Reach for a Lucky" accompanied by a silhouette of a woman with a grossly exaggerated double chin. Another ad showing a slim woman's body and then an obese woman's shadow said, "Is this you five years from now? When tempted to over-indulge, Reach for a Lucky instead. It's toasted."

Marketing Luckys as a weight reduction product resulted in a sales increase of over 300 percent in the first year and eventually moved the brand rank from third to first (4). Actresses and opera stars were hired to promote Luckys and American Tobacco paid debutantes and models to smoke in public (3). American Tobacco's public relations specialist, Edward Bernays, worked with fashion magazines to feature photographs of ultraslim Paris models wearing the latest fashions. He also convinced the fashion industry to choose green, the color of the Lucky Strike package, as fashion color of the year (5). An American Tobacco executive likened the women's market to "opening a gold mine right in our front yard" (5).

By the end of the 1920s, cigarette ads regularly featured women, with their new "symbols of freedom." Cigarette ads appeared in women's fashion magazines, such as *Vogue, Vanity Fair* and *Harper's Bazaar* (6). The new era of targeted marketing of tobacco to women was under way.

The late 1960s and early 1970s brought further development of women's brands. Philip Morris launched Virginia Slims with the biggest marketing campaign ("You've Come a Long Way, Baby") in company history (7). Its advertising stressed themes of glamour, thinness, and independence. In 1970, Brown & Williamson premiered the fashion cigarette, Flair, while Liggett & Myers introduced Eve.

Since that time, other niche brands have appeared. Yet, women's brands account for only 5-10 percent of the cigarette market (8), with the majority of women smokers (women represent 50 percent market share) smoking gender-neutral brands, such as Marlboro and Camel. To understand how the tobacco industry markets its products to women, it is necessary to look at the components of modern-day marketing and their individual and synchronistic functions.

Components of modern marketing

Tobacco companies market their products to women as a segment of an overall marketing strategy. The women's market is further segmented by specific subgroup characteristics, as this quote from an American tobacco company document reveals:

> *There is significant opportunity to segment the female market on the basis of current values, age, lifestyles and preferred length and circumference of products. This assignment should consider a more contemporary and relevant lifestyle approach targeted toward young adult female smokers (9).*

Modern marketing strives to attach symbolic meaning to specific tobacco brands by carefully manipulating the components of marketing: brand name, packaging, advertising, promotion, sponsorship and placement in popular culture. The purpose of tobacco marketing is to associate its product with psychologic and social needs that the consumer wants to fulfill, some of which emanate from the restructuring of social reality that advertising itself provides. Marketing is more successful when these components work in a synchronized fashion, surrounding the target consumers with stimuli from multiple sources.

Brand name and packaging. Cigarette brands project distinctive self-identities (10). Attraction to a particular brand of cigarettes is affected by its name, logo and package colors because they signal an overall image that cues the attitude of potential customers to the product (11-13). Brands may use these images to attract women to particular features (e.g. "slims" to weight control), or to eliminate negative feelings such as smoking being inappropriate for women (e.g., "Eve") (14). Brand identity may be particularly important to women, because they make 80 percent of the purchasing decisions in the general marketplace (15).

Tobacco has been called the ultimate "badge product," like a name badge that sends a message every time it is seen (16). It is used many times a day, frequently in social settings. Its package design and brand are visible every time it is used, conveying a particular image. This visual image is enough to stimulate purchase of a brand without recalling the name of the brand (17). Packaging affects consumer attitude toward a product and influences brand choice (18, 19). The color and graphics of the package transfer attributes they symbolize to the product within. Blue and white are often used for health products because they send a signal of cleanness and purity (18). Red is a popular color for tobacco packaging because it connotes excitement, passion, strength, wealth, and power (19, 20). Red also aids recall of a product (12, 13).

Other colors frequently used in tobacco packaging send different signals (19, 20):

Blue:	Light:	calm, coolness, insecurity
	Intense:	loyalty, honesty, royalty, restlessness
	Dark:	tranquililty
Green:		coolness, restfulness, nature, cleanliness, youth
Purple:	Light:	femininity, freshness, springtime
	Dark:	wealth, elegance, security
Pink:		femininity, innocence, relaxation
Orange:		warmth, fame, friendliness, security, appetite stimulation

Packaging works most effectively when its symbolic signals (attributes) match the brand's positioning (image created for the target audience) and are carried through in advertising and promotions (18, 19). When these copy and color attributes then appear in advertisements, they act as stimuli to enhance recall and retention of the brand (12).

Advertising. Tobacco advertisements are commercial messages that appear (in countries without restrictions) in print, on radio or television and on outdoor signs. In 1996, the tobacco industry spent $578 million in the United States to advertise cigarettes, 11 percent of total advertising and promotion expenditures (20). Advertising serves several purposes. It builds a brand's image and raises awareness of the brand (17). Advertising preconditions the consumer to buy, formulating the attitudes needed for considering a purchase. An attitude about a brand consists of two parts: a cognitive or logical component that holds beliefs about the benefit of a product and an affective component where emotions energize behavior.

> Brands targeted to women project themes of thinness, style, glamour, sophistication and sexual attractiveness.

Products project a psychologic and social meaning to the consumer who buys them (21). Smokers and potential smokers who identify with the projected images may purchase the brand as a means of "adopting" the behaviors or attributes portrayed in the ads (22). Themes such as glamour, romance, and independence can enhance the buyer's self-image and may affect the consumer's structuring of social reality. When a role, such as smoking, is new to consumers, they may rely on the social meaning of the product portrayed in advertising to guide how it is used. Brand images may appeal to the socially insecure by posing solutions to identity problems (10, 23). Viewing ads that feature attractive models and elegant surroundings may generate pressure to conform to these lifestyles (24).

In addition to attracting new purchasers, advertising is used to reduce fears about smoking and encourage brand loyalty. It works to reduce health fears about smoking by presenting figures on lower nicotine and tar content of particular brands, with the implication that these are better for health. In fact, the industry has aimed low-tar brands at women because their research shows that women are generally more concerned with health issues than men are (25). Positive imagery (e.g. dazzling blue skies and white-capped mountains, models engaged in sporting pursuits) are commonly used in advertised messages. Such advertising also attracts repeat purchasers, reinforcing preferences so that brand switching is less likely (26, 27).

Examples of advertising from 1994 to 1998. Brands targeted to women project themes of thinness, style, glamour, sophistication, sexual attractiveness, social inclusion, athleticism, liberation, freedom and independence. Capri (Brown & Williamson) uses the slogan, "She's gone to Capri and she's not coming back." The ads, set in a romantic island scene, feature thin models in glamorous or romantic poses, usually holding the ultraslim cigarette.

Virginia Slims (Philip Morris) has used various themes. "You've come a long way, baby" often portrays scenes from women's advances in society or shows a woman taking a dominant role with a man. Glamour and business appeal are used to advertise their clothing and calendar promotions. Misty (American Tobacco Company), advertised heavily in women's magazines, used a "slim 'n'sassy's slim price too" copy. Attractive women hold the slim cigarette. Sex-neutral brands, such as Merit (Philip Morris), have featured couples. Marlboro (Philip Morris) has its quintessential Marlboro Man cowboy, who exudes independence, freedom and strength. They also use peaceful outdoor scenes shot in open surroundings. Strong colors such as red and deep blue are used in the ads that encourage one to "Come to Marlboro Country."

Some brands have focused on the product itself, such as Winston's (R. J. Reynolds) ads that proclaim their "No additives, No bull." Carlton (Brown & Williamson) makes the claim that "Carlton is lowest" for reduced tar and nicotine, using blue and white color schemes. Menthol brands such as Kool (Brown & Williamson) and Newport (Lorillard) use blues and greens to signify coolness and healthfulness, often showing activities near water. Discount brands such as Basic (Philip Morris), Doral (R. J. Reynolds), and GPC (Brown & Williamson) frequently appear in women's magazines, touting their reasonable cost and simple features. Basic ads have shown how their product fits in ("Your basic 3-piece suit"). Camel (RJR) was known for the funky cartoon character, Joe Camel, shown as the life of the party in bars ("Joe's Place") or the man-about-town. For a brief period in 1994, R. J. Reynolds introduced Josephine Camel and her female friends, noting that "There's something for everyone at Joe's Place." Joe Camel was withdrawn from Camel ads by RJR in 1997 after years of protest about using a cartoon character to market cigarettes.

Advertising, then, communicates information to influence attitudes and beliefs by presenting factual material or suggestive imagery (28). These attitudes and beliefs

form the basis of consumer action, which takes place when a behavioral prompt, such as a product promotion, stimulates the consumer (29). Advertising builds awareness, attitudes and perceptions over the long term.

Promotions. Promotions aim for more immediate action on the part of the consumer (30). They can be quite varied, including coupons, multiple pack discounts ("Buy two, get one free"), promotional allowances paid to retailers, point-of-sale displays, free samples, value-added promotions offering free merchandise such as lighters or clothing, endorsements, and placement in movies and television. In 1996, tobacco companies spent over $4.2 billion, or 89 percent of total advertising and promotion expenditures, to promote cigarettes (27).

More than 40 percent of the total expenditures went to retailer promotional allowances. Promotional allowances pay retailers for stocking brands and devoting specific shelf space to them. Allowances also pay for cooperative advertising and cover the costs of retail/wholesale sales incentives. Point-of-sale promotions place cigarettes in convenient retail locations, such as at the end of aisles or in displays at the checkout counter.

Promotions are used to convince consumers to try a product, build purchase volume, encourage brand switching, win customer loyalty and enhance corporate image (3,26,28,31). Value-added promotions, which offer extra specialty items, stimulate short-term sales (28). They offer a promotion boost, however, since consumers wear or use the branded clothing or accessories, providing free "walking billboard" promotions for the companies. These items do not carry the health warnings required on advertisements.

Discount coupons may be especially effective for reaching women and young children, because they are more sensitive to lower prices (32). Jurisdictions that increase the revenue tax on tobacco should expect to see the price increase offset somewhat by an increase in discounts, as has been reported in California and Arizona after their tax increases. The tobacco companies create databases when coupons or other promotions are redeemed by mail. These databases provide demographics used in further marketing. They are also used to alert tobacco users to take action when tobacco control policies are being voted upon. A newer promotional strategy, used by Philip Morris, is to offer discounts on non-tobacco items, such as food or drinks, with a tobacco purchase (33). As policies restrict direct tobacco promotions further, there may be a proliferation of this alternative discount strategy.

Virginia Slims, the most successful women's brand, is a master at promotions. For years, Philip Morris has offered a Virginia Slims annual engagement calendar, the *Book of Days*. Its V-wear catalogues offer clothing items such as blouses, coats, scarves and accessories in exchange for proofs of purchase from packs of its cigarettes. Each of the catalogues has a theme (e.g., glamour) that is reflected in the catalogue copy, photographs and print advertising to promote the catalogue. To get the items requires amassing large numbers of proofs of purchase. For example, a black coat lined in raspberry required 325 packs (34), or spending $621, to acquire based on an average per branded pack cost of $1.91 (35). The theme is carried through in stores, where small plastic shopping baskets feature the ad for Virginia Slims, and plastic bags with the VS logo hold purchases. Their Fall 1998 catalogue carried a "Light up the night" theme for its clothing.

Misty Slims, an American Tobacco Company product, has offered clothing, lighters and even a Rand McNally outlet mall-shopping guide. R. J. Reynold's Camel Cash catalogues offer clothing, jewelry, lipstick holders, lighters and other accessories. Philip Morris'Marlboro brand has its Marlboro Country Store catalog and unique promotions such as a spot on the "Marlboro Train" trip or a vacation on the "Marlboro Ranch." Philip Morris spent $200 million on its Marlboro Adventure Team catalogue (31). In addition to fashion, glamour and adventure, tobacco companies use promotions to market independence and liberty themes. Philip Morris once gave away playing cards featuring the Statue of Liberty, and Brown & Williamson sent its loyal customers a crystal Christmas tree ornament, engraved with the Liberty Bell and the Brown & Williamson logo.

Tobacco companies use promotions to target women by carrying through the themes, colors, and packaging from the ads to the promotional items, reinforcing the image of the brand. While the industry also targets men with these strategies, women represent a special interest group for the tobacco industry. The industry advertises and promotes their products for multiple purposes: to create primary demand for new users to try them; to reinforce tobacco benefits and maintain customers; to make the use of tobacco seem normal; to position products in prominent locations; to minimize the risks of use; and to achieve social legitimacy and create good will (36-39).

Sponsorships. Brand or corporate sponsorship of entertainment, sporting events and organizations is the fastest growing form of tobacco marketing. In 1995, tobacco companies spent about $139 million on sports and entertainment sponsorships (40). Sponsorship allows a company to reach a niche market economically and embeds advertising within the event or cause by linking product attributes or images to it. For the cost of a 30-second Super Bowl commercial, a company that sponsors a NASCAR Winston Cup team receives more than 30 hours of television exposure (41).

Sponsorship creates prestige and credibility for tobacco brands. They gain prestige from association with important events (e.g., fine arts performances or art exhibitions). Tobacco sponsorship may blunt criticism of the industry, socially legitimize smoking, create gratitude from recipient organizations, and produce allies or neutral feelings about tobacco industry practices (3,14,42,43). Tobacco companies use sponsorships as a platform for directing other marketing strategies, such as advertising and promotion (41). Sponsorships have long been used to reach women.

Sponsorship of women's tennis is the classic example of such targeting. Women's tennis attributes the independence, assertiveness and success to brands such as Virginia Slims or its British counterpart, Kim (14). From 1973 to 1994, Philip Morris sponsored the Virginia Slims professional tennis tour (40). Television coverage and other media reports of the tournaments helped promote the brand and logo, and cigarette samples were given away at the entrance to matches (3). At a Wimbledon match, Martina Navratilova wore a tennis outfit in the colors of Kim packaging that included the Kim logo (44).

Philip Morris ended its $5 million per year sponsorship of the tour in 1995. They replaced it with a $3 million per year Virginia Slims Legends Tour, intended to reach older women. The tour included a six-site tournament of former tennis greats, such as Billie Jean King, Chris Evert and Martina Navratilova. It also included a concert featuring female singers, such as Barbara Mandrell and Gladys Knight (40, 45).

Links to the fashion industry appear in sponsorships as well. More brand, a product of R. J. Reynolds, sponsored fashion shows in shopping malls that were tied to advertising in fashion magazines (3). They also sponsored the More Fashion Awards for designers in the fashion industry (46). The tobacco industry sponsors family-oriented festivals and fairs that create dependency on tobacco for community cultural groups (38). For example, they support the Hispanic Cinco de Mayo street fairs in many communities with Hispanic organizations. Philip Morris'Marlboro brand sponsored 18 major fairs, including large state fairs, in 1995, spending $850,000 to reach 20 million family members (40). The Newport brand (Lorillard) spent $155,000 to reach more than 15 million attendees at 31 New York city family and children's events in 1996. Events such as family festivals, a July 4th (Independence Day) celebration and even the Sierra Club's Earth Awareness Day accepted these sponsorships (40).

Tobacco companies also support the arts and athletics (38, 40-46). In 1995 alone, Philip Morris spent $1.2 million to sponsor 15 dance companies (e.g., The American Ballet Theatre, The Dance Theatre of Harlem and The Joffrey Ballet) and two dance events (40). Tobacco companies have also sponsored performances of the Alvin Ailey Dance Theatre, a photographic exhibit featuring images of the late civil rights leader, Dr. Martin Luther King, the Vatican Art Exhibit at New York City's Metropolitan Art Museum and the Arts Festival of Atlanta (attended by more than 10 million people). Many of these events target communities with significant numbers of Hispanic and African-American members.

Sponsorship of music concerts and festivals also offers opportunities to promote tobacco brands. The Kool Jazz Festival is a traditional sponsorship event. More recently, rock concerts benefited from tobacco support. For example, as part of their Rockin' Ticketmaster Campaign, Camel (RJR) sponsored discounted tickets to major rock events, advertising the tickets in a two-page pop-out magazine ad that featured Joe Camel handing the reader a pair of tickets. Getting the discounted tickets required sending in 100 proofs of purchase from Camel packs (47). The industry has also offered support to female rock artists with their Virginia Slim's Woman Thing Music tour, prompting one young musician, Leslie Nuchow, to publicly turn down Philip Morris'support (48).

Civic improvement awards targeted at inner-city leaders are sponsored by Brown & Williamson's Kool brand, a menthol cigarette favored by African Americans. Kool Achiever Awards honor five such leaders annually, including a $50,000 donation to a nonprofit, inner-city organization chosen by each honoree (42). Major African-American organizations, such as the National Urban League, the National Association for the Advancement of Colored People and the National

Newspaper Publishers Association participate in the selection process (38).

Tobacco companies also sponsor motorsport racing events, such as the NASCAR Winston Cup stock car and drag races, the Indy Car World Series, and the Marlboro Grand Prix. Additionally, individual cars and drivers receive sponsorships. While many assume that car racing is of primary interest to men, a recent study estimated that children aged 12-17 years make up 14 percent of the audience at these events, and more than 25 percent of those aged 12-17 years watched auto racing on television in 1996 (49). These events reach many more women via exposure on television broadcasts of the racing events. For example, in 1992, more than 350 motorsports broadcasts reached audiences—which included women—that exceeded 915 million (50). Tobacco brands received more than 54 hours of television exposure during these broadcasts, and over 10,000 mentions, having an exposure value of $68 million (Winston, $41 million; Marlboro, $12 million; Camel, $4 million).

NASCAR's own demographic studies (Harris Poll data) estimate that women are 39 percent of their audience (51). Several NASCAR officials describe this trend:

> *We want to continue in our direction of becoming a white-collar sport, where it's mom, dad and the kids sitting around the TV and rooting for their favorite driver on Sunday.*
>
> *Now, racetracks are places you can bring your kids. I wouldn't say that 20 years ago. It's safe, full of families, the drinking has been greatly curtailed and of course it's all over TV (52).*

The sponsorship of motorsport racing events communicates courage, independence, adventure and aggression (37). A vice president of marketing for Phillip Morris stated, "We perceive Formula One and Indy car racing as adding, if you will, a modern-day dimension to the Marlboro Man" (37). Tobacco companies also support newer forms of racing, such as motorcycle and hydroplane boat races.

Sponsorship of women's organizations. Perhaps most insidious is tobacco company support for women's organizations. As part of a long-standing strategy to support groups representing racial/ethnic minorities and women—who strive for acceptance and expanded roles in American society—tobacco companies have supported women's organizations for many years. In 1987, Philip Morris gave more than $2.4 million to more than 180 black, Hispanic and women's groups, while RJR gave $1.9 million (42).

Women's groups that promote women's leadership in business and politics have been a special target, including the National Women's Political Caucus, the Women's Campaign Fund, the Women's Research and Education Institute, the League of Women Voters Education Fund, Women Executives in State Government, the Center for Women Policy Studies, the Center for the American Woman and Politics, the American Association of University Women and the American Federation of Business and Professional Women's Clubs (42,43).

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The National Organization for Women accepted funding from Philip Morris in the past to print its meeting program (3). A conference drawing half of the nation's female state legislators was held by the Center for American Women and Politics at Rutgers University (New Jersey), using funding from Philip Morris and R. J. Reynolds (43). In 1987, they also provided 10-15 percent ($130,000) of the budget of the National Women's Political Caucus (42). A former congresswoman, Patricia Schroeder, a member of the Caucus' advisory board and a prominent spokesperson for women's rights, employed fellows funded by the Women's Research and Education Institute and presented the Caucus'"Good Guy Award" to a vice president of Philip Morris in 1989 (43). Philip Morris sponsored internships for the Center for Women Policy Studies and supported a national directory of women elected officials (42).

Typical of the tobacco industry's support for organizations representing racial/ethnic minorities, they have also supported minority women's groups. For example, they funded the National Coalition of 100 Black Women, the Mexican-American National Women's Association, the US Hispanic Women's Chamber of Commerce and the National Association of Negro Business and Professional Women's Clubs (43). For Hispanic women, Philip Morris funded leadership training programs in New York and gave $150,000 in 1987 to the US Hispanic Chambers of Commerce (42).

Other minority organizations that have benefited from tobacco company support include the National Council of La Raza, the League of United American Citizens, the National Hispanic Scholarship Foundation, the National Association of Hispanic Journalists, the United Negro College Fund, the National Urban League, the National Newspaper Publishers Association, the Black Journalists Hall of Fame and directories of national African-American and Hispanic organizations (42,43,46).

Many of these organizations claim that the tobacco industry supported them and also individuals through hiring and promotion processes when no one else would. The Women's Campaign fund Executive Director noted, "They were there for us when nobody else was. They legitimized corporate giving for women's groups, from my perspective" (43). This support has not come without receiving something in return. As the leading sponsorship-tracking organization in the US states, "Cause marketing is expected to show a return on investment" (41). Sponsorships buy visibility and credibility that may lead to neutral or supportive stances on tobacco industry positions (42, 43, 46). The director of the fellowship program for the Women's Research and Education Institute stated it this way,

> *I simply think it's part of their way to make themselves look better. They know they're perceived negatively by representatives who are concerned with health issues. To tell you the truth, I'm not that interested. I'm just glad they found us (42).*

An August 1986 Tobacco Institute memo reflected the buy-in of women's organizations,

> *We began intensive discussions with representatives of key women's organizations. Most have assured us that, for the time being, smoking is not a priority issue for them (42).*

Women's groups that take tobacco money rarely support antismoking campaigns (43). For example, in 1991, the Congressional Caucus on Women's Issues introduced the Women's Health Equity Act. Although the package included 22 bills, with six on prevention, none of the proposals addressed smoking (43).

Mainstream minority organizations have also not been in the forefront of activism against tobacco industry practices that target their members. *The National Black Monitor*, inserted monthly into 80 Black newspapers, ran a three-part series on the industry. The series' first article called upon Blacks to "oppose any proposed legislation that often serves as a vehicle for intensified discrimination against this industry which has befriended us, often far more than any other, in our hour of greatest need" (42). Another installment, ghost-written by RJR, argues that "relentless discrimination still rages unabashedly on a cross-country scope against another group of targets—the tobacco industry and 50 million private citizens who smoke" (42).

Sponsorships thus serve many purposes and are a potent addition to advertising and promotion strategies. The marketing of tobacco products has been overwhelmingly successful in the United States. Even while prevalence rates among male smokers were declining by half, from 52 percent in 1965, women's rates of smoking rose, finally declining by only one-third, to equal prevalence among males (53). In recent years, organizations such as the National Organization of Women, Women's Policy, Inc. (the non-government organizational affiliate of the Congressional Caucus for Women's Issues) and the American Medical Women's Association, have actively refused tobacco funds and have worked in the area of women's health and tobacco control. These actions and activities by women's organizations are noteworthy and important to document.

Placement of tobacco in popular culture

Tobacco also finds it way into popular culture through exposure in films, television, and music. While the tobacco industry states that it no longer pays to have brands placed in popular movies (no expenditures were reported to the Federal Trade Commission in recent years), during the 1980s, Brown & Williamson paid Sylvester Stallone $500,000 to smoke its cigarettes in six films (54).

Several studies note the pervasiveness of tobacco in popular films. One study that looked at smoking in movies for four decades (1960-1996) found that tobacco depictions in movies increased in the 1990s to levels found in the 1960s (54). To analyze this trend, the researchers divided the total amount of time in each film's length into 5-minute segments. In the 1990s, one third of the 5-minute time intervals in the films contained a tobacco reference, with 57 percent of the major characters smoking. From 1991 to 1996, 80 percent of the male and 27 percent of the female leads smoked. The studies also noted the increasing appearance of cigars, with all of the five films in their 1996 sample depicting cigar use.

Another study examined the top 10 moneymaking films from 1985 to 1995 and found that 98 percent of them had references that supported tobacco use, such as showing smoking or smoking paraphernalia (55). Again, one-third of the 5-minute segments portrayed pro-tobacco events, and in 46 percent of the films, at least one lead character used tobacco. In 1996, a newspaper reported that the top 10 grossing films of that year all contained tobacco use, as did 17 of the 18 films in distribution (56). A 2-year study commissioned by the US Department of Health and Human Services and the Office of National Drug Control Policy found that 89 percent of the top 200 movie rentals of 1996-1997 contained scenes of tobacco use (57). Children's animated G-rated feature films also portray tobacco use. Of 50 such films produced from 1937 to 1997, 68 percent displayed at least one episode of tobacco use, including all seven such films released in 1996 and 1997 (58).

Numerous sites on the World Wide Web offer tobacco products, clothing and fantasies.

Film stars portray tobacco use more frequently than is prevalent in society, and overestimating the number of peers who smoke is a known risk factor for smoking (54). John Travolta, Gwyneth Paltrow, Winona Ryder, Brad Pitt, Julia Roberts, Whoopi Goldberg, Bill Cosby and other popular stars who smoke on film have broad appeal beyond the United States, helping to spread the smoking image to countries where tobacco advertising is restricted. Perhaps the ultimate portrayal of tobacco in film is the 1999 release *200 Cigarettes*, which shows young people with little to do other than hang out in bars, clubs and the like, smoking.

Television also offers opportunities to show characters smoking. One study of prime-time television in 1984 found smoking taking place at a rate equal to once per hour (59). Asimilar study in 1992 found the same rate per hour occurrence, with 24 percent of prime-time programs on the three major networks depicting tobacco (60). Popular music is another venue for portraying tobacco use. Music videos shown on television make the visual connection between tobacco and music, with one study finding tobacco use shown in 19 percent of the music videos shown on four music video networks (61). Posters advertising new music releases and the CD covers themselves show the musicians using tobacco products.

Philip Morris uses music to attract women to smoking. The company has sponsored a live music series, *Club Benson & Hedges*, at clubs in cities such as Los Angeles and New Orleans. In 1997, Philip Morris launched its own record label, *Woman Thing Music*, that matched its print ad slogan, "It's a woman thing." Featuring new women performers, the CDs are marketed with packs of Virginia Slims. A music tour included auditions in the cities where performances were held. Admission to some of the performances was free, and attendees received Virginia Slims gear.

Women's magazines, too, provide visual smoking messages (discussed in a later section of this paper). In addition to formal cigarette advertising, advertising for other products, such as clothing and accessories, may feature popular models who are smoking. Stories about popular screen stars or models often include photographs of them smoking. It appears that even though the terms of the Master Settlement Agreement in the United States preclude the tobacco companies from specifically targeting teens in their advertising, the companies are not only continuing to target youth but are actually reaching more of them. As noted in recent press releases from the American Legacy Foundation, cigarette makers have increased their advertising in magazines with large teen readerships.

The Internet offers the most modern opportunity to market tobacco products to women. Numerous sites on the World Wide Web offer tobacco products, clothing and fantasies. *Smoke* magazine (http://www.smokemag.com) offers smoking related clothing and accessories. Other sites (e.g., http://www.verinet.com/~jejs/gallery.html) feature photographs of women smoking, some of which are pornographic. There are also photographs of women celebrities who smoke (http://www.cs.brown.edu.people/lsh/docs/glamor.html). An interactive novel that has background photographs of women and sex-filled scenes can be found at http://www.opus1.com/brink/tar. Many sites offer tobacco products by mail, some at discount prices and with few or no protections to prohibit sale to minors.

The major tobacco companies operate their own websites, on which company and product information mingles with promotional material. For example, the Brown & Williamson site includes sections on their sponsorship of community organizations and their programs to reduce youth use (http://www.bw.com). Their sponsorship of Fishbone Fred, a Grammy-nominated children's performer, is noted on the site. Fred's performance tours include his song "Be Smart, Don't Start," and his

Safety Songs for Kids cassette is marketed at the Brown & Williamson site.

Thus, messages about tobacco use pervade popular women's culture. These messages boost the advertising and promotion campaigns that tobacco companies use to target women. Popular culture reinforces the themes of marketing campaigns and sends exaggerated messages about the pervasiveness of women's smoking.

Current marketing strategies in the United States

Contemporary (Summer 1999) tobacco advertisements and promotions reveal marketing patterns carried forward from the beginning of the 1990s. The women's brands continue to market romance, glamour, independence, and the "in-charge" woman. Virginia Slims (Philip Morris) uses the "It's a woman thing" slogan, with ads that portray feisty, but sexy, women making comments about men. One ad shows a woman looking at a trophy and a stuffed moose head, saying to her guy, "The real reason we have garage sales? Your stuff" (62). In this ad, the woman is demonstrating her control over the domestic sphere, and mocking her partner's ability to control his spending. *In Style* carries a VS ad showing a man and a woman each driving a blue convertible and also shows a shot of the woman's foot in a high wedge sandal decorated with fake fruit. The copy reads, "So maybe we define practical a little different than you" (63). Another ad features a woman in a blue dress pushing a guy in a black suit off of a pool's edge. It says, "When you ask what you love most about us, answer carefully, and quickly" (64). Again, these ads assert women's difference from men and reinforce their "in charge" abilities.

Capri (Brown & Williamson) still uses the slogan, "She's gone to Capri and she's not coming back," with a Mediterranean boudoir overlooking the city below (65). Basic (Philip Morris) uses a "Keep it Basic" theme that shows the pack (66), while other discount brands, such as GPC, (Brown & Williamson) show a woman at the edge of a lake at sunset "Best smoke of the day" (67), and Doral (R. J. Reynolds) features a cat staring at an oversized goldfish in a bowl "Imagine getting more than you hoped for. Get your paws on big taste, guaranteed" (68). Themes of relaxation and pleasure from smoking can be increasingly observed in magazine advertisements.

Merit (Philip Morris) touts it ultralights with a series of spoof ads, "Discover the rewards of thinking light," that depict a sumo wrestler in pointe ballet shoes taking a leap (69) and an Eskimo musher and his loaded sled being pulled by a dachshund (70). Carlton (Brown & Williamson) uses its familiar blue and white format to feature its 1 mg of tar, "Isn't it time you started thinking about number one? Think Carlton. With 1 mg. tar, it's the Ultra ultra light" (71). Camel, after withdrawing Joe Camel, turned to parody ads, many of which spoof the Surgeon General's warnings by printing a large "Viewer Discretion Advised" box in the ads, noting what out-of-the-norm symbols you can find in the ad. For example, one ad shows a young man behind jail bars and an overweight cop. The second page reveals, from a back view, that the young man is a cutout figure made of Camel's packs. The ad advises that "this ad contains package tampering, self parole, and overdue books" (72). Another ad shows a jungle scene, with women and men in a large cauldron over a fire. The "viewer discretion advised" box warns of "hungry women, hot guys, and man stew" (73). Another ad spoofs the latest anti-health resurgence of large steaks and big drinks. It shows a street parade with floats. One float has a large golden Camel, a pyramid, an overweight sultan, and belly dancers. Another shows a huge dancing steak, and butchers (one smoking a cigarette) holding sausages and hams. The "viewer discretion advised" box notes the "politically incorrect parade, red meat and moving violations" (74).

Marlboro's current ads feature a two-page Marlboro cowboy, "Come to where the flavor is" (75), scenic cliffs with "Come to Marlboro country" (76) and a deep blue riverside cowboy scene for Marlboro Lights (77). Marlboro Lights enjoy extensive popularity with women and girls, who may prefer its milder taste. Lucky Strike (Brown & Williamson) has a retro ad, featuring a diner with a male customer smoking and a faceless waitress, with the slogan, "An American Original" (78). Newport's (Lorillard) "Alive with pleasure!" ad shows a man clowning with an umbrella with a woman at the beach, with a bright green sky (79). Another menthol, Kool (Brown & Williamson), also features green prominently in its "B Kool" ad, showing a large man's arm with chain-link bracelet holding a lit cigarette and a pack of Kools. The ad shows two nonwhite women looking at him and a black man with his arm around one of the women (80). In the United States, menthols are used more frequently by nonwhites.

Winston Lights (R. J. Reynolds) uses its red and white motif to sell its "No additives, no bull" theme. One ad proclaims, "Blue collar. White collar. How about no collar. No bull" (81). It shows two men and a woman in a

recording studio. Another approach is used in an ad in which a woman looks disgusted as she says, "I wanted a light, not his life story. No additives. No bull" (82). An edgier ad for Regular Winston (R. J. Reynolds) is a two-page spread. One page has a grainy black and white photograph of a flying saucer spaceship. The copy on the corresponding page reads, "If aliens are smart enough to travel through space, why do they keep abducting the dumbest people on earth? Winston. Straight up. No additives. True taste" (83). Interestingly, Asian models are starting to appear in tobacco ads. A Virginia Slims ad mentioned previously (62) features an Asian woman, and a Merit ad features a sumo wrestler (69). The industry obviously sees great potential in marketing to women in the United States and Asia, since smoking prevalence among Asian women is low in both parts of the world. In essence, advertising becomes globalized when the same ad is used in different countries.

CURRENT MARKETING STRATEGIES TO WOMEN AND GIRLS IN ASIA

Women and girls in Asia represent a vast untapped market for the tobacco industry. Despite the financial crises occurring throughout Asia, transnational tobacco companies have continued to identify positive aspects of the Asian market. A recent editorial in *Tobacco Reporter* exemplifies this optimism, "The situation does not fundamentally change the underlying strengths of the market. Rising per-capita consumption, a growing population, and an increasing acceptance of women smoking continue to generate new demand" (84). Changing gender roles combined with increases in women's earning power may lead to increased resources being directed toward tobacco consumption.

Just as in the United States, marketing in Asia is a crucial component of the industry's expansion and is the primary method of competition within a highly concentrated industry dominated by a small number of relatively large firms. The largest international tobacco company is Phillip Morris, with 17 percent of the global market, of which 8.5 percent is accounted for by Marlboro, the world's most popular cigarette (85). British American Tobacco (BAT), which has recently merged with Rothmans, has 16 percent of the global market share (86). Japan Tobacco, which bought out R. J. Reynolds, has become the third largest tobacco company (87). China National Tobacco Corporation also has substantial shares in the global market.

Industry documents reveal that in 1993, a BAT corporate strategy, code named *Project Battalion*, was conceptualized, which targeted marketing efforts at a hit list of the "top 50 cigarette markets." Asia was the largest target, with China at the top of the list, closely followed by India and Indonesia. Other Asian countries, including Thailand, Malaysia and Vietnam, were also included on the list (88). Multinational tobacco companies are already doing an impressive business in Asia: the continent consumes almost half of the world's cigarettes (89).

Cigarette sales, which had fallen by almost 5 percent in North America between 1990 and 1995, increased by 8 percent in the Asia Pacific region during the same time period (90). In 1996, 70 percent of cigarettes sold by Phillip Morris and almost 60 percent of cigarettes sold by R. J. Reynolds were sold overseas, with exports totaling 11 billion packs of cigarettes (91). It is estimated that sales in Asia alone will increase by 35 percent by the year 2000.

Tobacco companies rank among the 10 top marketers in several Asian countries. In Hong Kong, Phillip Morris is the ninth largest marketer, with an annual spending of $12.9 million. In Malaysia, three tobacco companies rank among the top four marketers. Rothmans ranks as number one with annual spending of $36.2 million; BAT ranks as number 2 ($19.7 million); and R. J. Reynolds is number 4 ($9.5 million). In the Philippines, Fortune Tobacco, a licensee of R. J. Reynolds, is the eighth largest marketer, with an annual expenditure of $17.9 million (92). While it is not possible to determine what percentage of the overall marketing expenditures is spent on women and girls, it is important to consider that tobacco advertising in Asia is so ubiquitous that it has a powerful effect on all, including young children. What can be said with some certainty is that women and girls are strategically important to the long-term growth of the industry.

In a marketing strategy paper, BAT outlined details for transforming their staid, traditionally male Benson & Hedges brand to a woman's-appeal cigarette, as part of "up-market socializing." Describing their present male smokers as loyal but "getting older," the paper reports, "in many ways, they (men) represent the cigarette world of yesterday, rather than the market of tomorrow" (93). It is women and girls to whom they will turn for tomorrow's market. Women in China represent the largest potential market for the tobacco industry. As noted by a vice president of Phillip Morris Asia some years ago, "No discussion of the tobacco industry in the year 2000 would be complete without addressing what may be the most important feature on the landscape, the

China market. In every respect, China confounds the imagination" (94).

Marketing expenditures in China are substantial: In 1994, Marlboro was the biggest advertiser ($5.2 million), followed by 555-State Express ($3.1 million), which is produced by PT BAT Indonesia. The fact that there has been an absence of domestic cigarette advertising in China has allowed foreign tobacco companies to use their marketing expertise with great effect. Intensive marketing efforts by transnationals seem to be paying off as smoking is reported to be on the rise at present, particularly with men. With trade restrictions still in place, current sales of foreign cigarettes in China are somewhat limited (95). However, a former BAT executive with knowledge of the company's Chinese operations reported that, in 1995, BAT sold 400 million cigarettes to the State company China National Tobacco Corporation, 3 billion to duty-free shops, 4 billion to special economic zones, and 38 billion to distributors who smuggle the goods into China (96). In fact, there is evidence to suggest that smuggling is good for business, as it keeps the price of foreign cigarettes down (no taxes are levied) and eliminates the need for warning labels (97).

Despite the fact that advertisements are not allowed to mention cigarettes or actually show people smoking, foreign cigarettes have become firmly entrenched in China and may influence brand preference and future buying patterns. Foreign brands are regarded as important status symbols in China (98). A recent study of 1,900 college students in three Chinese cities revealed that Marlboro was the most familiar brand cigarette as well as the most preferred brand (99). Importantly, both nonsmokers and smokers were equally familiar with tobacco products, suggesting that communal knowledge is a better predictor of familiarity with cigarette brands than is smoking status. It is disconcerting to consider that advertising effects may be amplified in such a market, where information gleaned from cigarette advertisements is effectively channeled into a shared pool of knowledge among women and men. Cigarette advertisements for products such as Marlboro and Salem may be a particularly potent force in China and other Asian countries, since their level of sophistication renders them visually distinct from indigenous advertising.

Interestingly, global advertisements sometimes require "makeovers," as was the case with the Marlboro Man when he first appeared in Hong Kong. During an interview, the advertising director for Hong Kong's Leo Burnett, the advertising agency responsible for creating Phillip Morris'Marlboro Man in the United States explained how people in Hong Kong did not identify with the worker image of the cowboy, although the horse is a very good symbol to the Chinese, representing health, success, vitality and energy. The Marlboro Man had to be transformed and upgraded from being an old laborer into a leader (100).

Consumer culture

An understanding of consumer culture is critical to a discussion of the marketing of tobacco to women and girls in Asia. Consumer culture can best be characterized as a culture of mass consumption, wherein the consumption of goods carries with it the consumption of meaning and symbols. Consumer culture is visual and images—often images of western-styled modern women—play a dominant role. Through the practice of consumption—by buying the advertised product—one can create a new identity. Consumer culture "holds out the promise of a beautiful and fulfilling life: the achievement of individuality through the transformation of self and lifestyle" (101). Tobacco advertising engages the consumer in a fantasy, inviting one to participate in a promise "that the product can do something for you that you cannot do for yourself" (102). Although only the elite in the developing world can consume in a truly Western manner, cigarettes can fulfill this promise in an inexpensive form. In some countries, when more costly foreign brands are purchased, they are purchased as single sticks, rendering them more affordable.

Three important points may be noted with regard to consumption in Asia, particularly in developing countries. First, regardless of whether an individual chooses to consume the product (the cigarette) or not, he or she can still observe and absorb the image. Like window-shopping, observing ads can serve as a vicarious form of consumption. Second, despite the fact that many people in Asia, particularly women and girls, are illiterate, it does not preclude visual literacy. That is, even those who cannot read are influenced by and understand the intent of image-based tobacco advertising. Third, these pervasive, highly seductive images of what cigarettes can do for you exist in environments where there is little information available on the negative health consequences of tobacco use.

In the Western world, identity is not ascribed by or anchored in tradition or religion, but is rather something that an individual chooses. Youth, who are often caught between the traditional world of their family and the

modern world they encounter in advertisements and the media, may be particularly susceptible to images of modernization that link products with feelings, emotions and lifestyles. For young women, creating a new fashionable identity is intricately linked to the body. When interviewing female college students in South India, one of the authors was repeatedly told that in order to wear Western clothes (e.g., jeans and short skirts), and look good in them a girl *needed* to be thin, whereas traditional dress, which is loose and unfitted, was viewed as complimentary to all women, Western dress required that one have the "right" body shape. In the global consumer culture, having the right body becomes central to a woman's identity. By using women's bodies as a way to sell cigarettes, the tobacco industry reinforces a strong association between the two.

Women's bodies and the selling of cigarettes

Although women's bodies have been used to sell tobacco, alcohol, and other products worldwide for many years, current tobacco advertising in the Philippines provides some excellent examples of this strategy. A prominent medium of cigarette advertising in the Philippines is calendars, produced and widely distributed by Fortune, the largest tobacco company. On one calendar that is plastered in local *sari-sari* provision shops throughout the islands, a fair-skinned model is seated with her legs wide apart, wearing a see-through, netted bra and silk boxers, gazing off into the distance. Behind her is a box of Hope cigarettes, which is almost as large as she is. She clutches a pack of Hope in one hand, and in the other, she holds an unlit cigarette. Appearing to be absorbed in her daydreams, her image suggests that her cigarettes can help her relax and enjoy the experience. In fact, observational data suggest that Hope is the cigarette brand of choice for many young Filipinas (103). The brand name itself reflects the dream of many Filipinas, that is, the hope for a better life and a good marriage.

In another ad, a light-skinned model with pronounced cleavage is seated on a deck overlooking the ocean. She wears only an oversized men's shirt, unbuttoned to reveal most of her breasts and a baseball cap with "Alaska" written across it. Her pose is provocative, and her eyes boldly stare at the viewer. In her hand, she holds an unlit cigarette. Pictured next to her are two cameras, leading one to imagine that she is a photographer. A carton of Champion cigarettes and two unopened packs lie next to her legs. The logo for Fortune Tobacco Company is visible in the corner of the calendar.

The model (the same one is featured on both calendars) embodies the construction of a Filipina beauty: She is a Euro-American mestiza, with white skin and a pronounced "American-style" nose. Her unbuttoned blouse reveals her "American-sized" breasts, referred to locally as *pakwan suso* or watermelon breasts. Large breasts, such as those of *Baywatch*'s Pamela Anderson, are discussed and admired by Filipino women, who refer to their breasts as small fruits ("calamansi suso") in comparison with those of foreigners (104). Not only is this Fortune model endowed with a beautiful "Western" body, but she is also daring enough to show it off in revealing attire. Typically, Filipino women are modest and do not go to the seashore in anything less than a T-shirt and blue jeans for fear of being labeled promiscuous.

Remarkably, these calendars find their ways into the homes of villagers in remote islands of the Philippines, where they are tacked up in small, one-room thatched homes where they confer images of beauty and whiteness, which serve as much desired symbols of modernity and wealth. Such images are typically hung near the family religious shrine consisting of statues and candles, often side by side with Jesus and the Virgin Mary. In fact, one Fortune Tobacco calendar "ingeniously used the Filipino faith in Mother Mary" (105) to sell cigarettes. It featured the face of a very white Mary (sometimes called American Mary), bordered by all 17 brands of cigarettes distributed by Fortune Tobacco.

In Tonga, multinational corporations such as Benson & Hedges and Royal Beer serve as sponsors for beauty contests.

Similar to the advertising in the Philippines, in Vietnam, women's bodies are commonly used to sell products, particularly on posters for beer and cigarettes. Such posters typically portray big-busted foreign women in scanty clothing. In real life, women's bodies also become the medium by which cigarettes become distributed to men. On the streets of Hanoi, for example, young attractive women are employed to stand on street corners dressed in the recognizable colors of cigarette brands, smilingly giving away free samples to passersby (106).

In Tonga, multinational corporations such as Benson & Hedges and Royal Beer serve as sponsors for beauty contests, replacing the original sponsors who were the heads of extended families and the *eiki* or ruling class.

The winner of the contest then becomes the spokeswoman and promoter of these products for her reigning year. Importantly, the shift in sponsorship has also been marked by shifts in desired body shape. Increasingly, the body of choice is a more streamlined Western body, thus narrowing notions of diversity and promoting a global consensus of what constitutes beauty (107).

Women's brands in Asia

As in the United States, women's brands of cigarettes have been introduced in many Asian countries, typically with themes highlighting independence, sophistication, glamour, and sexuality. These image advertisements hold particular appeal to young and impressionable women and girls who seek to emulate or acquire the attributes of the models in the ads. Not uncommonly, women's brands in Asia feature Western models. For example, advertisements for Capri Superslim cigarettes in Japan show a blonde-haired woman who is both an executive and an artist, while Salem's Pianissimo cigarettes similarly feature a Nordic blonde. Why, we might ask, are foreigners used in these ads? What do they lend to the visual image and say about the product that a local model would not? To put it most simply, Westerners function as signs of the West. According to Japan's largest advertising agency, Dentsu, Caucasian models lend a sense of foreignness to Japanese products, serving as symbols of prestige, quality and modernity (108, 109).

Remarkably, however, the Tobacco Institute of Japan, headed by the President of Phillip Morris'Japan branch, insists that the ads of women that grace the environment are targeted at men (110). The Institute echoes the time-weary argument that advertising and marketing activities do not cause new segments of the population to initiate smoking, but rather are designed to influence existing smokers to switch their brand loyalty.

To emphasize the link between smoking and fashion, Vogue cigarettes in Japan feature a "whippet-thin, chiseled cheek-boned model" who stares coolly into the distance as an adoring man nuzzles her neck. Floating in the corner of the ad is a pastel-colored pack of cigarettes. In case her European features are not obvious enough, flowing Japanese script declares 'This woman is Vogue" (110). In the globalized context of consumer culture, a Western woman and her choice of cigarettes project a powerful symbol. Interestingly, the brand Vogue is described in the European journal *Tobacco* "as a stylish type of cigarette with obvious feminine appeal, being slim and therefore highly distinctive" (111).

According to an advertising expert in Tokyo, "Tobacco companies are putting a great emphasis on advertising low-smoke cigarettes that are basically designed for women who hate to have their hair and dresses spoiled with the smell of tobacco smoke" (112). R. J. Reynolds has marketed Pianissimos as a low-smoke, reduced-smell version of Salem that has been popular among women (113). Smoking among young Japanese women has been on an increase in recent years, although as recently as 1950, smoking was considered to be a habit of professionally promiscuous women, such as prostitutes and geisha. This is true in other Asian countries as well (114). In 1986, the prevalence of smoking among Japanese women in their twenties was 16 percent, and that in 1996 was 20 percent. Among teenage girls, smoking rates rose from 5 percent in 1990 to 15 percent in 1996. During the same period, smoking among adolescent males rose from 26 to 40 percent (115).

Foreign brands, like foreign models, are gaining popularity in Japan. A Phillip Morris executive in Japan, commenting on the growth of their products, noted, "We have been relentless in the last few years. Our marketing is really good: I think we're feeling the pulse of the consumer as well as possible. For many years, Marlboro was a slow burner here, but now it's on fire. It's growing more than 25 percent year-to-year" (116). Although clearly not advertised as a woman's cigarette, Marlboro is the most popular brand among male and female adolescent smokers in the United States, with 60 percent of the market share (117).

Recent data from Thailand indicate that young smokers prefer foreign brands and that young women in particular show a marked preference for foreign cigarettes, especially Marlboro Lights. Little research to date has identified what underlies these preferences, although it is not difficult to imagine that there is a connection with weight control and concern with smoking what is perceived to be a "healthier" cigarette (118).

In India, where smoking among women and girls is generally considered to be culturally inappropriate, a BAT subsidiary launched a women's cigarette named Ms. in 1990. The introduction of this cigarette involved large-scale promotion and the use of attractive female models who promoted the product and gave away free samples. In response to protests by women activists about the direct targeting of women and girls in a culture where females do not smoke, company representatives rallied to the defense of Ms., explaining that "the brand was targeted toward emancipated women; that they were showing models only in Western rather than traditional

Indian dress; and that the female models were not actually shown smoking" (119). Concerned that Indian women might be hesitant to purchase the cigarettes in shops, advertisement copy proclaimed, "Just give us a call and we will deliver a carton at your address!"

More recently, in 1997, Just Black, a new cigarette in an all-black box, was introduced in Goa, India. The advertisement for this product featured a young, fair-skinned woman sporting long pigtails, a tennis outfit and a demure smile. She is shown leaning against a large black motorcycle holding her tennis racket, seemingly waiting for her boyfriend, her tennis partner, to return. She at once appears innocent and sexy, and the reader is left to wonder whose cigarette it is: his or hers? The handwritten copy reads, "me and him and Just Black," implying that it is "their" mutual friend, something they share. It is an interesting circumventing of cultural prohibitions on women's smoking; her smoking is implied, although not overtly spoken about. The advertisement also posits a spurious association between being athletic and being a smoker.

Industry documents reveal that the "Just Black" campaign arose out of a secret BAT project, code-named "Project Kestrel," whose objective was to develop a brand that "breaks the rules," appeals to a new generation of youth, and shocks their parents (120). The memo directly refers to the "literate youth of today, being very image-oriented" who *require* a brand of unique cigarettes, not like Marlboro, "but which are completely unconventional, which set new standards encouraging their rebellion, not necessarily just against parents." This new brand would be responsive to teens' individuality and have a totally distinct brand name "so that no preconceived ideas could be formed." The brand needed to reflect durable youth values such as rebellion and the glamour of danger. The packaging was to be distinctive, preferably black, a color that was noted to be popular among youth (120). Despite the obvious ramifications of increased marketing to youth, the industry adamantly denies that it has specifically targeted them. "When it comes to the youth issue," notes one untitled document, "our critics are running to the front of the parade, where we've been marching for years: We've never marketed our products to children, and we will never do so...reports of us trying to sell cigarettes to minors have simply been fabricated" (121)

Although China presently consumes 30 percent of the world's cigarettes, this market could be substantially enlarged if women, who presently constitute only 2 percent of this figure, could be enticed to smoke. Attempts to lure women into smoking have recently been documented. In 1998, two new Chinese cigarette brands were introduced, targeted at women smokers. Chahua and Yuren (literally "pretty woman") are promoted as low-tar products, delivering 12 and 15 mg of tar, respectively, in contrast to the average 18-mg delivery of other domestic cigarettes. Yuren is described as slim with a white filter and "mild" taste (122). Cigarette advertising worldwide has persistently used images and language to reassure present and potential smokers that they can engage in "healthy smoking" (123). In actuality, when smoking lower-yield cigarettes, smokers puff more frequently or more intensely than when smoking higher-yield cigarettes to try to obtain their usual level of nicotine (123).

Interviewed about this new product, the manager of the Kunming Cigarette Factory was quoted as saying, "China has more than 30 million female smokers, and yet China made no cigarettes specially designed for women. In the past, women smokers had to rely on imported and smuggled cigarettes made for female smokers" (124). There are no data available at present about the popularity of these products among Chinese women, and it will be important to monitor their growth as well as the development of other women's brands. Throughout Asia, packaging is an important component of women's brands and promotional materials. The "feminine touch" is apparent: Brown & Williamson's Capri cigarettes are sold in slim white boxes and feature a floral design. In Vietnam, feminine-style lighters available in the marketplace include ones that are slim and pink (imported from Japan), others that resemble a perfume bottle, and lighters featuring a romantic picture of a couple (125).

Prominent themes in advertising to women and girls in Asia

Several key themes noted earlier in the section on the United States have been documented in cigarette ads targeted at women and girls in Asia. These include:

Independence. The woman who smokes is typically depicted as free and autonomous. Phillip Morris advertised its Virginia Slims brand with the slogan "Be You" and "You're on Your Way." One Virginia Slims ad in Japan features a ballerina with the caption, "I want to dance to my own music without others'direction." A Japanese brand, Frontier Slims, echoes a similar theme of independence. It features a young-looking, slim Japanese woman with the copy stating, "I care for my feelings, not for others!" (126).

Research confirms that the theme of independence is important to women smokers. In a study conducted among female airline cabin crew from 10 Asian countries, it was found that when shown a Virginia Slims advertisement and asked to classify the woman featured, more smoking than nonsmoking respondents viewed the woman as attractive, elegant, fit and sociable. The authors suggest that these women may smoke to enhance their images of independence (127).

Stress relief. Intensive market research conducted in the United States has allowed for sophisticated segmentation of the female market. These strategies are being transferred abroad. An industry document from Brown & Williamson shows a plan to market cigarettes for working women who have to juggle multiple roles. It states: "Keep it simple. Make them comfortable, To deal with the stress, complexity and speed, they will be looking for relief" (128).

Stress and tension relief are common themes discussed among youths with regard to smoking in the United States and Asia (129). For example, when Hong Kong youths were asked about the positive attributes of smoking, the most commonly cited item among ever-smokers was "smoking calms your nerves," reported by more than one third of the male and female informants (130). Similarly, the study described above among female airline cabin crew found that the most common reasons for smoking for these women were to control their mood, to gain control over their life and to help cope with stress (127).

Weight control. As discussed earlier in this paper, the association between weight control and smoking has been documented in the marketing of cigarettes to women for many years. In one study among Asian women that specifically asked about smoking and weight control, it was found that almost 40 percent of the women sampled believed that smoking would help control body weight (130).

Tobacco use as a gendered experience

At issue is not just that females are smoking with greater frequency in Asia, but the question of why this shift is occurring. What role does smoking play in the lives of women and teenage girls? If women and girls are beginning to smoke more—and at younger ages—why are they doing so? Beyond the advertised image, what is women's experience with tobacco, and does it differ from the experience of men? In other words, from the layperson's perspective, does smoking confer distinct benefits for men and women? To answer these questions, it will be necessary to consider the behavior of females and males within specific cultural contexts. While few published studies have been conducted on gendered patterns of smoking, some anthropologic accounts from fieldwork in the Philippines, Vietnam, China and India provide preliminary insights into this topic.

The Philippines. Survey research on tobacco consumption in the Philippines reported that 73 percent of the adults, about one-fifth of them women, smoked, with 56 percent of the children (aged 7-17 years) reported to be "regular" smokers. This represents a substantial rise in cigarette consumption from 1987, when 46 percent of the adults and 22 percent of the children smoked (131). Little is known about the age of smoking initiation among women and girls. While there are no distinctive "women's brands" on the market, the popularity of particular brands seems to exist among women of different ages.

Although almost 20 percent of women presently smoke, smoking is a private habit for women rather than a public one (132). While some women in their twenties do smoke when they go to bars or clubs, if they are seen smoking on the street, their behavior may be misinterpreted. Men routinely discourage their girlfriends from smoking outside, warning them overtly, "Don't smoke. It doesn't look good: you'll look like a prostitute" (132). Both smoking and drinking are commonplace among bar girls and among the foreign men who frequent these establishments.

Despite cultural restrictions toward smoking among young women, it is acceptable among older women, who tend to smoke alone rather than in social situations. Observations of Filipino women who smoked found that cigarettes are often used as a substitute for expressing feelings, with smoking indicating sadness, anger or depression. In a culture in which it is inappropriate to talk about one's feelings overtly, one way a women can show displeasure or loneliness is to smoke quietly while listening to evangelical music. At such times, smoking may serve as a form of self-medication in an environment where few other resources are available. When a woman smokes, she is rarely talkative. Men in her household who observe her smoking may choose to leave her alone, recognizing that she wants her own space. In contrast to women's patterns of smoking, Filipino men light up frequently and in multiple social settings, be it at work, while drinking beer, playing pool, killing time, etc. When a group of men are smoking, women smokers typically do not join them (133).

Observational data and ethnographic interviews revealed that for some girls in their late teens, smoking is believed to help reduce hunger and reduce appetite (134). Young women in the Philippines are extremely conscious of their body shape and weight, and many are interested in losing weight to increase their popularity with the opposite sex. Considering the ubiquitous cigarette advertising featuring nearly nude, thin women, it is not surprising that some girls make an association between weight control and smoking. However, cigarettes are not considered to be suitable *(hiyang)* for everyone, and both cigarettes and alcohol are discussed in relation to one's body type. Some women complain that cigarettes are not *hiyang* for their body and that smoking results in undesirable weight loss (134). Research is needed to understand the changing pattern of smoking among young Filipino women and the complex association between dieting and smoking.

India. In India, cigarette smoking among females is rare and is presently confined to the urban elite classes of large cosmopolitan cities, such as Delhi, Pune, Mumbai and Bangalore. In these cities, modern girls are reported to smoke in pubs and at colleges, with particular colleges having "reputations" for female smoking. A note of caution should be raised, however. While conducting focus groups on smoking with female students at a medical college in a small South Indian city (Mangalore), one of the authors (M. Nichter) was told, "If you come back to India in ten years, all the professional women will be smoking!" When asked why this would be, responses included, "to be modern, to be free, to be like boys, for weight control, and for tension." "In the cinema," one girl explained, "a guy smokes when he is depressed, when he has tension. In Hindi movies, women also smoke—especially the modern wife" (135). Recently, a Hindi film "Godmother," featured smoking by the heroine. Her smoking was prominently featured throughout the film. The actress who plays the godmother, Shabana Azmi, is extremely popular and is known for her social activism. The depiction of such a well-known actress smoking may serve as a role model for other Indian women (135).

Further discussions with college students identified a strong association between stress relief and smoking, a connection clearly garnered from the media. As one male college student noted, "We know from advertisements that we see in the newspaper and in the cinema that cigarettes help with tension. In the ads, you see businessmen preparing their accounts, and they always have a cigarette in one hand and a packet on the table. In Hindi films, when the hero loses his girlfriend, he smokes a cigarette. Films and advertisements give us the reason why we should do it, and we follow" (136).

When female college students were asked what percentage of women their age in the United States were smokers, responses ranged from 50 to 75 percent. Further discussion substantiated that this impression was largely derived from watching imported movies from the West and from satellite television. Satellite television, another important factor in Indian women's exposure to female smoking, is increasingly popular and its influence includes dress style and behavior.

With regard to gender differences, several Indian girls noted that boys smoked to impress girls and that some male college students believed that "a cigarette in hand makes you a man." As one girl explained, "Boys feel great if they're smoking." When asked what image a young male smoker projects, responses were largely positive: being modern, macho, confident and fashion-minded. These depictions mirrored the images of men in popular cigarette advertisements and in the cinema. Although many of these young women actually disliked smoking, the majority thought it would be inappropriate to disclose those feelings to a male.

Despite the positive attributes assigned to the image of a smoker, male and female college students in India know of the health risks of smoking. In a survey conducted with more than 1,600 college students, over 80 percent believed that tobacco use was a problem among youth in India, and 90 percent stated that students should receive more information about tobacco in school settings (137). Many male students who smoked were interested in getting information on how to quit. Concern was expressed, however, that if one was accustomed to smoking and stopped, the body would be "shocked" and harmed (138). Cultural perceptions about tobacco were also identified. For example, college students believed that more expensive cigarettes are made of better tobacco, which is less harmful for health. In addition, they believed that it is easier to get addicted to more expensive cigarettes because they are smoother and easier to smoke. This results in higher levels of smoking.

It is important to emphasize that the vast majority of women in India do not smoke, and cultural restrictions continue to be in place throughout the subcontinent. While it is critical to understand changes that are occurring among some upper-class segments of the population, it is equally important to identify protective factors within specific cultural contexts that promote resiliency in women and girls and serve to inhibit their smoking.

Vietnam. In Vietnam, more than 70 percent of the men smoke, compared with 4 percent of the women. Smoking among women is considered to be unfeminine and a sign of promiscuity. One study found that, when asked about their attitudes toward male smoking, women believed that smoking was a strong, masculine behavior. "When I was young," one woman explained, "I liked my boyfriend to know how to smoke because it made him seem more manly." Despite the associations between smoking and masculinity, findings of a survey among Vietnamese women found that almost three-quarters were bothered by men's smoking (139). However, women expressed a feeling of powerless to object to their husband's or other men's smoking. As one woman poignantly noted: "If you hate cigarette smoke, you'll still have to marry a man who's heavily addicted to tobacco. Out of 100 men, 99 smoke. If you're afraid of tobacco then you'll have to live alone: it will be very depressing" (139).

> In Vietnam, more than 70 percent of the men smoke, compared with 4 percent of the women.

China. As noted earlier, smoking among Chinese women is rare, with only 2 percent of women presently smoking. However, cohort studies that have data from the 1970s indicate that, at that time, the prevalence of women smoking was higher (11 percent) (140). Traditionally, it has been considered inappropriate for women to smoke or drink. Although little qualitative data exist on smoking among women, a recent ethnographic study of changing gender roles in China, provides insights into this behavior (141). Some young working women who were interviewed expressed resentment at their social status compared with men. One young woman, aged 23 years, explained her discontent in the following way, "It's not fair. Women must have children, they must do housework: women can't smoke, can't drink." Not only did smoking and drinking serve as social activities that men could engage in with friends, but these behaviors also appeared to be powerful coping devices to deal with life pressures. These "resources" are presently unavailable to women. It will be important to document how Chinese women of different ages view cultural restrictions on smoking and whether their perceptions change over time.

Circumventing legislation: using brand stretching

In the face of increasing bans and restrictions on tobacco advertising in the electronic and print media throughout Asia, the transnational tobacco industry has been forced to become increasingly "creative," designing new forms of advertising in an effort to circumvent existing legislation and procure the product exposure that is critical to sales. Brand stretching, the use of tobacco brand names on non-tobacco merchandise or services, is a strategy that has been utilized worldwide by the tobacco industry. The explicit purpose is "to find non-tobacco products and other services that can be used to communicate the brand," together with their essential visual identifiers: the principle is to ensure that tobacco lines can be effectively publicized when all direct lines of communication are denied (142).

Internal documents from R. J. Reynolds define a similar strategy to circumventing bans, recommending "a creative approach to legal matters" to achieve "a balance between legal risks and desired benefits." Specifically, they advocate the adoption of cigarette brand names for "lifestyle products" such as clothing, shoes, and watches. Brand stretching has been practiced in Asia for some years, and a recent study in Hong Kong provides data on the impact of this strategy on youth. When asked whether they had recently seen cigarette logos on products, male and female students overwhelmingly reported that they had. These products included lighters (50 percent), ash trays (37 percent), T-shirts (28 percent), compact discs (26 percent), hats (21 percent), jeans (18 percent), backpacks (13 percent) and watches (12 percent), to name but a few (143). Although such products were not considered "advertisements" by the industry, they clearly have the effect of normalizing cigarettes, bringing them into the everyday lives of youths going to school. Other brand name-bearing items that have been observed are Marlboro Kleenex packets and Marlboro disposable cameras (144).

There are many examples of how brand stretching is being implemented throughout Asia, with Malaysia sometimes regarded as a "showcase" country. Although direct advertising was banned in 1993 and many tobacco control measures have been implemented (including raising taxes, banning smoking in many public places, and controlling the amount of tar and nicotine in cigarettes), indirect advertising is still permitted. Revealingly, in 1996, four of the top 10 advertisers in Malaysia had a cigarette brand in their name: Peter Stuyvesant Travel, Benson & Hedges Bistro, Dunhill Accessories and Salem Cool Planet (145).

Faced with a declining market share, Benson & Hedges

opened bistros in Kuala Lumpur that were well advertised on television and in newspapers. At these bistros, customers are served a special blend of Benson & Hedges coffee by waiters whose uniforms are adorned with a gold-colored cigarette package. Gold, a prominent color in all of Benson and Hedges-sponsored "experience environments," was purposely selected to represent the company's "confidence in a bright future" (146). As a spokesperson for a bistro explained, "Of course, this is all about keeping the Benson & Hedges brand name to the front. The idea is to be smoker-friendly. Smokers associate a coffee with a cigarette. They are both drugs of a type" (147). The bistros provide a context in which smoking is both anticipated and encouraged. Looking beyond their bistros, BAT noted that it was also planning to sell Lucky Strike clothing and Kent travel.

The effect of this "indirect" advertising is noteworthy: The number of smokers in Malaysia is increasing by around 3 percent per year, with the incidence among girls reported to have increased nearly threefold in the past 10 years (148).

Smoking at the discos. Another form of brand stretching has been the sponsoring of discos, which have an obvious appeal to youths. In China, BAT has aggressively and relentlessly pursued the youth market, including women. Three nights per week, one of Beijing's large discos literally becomes "transformed into a free-floating advertisement" for BAT's 555 brand of cigarettes. Entering the disco, one is greeted by "slim Chinese women in blue tops, miniskirts and boots emblazoned with the 555 logo, handing out free cigarettes. Customers crowd the smoke-filled dance floor, writhing to rock music below two huge banners with the 555 logo that proclaim: "Be free from worldly cares'" (149).

Similar enticements of young women have been reported in Sri Lanka, where less than 1 percent of women presently smoke, and strong cultural sanctions exist about women's smoking. While conducting fieldwork, researcher Tamsyn Seimon visited a disco sponsored by the BAT subsidiary, the Ceylon Tobacco Company. "Within a minute," Seimon writes, "a 'golden girl' approached me, holding out a box of Benson & Hedges: 'Here take one.'I took it—she encouraged me: 'Go ahead—I want to see you smoke it now.'I told her I thought it would make me cough. 'No, these are smoother, not so strong,'she reassured me. 'I want to see you smoke it now'" (150).

The golden girls, who were believed to be fashion models, were dressed in gold-colored saris and matching gold platform shoes. Throughout the night, the words "Benson & Hedges" flashed onto the walls of the disco with a laser beam as blaring music filled the room with the top 10 dance hits from the West. Benson & Hedges cigarettes and alcohol were freely available from these models. Prize drawings, which included Benson & Hedges key rings, shirts and caps, were given out repeatedly during the evening (150).

To further popularize and normalize their product, Ceylon Tobacco Company hires young women to "hang out" at popular shopping malls, on university campuses, and on upscale commuter trains, where they distribute free cigarettes and merchandise. Young women are also employed as drivers of bright red Player's Gold Leaf-brand cars and jeeps, from which they distribute free cigarette samples and promotional items, including hats, T-shirts and lighters (150). Notably, these women are paid higher salaries than those typically earned by a university graduate (151).

In the inner world of the disco in China, Sri Lanka and other Asian countries, young women are invited to participate in behaviors associated with being modern, fashionable and Western. They are directly cajoled and challenged to smoke by glamorous, thin fashion models whose attire is at once traditional (the sari) and modern (gold and glittery). Fears of the cigarette's strength are assuaged; these are mild cigarettes suitable for a woman. In contrast to the direct encouragement to smoke that young women encounter in the inside, protected world of the disco, in the outside world, where smoking remains culturally inappropriate, young women are utilized as vehicles for product promotion rather than as overt participants in the behavior. Both inside and outside, however, the connection between women and cigarettes is normalized through widespread and repeated exposure.

Selling fashion. The selling of fashion accessories in shops has become a profitable way to advertise cigarettes indirectly as well as to increase visibility of the products. For example, *Marlboro Classics* clothes, designed to capture the imagery of the "Wild West," are immensely popular, with over 1,000 established Marlboro Classic Stores in Europe and Asia (152). Similarly, R. J. Reynolds has designed *Salem Attitude* (clothing stores) in Asia in an effort "to extend their trademark beyond tobacco category restrictions." An internal document from the company unabashedly states, "The Salem Attitude image will circumvent mar-

keting restrictions" (153). In Thailand, *Camel Trophy* clothing, including T-shirts, pants, and other adventure style goods, have become very popular among young people. While many youths are unaware that the clothes are connected to cigarettes, Camel as a brand is becoming increasingly recognizable in the Thai market (154).

Product placement. One of the most prevalent methods of advertising in Asia is the prominent displays for cigarettes in local shops. In effect, the shop itself becomes the advertisement. Throughout India, for example, even in states that have enacted advertising bans (such as Kerala), the tobacco industry has provided signage for shops. These signs, which bear the name of the cigarette, are attractive, modern, and painted in the signifying color of the brand. Point-of-sale advertising is an excellent means by which new brands can get maximum exposure. Poor shopkeepers are more than willing to accept these signs that confer status to their shops. In Thailand and the Philippines, the distribution of display cabinets with company and brand logos is common in almost every corner store. The cabinets ensure that cigarettes are highly visible.

Sports sponsorship. The sponsorship of sporting events, a long-established form of brand stretching worldwide, has taken on a new intensity in Asia. In China, one of the most conspicuous examples of the commercialization of contemporary Chinese society is found in sports. Phillip Morris invests heavily in soccer and sponsors the national league known as the "Marlboro Professional League." During these extremely popular, nationally broadcast games, ads for Marlboro are seen everywhere in the arenas (155). Basketball is also a popular sport, and in 1996, a spokesperson for Chinese basketball noted, "We are developing our commodity economy and professional basketball treats players as commodities—so this is our direction" (156). Not surprisingly, one year later, in 1997, Chinese basketball acquired its own professional league—the Hilton League—after the cigarette brand of their sponsor (157). Another popular event with cigarette sponsorship is the 555 Hong Kong-to-Beijing motor rally, a long-distance automobile race televised nationwide (158). While one might traditionally think of these sports as male-oriented, women in many countries share in the excitement that such programming brings into their homes.

The popular tennis star, Michael Chang, regarded as an idol of teenage girls, regularly plays in Marlboro and Salem tennis events in China, Japan, Hong Kong and Korea. Arecent release of industry documents shows that Chang was paid $80,000 (US) to "maintain a good relationship" with the company. In addition, the organizers of the Salem Open, Hong Kong's leading tennis event, signed a contract stating that they would use their "best efforts" to prevent players from criticizing smoking. Marlboro executives described Chang's signing "as a coup" and proudly disclosed in a sales review that: "We have been successful in drawing an unusually targeted audience to this otherwise fairly upscale sport in great part due to Michael Chang's enormous popularity" (159).

Notably, one survey conducted among 6,000 male and female Hong Kong secondary school students found that more than one third of these youths had watched a tobacco-sponsored tennis tournament (160). In addition, children stopped on the street during a Salem tournament who were asked what cigarette Michael Chang smoked quickly responded, "Salem!" In 1995, Princess Diana attended the Salem Open Tennis Tournament in Hong Kong and accepted a check from the sponsor, R. J. Reynolds, as a donation for the Hong Kong Red Cross (161). The linking of internationally regarded women with tobacco sponsorship serves to legitimize and valorize the industry, transferring attention from the selling of addiction to more charitable works.

Although female athletes are less commonly the target of tobacco sponsorship, one notable exception was full-page ads that appeared in Malaysian newspapers. Featuring the popular female climber, Lum Yuet Mei, suspended from a rock face, the copy read, "She took the challenge and realized her golden dream" (162). Displayed prominently on the page were the Benson & Hedges logo and the company's gold colors. In Vietnam, the manufacturers of Dunhill cigarettes have given almost a half million dollars in aid to develop professional soccer in the country (163). They also sponsor television broadcasts of Saturday night soccer, thus circumventing the country's advertising ban by showing only their logo with the slogan "The Best Taste in the World," without showing the actual cigarette itself (164).

Cricket, a sport that enjoys immense popularity in Asia, has long enjoyed tobacco sponsorship. In Sri Lanka, BAT began marketing Benson & Hedges by introducing it on a televised cricket match from Australia, where the Sri Lankan team, the defending world champions, was playing. This allowed the company to circumvent Sri Lanka's ban on domestic cigarette advertising (165). In India, Wills, a BAT subsidiary, is the official sponsor of the national cricket team, and its logo is prominently displayed on the outfits of the players. Cricket matches are

widely televised, and both male and female audiences go wild over the game. Child-size replica T-shirts are available internationally. Wills' sponsorship of cricket has been contested in India by tobacco activists, who insist that it be stopped. Aspokesperson for the Voluntary Health Association of India stated, "It (Wills'sponsorship) is not popularizing cricket in India, but hooking young people to the deadly smoking habit. The playing fields of India must not be turned into mass graves where children lie buried. It is this realization that has to seep into the Board of Cricket Control in India who have been accepting tobacco sponsorships" (166).

> For the past 5 years, the Philip Morris Group has sponsored the prestigious ASEAN Art Awards.

Advertising for the Marlboro Tour in the Phillipines, a 23-day cycle race on several islands declares, "...the Marlboro Tour is the biggest national summer sports spectacle held yearly in the Philippines..." Internal documents, however, describe a far more insidious plan behind this event, particularly for low-income Filipinos; "the tour inspires poor young men. It gives them hope of making it big. It answers their dreams" (167).

Sponsorship of music, art, and cultural events. In Sri Lanka, BAT circumvents a ban on cigarette advertising on the radio by underwriting a "Golden Tones Contest" on the English-language radio station, which is especially popular with trendy, Western-influenced youth. They also publish a weekly pop music supplement in an English-language newspaper, which features large, colorful advertisements for Benson & Hedges cigarettes with the motto "Turn to Gold" (150).

In Malaysia, Rothmans Peter Stuyvesant Brand sponsored a nationwide tour by Malay singer, Ziana Zain, who is very popular with teenage girls. BAT's subsidiary, the Malaysian Tobacco Company launched its Benson & Hedges Lights by organizing live concerts and subsequently releasing an album called Benson & Hedges Light Tones (168). Recently, Jewel, an American pop star particularly popular among teenage girls, toured Malaysia with Salem sponsorship. Of late, best-selling pop star and teen idol, Robbie Williams, expressed anger over his name being used to promote Benson & Hedges in Asia. His publicist noted, "Although Robbie smokes, he would never endorse tobacco. He smokes but is desperate to give it up (169)."

Another form of reaching youth and imprinting a brand logo on their consciousness has been the opening of music stores, such as the Salem Power Station in Kuala Lumpur (167). Obviously, the main customers for such a business are teens who leave the shop as a walking advertisement for the cigarette. For the past 5 years, the Philip Morris Group has sponsored the prestigious ASEAN Art Awards, which it credits with building links for cooperation between art communities in ASEAN and bringing art to the public in Southeast Asia (170). In 1994, an exhibition of finalists was held in Singapore, where the government gave Philip Morris special exemption to stage the event (171). A recent award ceremony was held in Hanoi, amid much fanfare and publicity. The Philip Morris Group has also donated $100,000 for the purchase of winning paintings from the contest that are kept in a permanent collection at the Singapore Art Museum (172).

It is important to note that the ASEAN art awards are viewed with some skepticism in select countries. Because of protest from anti-tobacco activists in Thailand, the event receives little coverage in the Thai media. Activists have discussed the difficulty of protesting this contest because, technically, Philip Morris is not in breach of Thailand's tobacco laws, and they do not want to appear "overzealous in the eyes of the public" (171). To do so might jeopardize the legitimacy of the position they have established in trying to staid off transnational tobacco companies from making further inroads into Thailand.

In 1999, Gay Pride activities in the Philippines benefitted from the sponsorship of Lucky Strike, which paid for the stage and the emcee and made its contribution to the event well-recognized. Some activists participating in the event were angered by the commercialization of the gathering and the selling out to big tobacco and have vowed not to allow tobacco sponsorship of such activities in the future (170).

Television and movies. In the Philippines, where television advertisements for cigarettes are still permitted, commercials for Winston cigarettes show young adult American men and women happily partying. The message states that these young people (and their cigarettes) represent the "Spirit of the USA," an image that further perpetuates the colonial mentality among young Filipinos (174). In Japan, television commercials for Lark cigarettes have featured popular Western actors, including James Coburn, Pierce Brosnan and Robert Wagner, starring in action vignettes (174).

India, which has the largest film industry in the world, produces more than 800 films per year. Observational data suggest that tobacco use is widespread in Indian films, although no formal studies have been done on this topic. Some popular actors are renowned for their individualistic smoking styles, and it is common for youth to attempt to emulate these styles in front of their friends. Increasingly, women in the developing world are being reached by satellite TV and the Internet, which have practically no restrictions on them. Even countries that have comprehensive advertising bans on tobacco products are vulnerable to tobacco shown in these media.

The impact of tobacco marketing on smoking behavior: United States and Asia

Individual behavior. Significant evidence exists on the relation between advertising and tobacco consumption, particularly in research conducted in the United States. One study looked at prevalence data from 1890 to 1997. The study found two historic periods of increases in smoking uptake among young women and not among young men, one from 1926 to 1939 and the other from 1968 to 1977. The first coincided with the early Chesterfield and Lucky Strike campaigns aimed at women, and the second followed the appearance of Virginia Slims and the proliferation of women's brands that began in 1967 (175, 176).

Studies in the United States provide evidence of the effect on advertising on youth smoking. A study of junior high school students that examined their exposure to tobacco advertising in magazines found that adolescents with high exposure to advertising were more likely to be smokers than were students with low exposure (177). A study that reviewed 20 years of cigarette advertising found that whenever the advertising of a brand increased, teen smoking of that brand was three times more likely than adult smoking to increase (178).

A longitudinal study in California of adolescents who had never smoked at the outset of the study provides evidence that advertising and promotional activities can influence them to start (179). Although having a favorite advertisement predicted progression to use from nonuse, willingness to use a promotional item more effectively predicted progression to use. The authors attributed 34 percent of smoking initiation to advertising and promotion. Another longitudinal analysis of California adolescent never-smokers determined that tobacco marketing was a stronger influence in encouraging adolescents to smoke than was exposure to peer or family smokers or demographic variables (180).

Other research has also shown a link between familiarity with advertising and brand preferences to smoking among adolescents in the United States (181-184). Owning promotional items or willingness to possess a promotional item has been strongly associated with smoking experimentation (179, 182, 185). In addition, two studies among youths in the United States found that the three most heavily advertised brands—Marlboro, Camel, and Newport—have substantially higher market penetration among adolescents than among adults (186, 187).

Research conducted after the introduction of Joe Camel revealed that children aged 6-11 years identified the Camel brand of cigarettes with the new cartoon camel and that children found these advertisements made smoking more appealing (188). After the introduction of Joe Camel, Camel cigarettes'share of the market under age 18 years increased almost 650 percent, from virtually nothing to almost one third of the market share, representing sales estimated at $476 million per year (188).

In Asia, studies also reveal the effects of cigarette advertising on smoking behavior. One study of 198 nursing students in Japan provided information on young women's contact with cigarette advertising and smoking behavior, with 95 percent of respondents reporting exposure to advertising (189). More than 50 percent of the students who had past/current smoking histories reported being "frequently" exposed to cigarette advertising via television and billboards, while 50 percent of the never-smokers reported only "occasional" exposure.

A study of college students from 12 universities in three cities in China looked at brand familiarity, recall of advertising, attitudes toward advertising, and cigarette use (190). Eight brands were most familiar, four foreign and four domestic. The leading brand was Marlboro. Chinese students were more likely to have seen advertising for foreign brands than for those that are domestic. Current smokers who reported having seen a Marlboro ad in the previous month were significantly more likely to prefer Marlboros.

Among adolescents aged 13-15 years in Hong Kong, perceiving advertisements for cigarettes as attractive was more strongly associated with smoking than were 13 other factors (adjusted OR = 2.68; OR = 2.62 in boys and 2.71 in girls) (191). Participation in a cigarette promotional activity was also positively related to use (adjusted OR = 1.24). Another study of more than 9,500

Hong Kong students aged 8-13 years found that ever-smokers were more successful in recognizing cigarette brand names and logos (adjusted OR = 1.67) (192). The two brands most successfully identified (95 percent) were Salem and Marlboro.

In a study of smoking in Vietnam, the country with the highest prevalence in the world (73 percent of males smoke) and where print, electronic, and outdoor advertising is banned, 38 percent recalled tobacco advertising (193). Of these, 71 percent recalled a non-Vietnamese brand as the brand advertised. Only 16 percent smoke non-Vietnamese cigarettes, although 38 percent would like to if they could afford it.

After the 1995 India-New Zealand cricket series, a survey was conducted among youths in Goa to determine the effect of sports sponsorship on tobacco experimentation. Findings reveal that despite a high level of knowledge about the adverse effects of tobacco, cricket sponsorship by tobacco companies increased the likelihood of experimentation among both boys and girls (194). A majority of those surveyed believed that cricket players smoked, and some expressed the opinion that smoking improved athletic performance, including batting and fielding. Among college students in South India, the notion that cigarette smoking increases concentration and helps one think is widespread (137).

Girls in both the developed and the developing world may be more vulnerable to advertisements than are young men. United States-based studies show that girls' sense of self-worth and perception of their appearance are lower than that of boys, fall with increasing age during adolescence, and are associated with regular smoking (195). Young women may also be more concerned than young men about what is socially acceptable, facing gender role conflicts different from those of their male peers (196, 197). Certainly, the developing world, with its much lower rates of smoking among women, is prime territory for targeted marketing that uses gender differences to create appeal. In addition to affecting individual behavior, cigarette marketing affects organizational behavior that influences women's preferences.

Behavior of women's magazines. Cigarette advertising appears to affect the coverage of the risks of smoking in magazines, especially women's magazines. A study of US magazines from 1959 to 1969 and 1973 to 1986 looked at the probability that magazines carrying cigarette advertisements would cover the risks of smoking (198). The probability of a magazine including an article addressing health risks of smoking was 11.9 percent if it did not carry cigarette advertising and 8.3 percent if it did. For women's magazines, the probabilities were 11.7 and 5 percent, respectively. An increase of 1 percent in the share of advertising revenue derived from cigarette ads decreased the probability of women's magazines covering the risks of smoking three times as much as in other magazines (198). Studies in Britain similarly found that magazines that accepted cigarette advertising were less likely to cover its health consequences (199).

A more recent study of 13 popular women's magazines from 1997 and 1998 noted that the ratio of cigarette advertisements to antismoking messages increased from 6:1 in 1997 to 11:1 in 1998 (200). There was a 54 percent decline in antismoking messages and a 13 percent decline in cigarette advertisements from 1997 to 1998. Articles about smoking made up 1 percent or less of all health-related articles. When tobacco was mentioned, it was often relegated to a mere reference. For example, a *Redbook* article on the top nine ways to prevent cancer mentioned quitting smoking in the introduction but did not list it as one of the "Top 9" (200).

Marketing of tobacco, then, affects both individual and organizational behavior. Individual women, novice and experienced tobacco users, receive and act on marketing messages transmitted through brand name, packaging, advertising and promotion strategies. Direct advertising revenues affect the coverage of health concerns about smoking in media, such as women's magazines. Sponsorships and the placement of tobacco within popular culture send additional signals that make tobacco use appear normal and reinforce the marketing messages of more direct forms of advertising and promotion. In some cases, such as sponsorship signage at televised motorsport racing events, these sponsorships provide advertising exposure that circumvents advertising bans. Sponsorship of organizations with which women and their families interact (e.g., the arts, museums and community fairs) associate tobacco with everyday life and the social fabric or infrastructure in which women live. Tobacco support for advocacy organizations and political leadership groups limits the involvement of these organizations in protecting the health of women.

RECOMMENDATIONS FOR ACTION

As discussed in this chapter, there is increasing evidence that the tobacco industry is focusing its efforts on the marketing of tobacco to women globally. The recommendations that follow, presented at the Kobe Conference on women and tobacco, address a growing need to establish and track the strategies of the marketing industry.

There is a need to establish a system for tracking globally the advertising, promotion, and other marketing strategies used by the industry to target women. Transnational tobacco companies use similar strategies at different times in different parts of the world. Additionally, domestic tobacco companies mimic the successful approaches of transnational tobacco companies. An early warning system could advise tobacco activists about strategies likely to be used, especially new developments, and global responses to these strategies could be devised. A central resource or clearinghouse with visual evidence and other documentation is needed, including Internet retrieval capacity.

A uniform, ongoing reporting of the acceptance of tobacco sponsorship funds to the public is needed, similar to the campaign financing reporting in the United States. Women who belong to affinity or advocacy groups should be aware of which of these organizations accept tobacco funding and at what levels. Minimally, all countries should require tobacco companies to file reports noting marketing expenditures, similar to the reports required by the US Federal Trade Commission, so that the global extent of these expenditures can be calculated and tracked.

Tobacco control activists need to increase and strengthen their outreach to organizations concerned with children's and women's rights to involve them in this fundamental rights issue. Nontraditional partners should be sought to organize women speaking out against predatory marketing practices. A global movement to find alternative sources of funding for women's organizations should be a priority. Corporate sponsors of women's products should be approached for this funding. A campaign to urge women's organizations to refrain from tobacco sponsorships should be launched, including written pledges and voluntary disclosure.

Tobacco advertising should be banned. The commercial use of registered brand name, logo, or trademark should be banned. Thus, no sponsorship or signage should be allowed to include a tobacco brand name, logo or color scheme associated with the brand. Promotional items should be limited to generic lettering (black or white) and should not be identified with the brand, but with the tobacco company (e.g., British American Tobacco, Philip Morris). Cigarette packaging should be in generic black and white lettering, with only the name, ingredients list, and appropriate health warnings. For example, the Canadian cigarette health warnings and their proposed new warnings should be models for other countries. The State of Massachusetts provides an additional model, with its requirement to list all ingredients on the package.

Motion pictures should include a rating component for tobacco exposure, and such a rating should be part of the overall rating given to a film (e.g., R-rating is now determined by the amount of violence, sex, and foul language in a film). Motion picture producers should be required to sign a certification that nothing of any value was exchanged for the appearance of tobacco products, signage, or other images or mentions of tobacco in each film, and a symbol of such certification should appear with the film credits.

Outreach to the television, recording, and motion picture industries should include education about the interrelation between popular culture messages about tobacco use and tobacco industry marketing. The tobacco control/health community should work with producers to provide accurate material for stories and ideas for stories that portray the real consequences of tobacco use. Media literacy skills that teach women and girls to analyze the messages of tobacco advertising and how the industry targets them are essential to protect women from these messages. Media literacy should be included in health education in schools and should also be provided by women's rights and service organizations. The World Health Organization regional offices should work to establish media literacy programs in every country.

The World Health Organization treaty on tobacco (international framework convention) should include agreements by nations to 1) ban advertising and promotion of tobacco; 2) require reporting by tobacco companies of any revenues spent on advertising, promotion, sponsorship, or product placement; and 3) require plain packaging of tobacco products, with all ingredients listed on the package.

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The Addiction Model

Janet Brigham

The health dangers and psychological consequences of tobacco addiction have long plagued women and youth in many societies (1). Scientists have identified tobacco as an addictive substance similar in its dependence-producing properties to "hard" drugs and alcohol (2, 3). Tobacco dependence, or addiction to tobacco, is presently a problem for many millions of women worldwide. Vulnerability to tobacco dependence is almost universal, based on the effects of nicotine on the brain and the rest of the body. This vulnerability is also familial and cultural and is heightened by tobacco's powerful reinforcing effects and by the nature of tobacco products, which in many cases are designed to be optimally addictive (2, 4). Governments are beginning to assume responsibility for controlling the spread of tobacco use among women and youth and to provide effective treatment for those already dependent on tobacco (5–7).

Rates of smoking among children under age 15, particularly girls, also have increased in many regions, reflecting a tendency of young persons to experiment with and become addicted to tobacco, typically before completing their first two decades of life (9). In addition, as awareness of tobacco's health risks spreads, persons who are less addicted to tobacco quit, leaving as smokers those with greater dependence on tobacco. Even though prevalence rates of tobacco use may be low in some countries where anti-tobacco measures and campaigns have helped reduce usage rates, continued tobacco users often are those who will have the most difficult time breaking their addiction to nicotine (10).

Tobacco use among women dates back hundreds of years. Berman and Gritz (9) summarized: "Tobacco use by women is not an innovation of modern times. Extensive cross-cultural evidence exists that women have smoked cigarettes, pipes, [and] cigars, and have dipped, chewed, snuffed, drunk, and licked tobacco in diverse cultures throughout history... Women have used tobacco products for magico-religious, medicinal, hygienic, and recreational purposes."

The use of tobacco among women and girls can be seen as part of a larger, longer-term pattern of reliance on substances of abuse for coping with daily life. Referring to Western culture, Kandall (1) explained:

> *During most of the second half of the nineteenth century, women addicted to opiates, as well as those who used cocaine, chloral hydrate, and cannabis, were generally tolerated in an atmosphere of silent acceptance. But many lived in the shadow of guilt and shame, concealing their drug use even from close family members. They maintained their drug habits either through self-medication with easily obtainable proprietary, or "patent," medicines or through the collusion of physicians and pharmacists, as overzealous, ignorant, or condescending as they were greedy. Women were medicated excessively not only for a wide range of organic complaints but also for a vague sense of non-organic complaints labeled "neurasthenia" or "nervous weakness."*

It was against this backdrop of unacknowledged but widespread drug acceptance that the modern cigarette, with its optimized capacity for addicting its users, rose to prominence (15, 16). Its accessibility and use spread around the world during the 20th century, to the extent that the cigarette is now the nicotine delivery device of choice in most countries.

TOBACCO PRODUCTS

Introduction

Two species of tobacco, *Nicotiana tabacum* (North America, Western Europe, and Africa) and *Nicotiana rustica* (South America, the former Soviet republics, Poland, India, and Turkey), are the primary sources of the tobacco manufactured and sold for cigarettes,

cigars, chewing tobacco, oral and nasal snuff, and pipe tobacco. Processed tobacco contains thousands of different chemical compounds (among them many known carcinogens), most of which are also present in green tobacco. The proportions of the numerous compounds, including nicotine, vary by type of product, e.g., cigarettes vs. oral snuff. Flavorings are added to cigarettes, snuff, and other tobacco products. The burning of tobacco generates even more compounds. The nicotine in tobacco is toxic, not only because its addictiveness leads to continued use of tobacco but also because nicotine itself is a potentially toxic substance (17, 18).

Distinct patterns of use and abstinence effects associated with tobacco use have been frequently observed and well documented. Such analyses have been far more common for cigarettes than for any other form of tobacco, even though both smokeless tobacco and cigars have increased in popularity in recent years, particularly in developed countries. In addition, the use of various forms of chewing tobacco is common in both developed and developing countries, but that usage has not been studied as thoroughly as has cigarette smoking. An upsurge in the use of smokeless tobacco in the United States during the 1980s has led to widespread use, largely among adolescents and young adults (19). Cigar use increased dramatically in the 1990s and has shown little indication of leveling off substantially (20).

The increase in use of these alternative forms of tobacco has been so recent, or so uncommon among more educated people in developed countries where research funding is available, that these phenomena remain understudied, although these forms of tobacco are widely used. In parallel with similar findings about cigarette smoking, research has established that smokeless tobacco use often involves tobacco dependence (19). This possibility has not yet been examined thoroughly, nor has cigar use, despite indications that cigar users can obtain high amounts of nicotine from cigars (20). For example, researchers have not yet systematically examined cigar usage patterns and abstinence effects and compared them with those associated with other forms of tobacco.

Nicotine is absorbed by the body in different ways, depending on the mode of delivery (17). Although the exposures and doses overlap considerably among nicotine-delivery devices, each form of nicotine delivery involves a distinct pattern of use, whether the nicotine is absorbed in a few seconds or gradually over a period of hours. Evidence suggests that the psychoactive effects of nicotine are related to its absorption and titration, which depend in turn on the nature of the delivery system. Over the centuries since tobacco first became widely available, humans have employed numerous means of consuming tobacco. Listed below are several of the most common delivery systems for tobacco; however, in some areas of the world the machine-made products are not in widespread use among persons of both sexes.

Cigarettes

A cigarette is a carefully designed nicotine delivery system that provides an amount of nicotine sufficient to establish and maintain dependence on tobacco (2). Although the modern cigarette was first manufactured in the middle of the 19th century and marketed on a broader scale at the beginning of the 20th century, widespread use was not common in the United Kingdom, Europe, Japan or the United States until World War I. The cigarette has undergone substantial changes in the last half of the 20th century (4).

Studies linking cigarette smoking with health risks provided the impetus for reductions in "tar" and nicotine yields in cigarette smoke. The use of filters occurred more quickly in Switzerland and Germany than in the United States. Although less than 1 percent of cigarettes had filters before 1950, by the early 1990s about 98 percent of cigarettes in the United States had filters. Filter tips have contained such constituents as foams, sponges, resins, paper, cotton, natural fibers like silk or flax, cellulose esters and ethers, carbon granules and powders, aluminum oxides and salicylates—as well as tobacco itself. The cellulose and carbon filters most commonly used at present sometimes contain laser-cut perforations that dilute the smoke stream, slow the velocity of air drawn through the cigarette and thus reduce carbon monoxide, nitrogen oxides, hydrogen cyanide and "tar" emissions. Nicotine emission, however, is not reduced as much as is "tar."

Nor is a cigarette simply tobacco wrapped in plain paper. Factors in the delivery of tobacco constituents are the combustion of the cigarette paper and its chemical treatments and porosity. Cigarettes generally contain reconstituted tobacco, also called "homogenized sheet tobacco," which is made from tobacco dust, fine particles, ribs and stems. Additives include sugars, humectants, aromatic substances, flavorings such as alfalfa extract or mandarin oil, and inorganic salts. Tobacco also can be "puffed," "expanded" and freeze-dried, with the result being less tobacco per cigarette. Smoke yield is related to the length and circumference of a cigarette, the relative fineness or coarseness of the shredded

tobacco, and the density of tobacco packing within the cigarette tube.

One variation of the cigarette is the Kretek, which contains about 30–40 percent cut cloves. The use of this product can result in dangerous bleeding resulting from dilation of blood vessels. The severity of illness from smoking Kreteks in the same way one would smoke non-clove cigarettes has been documented in case studies. Another form of cigarette that has attained popularity among youth in the United States is the "bidi," a small, brown, hand-rolled cigarette made in India and other Southeast Asian countries. It consists of tobacco wrapped in a leaf and infused with various fruit and confectionery flavors such as mango or chocolate (21). Toxicologic findings indicate that mainstream smoke from bidis (and from another form of tobacco called "chutta") is higher in nicotine than is smoke from US and Indian cigarettes (22). The health risks from bidis, as from other tobacco products, are substantial (23).

Not all tobacco-delivery devices are mass-manufactured. As cigarette taxes rise and fall, some individuals turn to rolling their own cigarettes, either by hand or with a small rolling machine, as a cost-saving effort. A 1998 report that identified parameters influencing smoke yields in self-rolled cigarettes also reported that more than 20 percent of UK smokers use roll-your-own products, accounting for some 3,050 tons sold in 1994 (24). Some evidence exists that hand-rolled cigarettes increase the risk of esophageal cancer, as well as cancer of the mouth, pharynx and larynx. Darrall and Figgins' laboratory experiment examining smoke yields in this type of cigarette showed that yields differed substantially between cigarettes (24). Elements contributing to variance were the porosity and chemical composition of the cigarette paper, the diameter and longitudinal packing profile of the cigarettes, and differences in smoking behavior among participants. The study found that tar yields, which were higher when the cigarettes were made in the laboratory, were above the regulatory limit of 15 mg per cigarette, and overall were higher than those from manufactured cigarettes. Nicotine yields also were higher in roll-your-own cigarettes.

Studies of smoking patterns over the life span show that smokers sometimes switch brands out of health concerns. Those who have smoked unfiltered cigarettes are known to switch to filtered ones, and those who have smoked "regular" strength cigarettes sometimes switch to "lighter" cigarettes out of concern for health consequences (25). However, their efforts may be in vain. Researchers have repeatedly found, over two decades, that when smokers switch to a lower-yield cigarette, they compensate by increasing their puff volume and otherwise changing their smoking parameters—e.g., by inhaling more deeply or holding the smoke in the lungs for a longer period of time. Benowitz et al. reported that smokers of low-yield cigarettes do not consume less nicotine than do other smokers (26). Recent research also has suggested that they may actually be increasing their health risk, since some forms of cancer are more common among persons who smoke lower-yield cigarettes.

Cigars

Similar to the rise of smokeless tobacco, there has been a rapid increase in the popularity of cigars in developed countries. Cigar use, marketed in the 1990s as a sign of luxury and sophistication, was adopted not only by men but also by women and young people. As cigar use increased among men in the early 1990s, it also increased among women, despite the historical trend for cigar use to be primarily a male practice (27). News reports indicate that the number of cigars sold annually in the United States rose from 100 million in 1992 to more than 2 billion in 1995. Premium cigar imports increased by 99 percent between 1996 and 1997 in the United States. Total US cigar consumption in 1996 was approximately 4.5 billion (28). Recent epidemiologic reports of cigar use among teenagers, including teenage girls, stated that 26.7 percent of US teenagers had smoked at least one cigar during the previous year, many of them during the previous month (29). The health risks of cigar use have been documented in the medical literature for more than 30 years in at least 200 studies (30, 31).

Cigar users are exposed to nicotine both by puffing on lit cigars and by holding unlit cigars in their mouths. Cigars typically are smoked and held in the mouth, allowing extended oral absorption of nicotine (31). Although some cigar users report not inhaling smoke directly from the cigar, they may still have considerable exposure to environmental or sidestream smoke (32). Therefore, cigar smoking could involve behavioral and dosing elements of both cigarette smoking and smokeless tobacco use, leading to speculation that possible dependence patterns and abstinence effects could resemble those associated with both of these other forms of tobacco use.

Exactly how much nicotine an individual might obtain from a single cigar is difficult to determine or generalize about, since cigar weight and nicotine content vary widely from brand to brand and from cigar to cigar. Most cigars range in weight from about 1 g to 22 g; a

typical cigarette weighs less than 1 g. Nicotine content in 10 commercially available cigars studied in 1996 ranged from 10 mg to 444 mg. Henningfield et al., relating these data, indicated that it is possible for one large cigar to contain as much tobacco as an entire pack of cigarettes (31). Thus, they summarized that smoking "a few fat cigars" could result in the same smoke exposure as consumption of a pack of cigarettes. They concluded that an individual cigar smoker might exceed a typical cigarette smoker in intake of nicotine and other toxins. Nicotine yield varies with cigar pH, and pH in turn varies from cigar to cigar, and even varies from the beginning of smoking a single cigar to the end. Nonetheless, a cigar smoker can obtain enough nicotine from even one cigar per day to become dependent on nicotine (33).

> It is possible for one large cigar to contain as much tobacco as an entire pack of cigarettes. An individual cigar smoker might exceed a typical cigarette smoker in intake of nicotine and other toxins.

A cigar's nicotine concentration ranges from approximately 5 mg per g of tobacco to 22 mg/g. Cigar pH ranges from about 6 to more than 8; cigarette pH is 5.5–6.5. An alkaline product results in harsher smoke than a less alkaline cigar. In addition, cigars with higher pH deliver nicotine more efficiently than do cigars that might actually contain more nicotine. The size of a cigar does not necessarily relate to nicotine content, since nicotine content varies among cigars. Cigar smokers'inhalation and puffing style also varies, with some cigar smokers inhaling cigar smoke, others inadvertently inhaling sidestream smoke, and some not lighting up but absorbing nicotine through the unlit cigar. Former cigarette smokers or mixed smokers of both cigars and cigarettes tend to inhale more deeply than those who have smoked only cigars (34).

Cigars differ from cigarettes in size and construction. Cigars are wrapped in tobacco leaves or in paper soaked with tobacco extract. Large, expensive premium cigars are hand-rolled, although machine-made cigars are produced somewhat similarly to the way cigarettes are produced. The delivery of nicotine varies from one end of the cigar to the other end, and nicotine content varies from puff to puff. Cigar tobacco is higher in nitrates than is cigarette tobacco; nitrates have been found to be carcinogenic. A 1998 monograph published by the US National Cancer Institute (20) provides a thorough overview of cigar usage and health risks.

Perhaps more than other types of tobacco, cigar use has come to reflect a somewhat singular image of success, satisfaction, and luxury across many cultures and nations. The rises and falls in cigar use in the United States present a graphic examination of how tobacco use can be influenced by public perceptions and marketing images. When the modern blended cigarette was introduced and marketed on a wide scale around 1900, a rise in cigar sales plateaued. When the Great Depression sent the United States into economic chaos and lethargy in the late 1920s and early 1930s, cigar use plummeted. Cigar use rose steadily as the economy recovered, and peaked with the television advertising of small cigars. When advertising of such cigars on television was banned, sales dropped dramatically; then, when cigar magazines began to be published in the early 1990s, sales again increased rapidly. This link between cigar consumption and images of prosperity has lured many cigar users into inaccurate assurances that their health is not in danger if they do not inhale cigar smoke. In fact, it is not uncommon for cigar smokers to fail to identify themselves as smokers at all. However, the late-life lung cancer death rates for persons who smoke about five cigars per day and inhale moderately approximates the lung cancer death rates for cigarette smokers who start smoking at age 18 and smoke one pack a day throughout their lives. Lung cancer death rates among cigar users who do not inhale cigar smoke are higher than rates for persons who never smoke (20).

Smokeless tobacco

Although a considerable amount of scientific and medical research has examined cigarette smoking, far less investigation has been conducted on the use of smokeless tobacco, which in some countries has emerged as a major health concern in the last decade. Contrary to notions popular in the United States, various forms of smokeless tobacco are used widely in some countries by women as well as men, and by children as well as adults. The paucity of research reflects the recent upsurge in smokeless tobacco use in some developed countries but is unrelated to the significant health risks posed by smokeless tobacco (19, 35, 36). Despite its many known health risks, use of smokeless tobacco has increased dramatically over the last decade among many segments of the world's population (37). In 1995, approximately 25 percent of white high school males

across the United States reported regular use of smokeless tobacco (38). Smokeless tobacco is often used by individuals who also smoke cigarettes. Nicotine blood levels from daily smokeless tobacco use approximate those of daily cigarette use (39). Convincing evidence exists that smokeless tobacco is addictive (37, 40). Because interest in smokeless tobacco is recent in some countries where tobacco research is conducted on a broad scale, research specific to smokeless tobacco is only now being undertaken to any major extent. Thus, like cigar use, it remains an understudied practice.

Therefore, while the prevalence of cigarette smoking (the most common nicotine-delivery system) has stabilized or decreased in many demographic groups in recent years, the use of smokeless tobacco has increased in some regions (41). For example, in the United States, smokeless tobacco use has been on the rise for more than a decade, particularly among teenagers and young adults of both sexes. The expansion mostly represents increased consumption of moist oral snuff (41, 42). While the use of smokeless tobacco products has risen, information available to the public about smokeless tobacco has not kept pace, perhaps because of an incorrect public notion that smokeless tobacco use is an outdated practice or a practice with negligible health risk. As a result, differences between the profiles of smoking and smokeless tobacco dependence have only recently been examined (43–45), and specific biochemical markers of smokeless tobacco use have only recently been identified (46, 47). Psychophysiologic effects of smokeless tobacco have not yet been assessed comprehensively, although in a growing body of work (48), several nicotine researchers have pursued significant threads in a systematic psychophysiologic characterization of tobacco use, starting with smoking.

It would be inaccurate and scientifically inappropriate to assume that findings from the considerable research literature on cigarette smoking can be applied directly to smokeless tobacco use, or to cigars or other forms of tobacco. Different routes of administration of nicotine are believed to result in different psychoactive effects; consequently, researchers and clinicians cannot assume that findings about cigarettes also apply to smokeless tobacco. Without research efforts paralleling those dedicated to studying cigarette smoking, smokeless tobacco prevention and treatment initiatives will be developed in an information vacuum. This could greatly diminish the effectiveness and utility of these programs. Some investigations of smokeless tobacco use have studied usage patterns, cardiovascular effects, metabolism and abstinence. However, many other important issues are as yet uninvestigated. Until such areas as cognitive and arousal effects are examined with regard to smokeless tobacco, efforts at prevention and treatment will be limited.

Nicotine dependence is associated with use of smokeless tobacco. Evidence indicates that nicotine dependence results from regular use, as is the case with other nicotine delivery systems (37, 40, 49, 50). Nonetheless, abstinence symptoms associated with smokeless tobacco-related nicotine dependence are fewer in number and lesser in severity than those experienced by dependent cigarette smokers. Symptoms of abstinence in daily users of smokeless tobacco include decreased heart rate, increased eating, increased craving for tobacco, difficulty concentrating, and increased reaction time in performance tasks. Abstinent smokeless tobacco users do not experience the irritability or anxiety common in cigarette withdrawal. Another difference between smokeless tobacco and cigarette abstinence effects is that no dose effects have been detected in nicotine polacrilex (gum) replacement treatment of abstinent smokeless tobacco users (49). The aggregate of these findings indicates that daily smokeless tobacco use results in nicotine dependence that differs from dependence on cigarettes both in abstinence symptoms and in appropriate treatment. The ways in which this particular form of dependence influences the extent of exposure and mediates psychiatric, personality and cognitive factors have not yet been identified.

Many environmental influences are believed to be associated with smokeless tobacco use. These are particularly of interest in relation to use among women and youth. Although smokeless tobacco use in developed countries often is more common among boys and men, use in areas with large Native American populations has been noted to be as high as 69 percent among adolescent females, compared with 79 percent for adolescent males (51).

Factors contributing to smokeless tobacco use in both sexes are similar to those affecting use of other types of tobacco, although attitudes about smokeless tobacco and influences leading to its use vary by region and by other demographic factors. Some researchers have found that parental tobacco use and attitudes influence smokeless tobacco use in offspring (50, 52, 53). Peer influences also have been found to be significant in a number of studies (54–57). Ary reported that peer use of smokeless tobacco was the best predictor of continued daily use (58). The roles of these numerous factors in continued use are only now being explored.

NICOTINE

A naturally liquid alkaloid, nicotine is conveyed into the body through tobacco smoke and is readily absorbed through the lungs, skin and mucous membranes. Absorption through the lungs is a favored route of administration, since pulmonary absorption can yield noticeable effects in a matter of seconds. Nicotine stimulates nicotinic acetylcholine receptors localized peripherally at autonomic ganglia, including the adrenal medulla and the chemoreceptors of carotid bodies and the aortic body. Additionally, nicotine stimulates nicotinic acetylcholine receptors at cholinergic synapses in the brain and spine. Because of the interactions between nicotine and neuronal high-affinity nicotinic acetylcholine receptors, nicotine affects learning, memory and other functions.

Pharmacology

Smoked cigarette tobacco is absorbed mostly through the alveolar surface of the lungs. Because of the acidic pH of cigarette smoke, nicotine is ionized in smoke and is not absorbed to a significant extent through the mucous membranes of the mouth. The more alkaline smoke of cigars is absorbed through the oral mucous membranes. From the lungs, the chemicals in smoke are absorbed into the body's systems and carried quickly to different parts of the body (2). Non-smoked forms of tobacco, such as oral snuff, are absorbed more gradually (59, 60). Factors that determine the extent of tobacco exposure are the length and number of puffs of a cigarette, the intensity and depth of inhalation, the mixture of air and smoke, and the amount of available smoke. The amount of nicotine intake from one cigarette can vary widely, in accordance with the smoker's latitude for adjusting the dose level. Benowitz and Jacob, for example, found that nicotine intake ranged from 10 mg/day to 80 mg/day, or 0.4–1.6 mg per cigarette (61). The controllability of inhaled tobacco smoke allows the smoker to make precise dose adjustments, even if this process is not consciously carried out.

Once absorbed, nicotine travels rapidly to the brain, requiring only a matter of seconds. Thus, the psychoactive rewards associated with smoking occur quickly and are highly reinforced. Drugs are considered to be most reinforcing when a psychoactive effect quickly follows administration of the drug. Nicotine binds to receptors in the brain, where it influences cerebral metabolism. Nicotine is then distributed throughout the body, mostly to skeletal muscles.

A more thorough understanding of nicotine's distribution in the body and its psychopharmacology has helped move definitions of tobacco use from the outdated concept of "habit" to the current concept of "nicotine dependence," a term describing an addiction to a substance. Nicotine's actions on the brain and the rest of the body, and consequently its behavioral and physiologic effects, are complex. Describing them in full is well beyond the scope of this paper, particularly since these many effects depend on the size of the dose, the time span following administration of nicotine, and prior exposure to nicotine, as well as on various other factors. Additionally, nicotine is by no means the only substance in tobacco; except in studies of nicotine delivery alone, it is not safe to assume that nicotine is the only psychoactive substance in tobacco.

Nicotine's cardiovascular and neurotransmitter effects do not follow a positive linear dose-response pattern. A high dose of nicotine, therefore, is not necessarily proportionally more toxic than a low dose, and a low dose can be associated with adverse effects. The intensity of nicotine's effects depends on the rate of delivery. This is why the rapid delivery of nicotine through cigarettes is desirable to smokers, because it results in higher arterial levels of nicotine (62).

Nicotine administration elicits what is termed a "biphasic response" in humans as well as in the laboratory. In the human body, low doses of nicotine produce an arousal response, with heightened vigilance and attention. Smokers can adjust the speed with which nicotine is delivered to the brain and thus can adjust the psychological effect. The extent of the dose interacts with the rate of delivery and the preexisting baseline condition to determine the overall magnitude and direction of the nicotine's effects. A cigarette smoker controls the dose and delivery rate of nicotine with each puff; consequently, it is not sufficient merely to count puffs when determining nicotine exposure. Rather, the volume of each puff, the depth to which the smoke is inhaled, and the rate and intensity of puffing are all aspects of "smoking topography" that must be analyzed in order to accurately characterize the way nicotine is taken into the body through cigarette smoke. An additional factor complicating an understanding of smoking topography is that smoke intake is also related to whether smokers of cigarettes with ventilation holes cover those holes while smoking. All of these factors determining the intake of smoke, and with it the nicotine dose (17, 63, 64).

As is the case with other drugs of abuse, nicotine's reinforcing properties relate at least in part to its activation of the brain's mesolimbic dopamine system, particularly in the nucleus accumbens. This area of the brain is also important in the development of dependence or addic-

tion. Nicotine increases "burst" activity (rapid sequential electrochemical spikes, as measured electrophysiologically) in the ventral tegmental area of the brain, a region of the brain that is significant in nicotine's physiologic impact on motivation, learning, and cognition. These bursts trigger a massive release of dopamine, as high as six times the baseline level. The consequent changes in electrochemical brain activity are seen in attention and reward systems; thus, nicotine mirrors the reward response of the mesolimbic dopamine system. As Corrigall et al. have reported, infusion of a nicotine antagonist into the ventral tegmental area decreases nicotine self-administration (65). Nisell et al. summarized:

> *The more long-lasting effect of nicotine administered in the ventral tegmental area thus indicates that nicotinic receptors in this region are more significant than those located in the nucleus accumbens for mediating the stimulant effect of systemically administered nicotine on accumbal dopamine release. Taken together, these results support the notion that modulation of burst activity in mesolimbic dopamine neurones, executed at the somatodendritic level, represents the critical mechanism for the increased mesolimbic dopamine release and nicotine's rewarding action. (66)*

Nicotine's reinforcing action is believed to be caused by its stimulation of the function of dopaminergic systems of the brain that include the mesolimbic, nucleus accumbens and nigro-striatal systems. Nicotine induces the release of several central nervous system neurotransmitters through direct receptor-mediated action on nerve terminals. Chronic administration of nicotine can result in increased density of nicotinic acetylcholine receptors in the brain, which occurs before measurable tolerance is developed (67). Nicotinic acetylcholine receptors are associated with the reinforcing properties of nicotine because of their mediation of nicotine-induced effects in the brain's reward system. Chronic exposure to nicotine results in changes in at least one subtype of nicotinic acetylcholine receptors (68). Balfour and Fagerström explain how chronic exposure to nicotine sensitizes the pathway that mediates the rewarding, euphoria-producing properties of nicotine (69). Additionally, the peripheral actions of nicotine are important in its capacity to mediate the immediate subjective effects of smoking (70). Nicotine also apparently interacts with specific serotonin receptor sites, in that smoking is linked with site-specific changes in serotonin concentrations, although it is unclear whether serotonin is involved in the behavioral and pharmacologic actions of nicotine (71).

Nicotine's withdrawal effects appear to be related to activity in the ventral tegmental area of the brain. When nicotine-dependent rats are administered a nicotine antagonist that blocks the effects of nicotine in that area of the brain, they experience the rat version of nicotine withdrawal—specifically, their teeth chatter; they gasp; they yawn; their locomotion slows; and less dopamine is released in the nucleus accumbens of their brains. Withdrawal is also accompanied by diminished extracellular levels of dopamine and its metabolites (72).

When nicotine-dependent rats are administered a nicotine antagonist they experience the rat version of nicotine withdrawal—specifically, their teeth chatter; they gasp; they yawn; their locomotion slows; and less dopamine is released.

The effects of nicotine in the brain are believed to be caused by stimulation of nicotinic cholinoceptors, as happens with nicotine's effects on dopamine secretion in the mesolimbic dopaminergic system. Gamma-aminobutyric acid modulates dopaminergic transmission within the nucleus accumbens. Chronic administration of nicotine can result in up-regulation of the receptors, and the density of nicotinic receptors increases in persons who chronically use nicotine. Smoking results in increased platelet serotonin receptor density, with increased binding of fibrinogen receptors (73). Nicotine dependence, however, evidently is not necessarily related to stimulation of the mesolimbic dopaminergic system (74). As Balfour explained, "It is possible... that each smoker adjusts the way in which they smoke so that he/she achieves the appropriate combination of nicotinic receptor stimulation and desensitization which they find most rewarding." In addition, Balfour suggested that since desensitization of nicotinic receptors in the brain occurs among persons who smoke, this process could contribute to the addictive quality of nicotine (74).

Considerable evidence exists that the psychoactive effects of nicotine are related to its absorption and titration, which depend to a great extent on the nature of the delivery system. Research on nicotine titration has suggested that smokers vary nicotine levels, and presumably also vary the psychoactive impact of nicotine, by varying the intensity and rapidity of their inhalation of tobacco smoke (75, 76). This line of research also has

illuminated nicotine titration differences among smoking, smokeless tobacco use, and chewing of polacrilex gum. These differences in titration and, consequently, in blood levels also have been identified in smokeless tobacco products, including oral snuff and chewing tobacco (59, 60).

Nicotine's electrophysiologic effects on the brain have been studied for several decades. With refined methodology, expanded electrode arrays, and computerized depiction of brain activation, a fuller picture of nicotine's presumed cortical effects has emerged. A synthesis of recent research indicates that nicotine has relatively localized and lateralized effects on the brain (64) and that it affects the central nervous system at large. During stressful or high-arousal conditions, nicotine appears to reduce right-hemisphere processing and activation in a pattern consistent with the modulation of affect, or emotion. In low-stress, relaxing situations, nicotine may activate right-hemisphere processing more than left-hemisphere processing. Nicotine appears to activate the left hemisphere more than the right in highly engaging vigilance tasks (77). The laterality of nicotine's effects is thus believed to vary by situation (78), as well as to be affected by a variety of behaviors and personality traits. As Gilbert summarized, "Smoking-sized doses of nicotine appear to facilitate goal achievement and performance and to minimize negative-affect-related electrocortical activity" (64).

Recent evidence indicates that specific elements of the striatopallidal and extended amygdala systems may mediate the acute reinforcing action of nicotine (79). Chronic use results in dysregulation of the brain's reward system, characterized by decreased reward function. Withdrawal raises the threshold for reward. Decreases in dopamine and serotonin neurotransmission in the nucleus accumbens and increases in corticotropin-releasing factor (brain-stress neurotransmitter) could mediate such changes. These factors may help explain the compulsive seeking and self-administration of nicotine. Recent investigation in rats has shown that nicotine increases the release of stress-induced serotonin through the stimulation of nicotinic acetylcholine receptors (80). The nicotinic acetylcholine receptors are part of the group of neurotransmitter-gated ion channels responsible for rapid communication between cells. Nicotinic cholinergic receptors also have diverse subunit structures, functions and distributions within the nervous system (63).

Nicotine affects much more than brain functions related to concentration, alertness, arousal, etc. Nicotine's half-life of 2–4 hours keeps nicotine present and active for approximately 6–8 hours in a typical tobacco user. Nicotine acts on the sympathetic nervous system, resulting in constriction of some blood vessels, an increased heart rate, a moderate increase in blood pressure, and an increase in myocardial contractility. Nicotine increases the heart's workload while constricting coronary blood vessels, a condition that can presage ischemic events. Chronic exposure to nicotine results in the development of tolerance to nicotine's cardiovascular effects, but such tolerance is never sufficiently complete, thus allowing cardiovascular damage to occur even with the development of tolerance.

Nicotine administration has a demonstrable effect on human and non-human performance of cognitive tasks. Nicotine agonists also can facilitate performance. Nicotine appears to influence working memory, though not necessarily other types of memory. Unlike other effects of nicotine, memory improvement does not exhibit any signs of tolerance. Nicotine facilitates synaptic activity in the hippocampus of the brain, long known as an important structure associated with memory functions. Additionally, nicotine interacts with at least several neurotransmitter systems that constitute the neural basis of cognition. Nicotine induces the release of various neurotransmitters, including acetylcholine, dopamine, serotonin, norepinephrine and glutamate, and may have some association with other systems, including the aminobutyric acid, opioid and histaminergic systems (81).

It is well established that nicotine is the primary psychoactive component of tobacco, and that nicotine inhaled through cigarette smoke results in cortical arousal. Smokers have reported smoking to alleviate feelings of tiredness and to heighten alertness and relieve stress. Smoking evidently can simultaneously relieve stress and create feelings of arousal in separate and independent ways (82), which are dependent in part on the degree of nicotine deprivation (83). Parrott explains:

> *[T]he relaxant properties of smoking reflect the relief of irritability which develops between cigarettes. The deleterious mood effects of abstinence explain why smokers suffer more daily stress than non-smokers, and become less stressed when they quit smoking. Deprivation reversal also explains... arousal..., with deprived smokers being less vigilant and less alert than non-deprived smokers or non-smokers. Nicotine can, however, display genuine stimulant properties, although due to repeated abstinence effects the aver-*

age arousal level of smokers is generally similar to non-smokers. Mood normalization also explains why nicotine is so addictive, with regular smokers needing nicotine just to "function" normally. The power of nicotine to produce such marked changes in psychological state accounts in part for its addictive nature (83).

Accounts of the natural history and course of tobacco use make it evident that tobacco is often used in conjunction with other substances. The interactions function on many levels, influencing the effects of tobacco use on health risks, medical treatments, and metabolism of other substances. Consequently, tobacco use should be assessed and considered when medical treatment is undertaken, and tobacco smoking should be considered in clinical trials of drugs. Drugs whose effects can be altered by nicotine include theophylline, caffeine, tacrine, imipramine, haloperidol, pentazocine, propranolol, flecainide, estradiol, heparin, insulin, s-blockers, benzodiazepines, ethanol and opioids (84).

Dependence

While some people believe that they have an inherent tendency to become addicted to psychoactive substances, no evidence exists that a general tendency to become addicted exists or that a phenomenon such as an "addictive personality" has any basis in fact, despite research efforts to demonstrate such an effect. Some proportion of the general population may have a biologic vulnerability that predisposes them toward substance abuse. This vulnerability may have a familial component, which may be determined in part by genetics. Merikangas et al. found that there was an eightfold increase in risk for drug use disorders among persons whose relatives had substance disorders involving opioids, cocaine, cannabis, or alcohol (85). However, the path toward addiction to substances, including nicotine, is not predetermined, and addiction is generally believed to require a combination of environmental factors, familial influences, biologic vulnerability and exercise of free will.

Several slightly varying sets of criteria are typically used to diagnose addiction, also referred to as "substance dependence." Drug addiction was first studied in relation to opiate use and was characterized primarily by the withdrawal symptoms accompanying abstinence from opiates following chronic use. As a result, addiction often has been viewed in terms of withdrawal, and physical dependence has been seen as "a central defining characteristic" (86). More recently, international experts have reanalyzed the symptoms that circumscribe addiction, resulting in the World Health Organization's application and recommendation of the term "drug dependence." Cohen et al. interpreted the definition of the term: "Drug dependence is a state, psychic and sometimes also physical, resulting from the interaction between a living organism and a drug, characterized by behavioral and other responses that always include a compulsion to take the drug on a continuous or periodic basis in order to experience its psychic effects, and sometimes to avoid the discomfort of its absence. Tolerance may or may not be present" (86).

As groups such as the American Psychiatric Association and the World Health Organization have refined their definitions of drug dependence, they have issued criteria with specific behavioral and physiologic identifiers that can be used as diagnostic criteria. The various sets of criteria change slightly as succeeding versions of the diagnostic categories are issued, reflecting growth in scientific understanding of addiction and in societal comprehension of its impact. One comprehensive definition of addiction comes from a report (87) issued to the Royal Society of Canada and to Health and Welfare Canada. In this report, drug addiction is defined as "a strongly established pattern of behaviour characterized by 1) the repeated self-administration of a drug in amounts which reliably produce reinforcing psychoactive effects and 2) great difficulty in achieving voluntary long-term cessation of such use, even when the user is strongly motivated to stop."

Often present in definitions of dependence or addiction are the following elements:

- Tolerance: the need for increasing doses of a substance to achieve a desired effect.
- Withdrawal symptoms: these symptoms range from mild to severe, and vary in duration from substance to substance.
- Using more of the substance than intended, or using it for a longer period of time than intended.
- Persistent desire for use, or unsuccessful efforts to cut down or control use.
- Spending time or resources obtaining a substance or recovering from its use.
- Psychoactive effects.
- Drug-reinforced behavior: "reinforcement" refers to the quality of being able to get users to do something repeatedly, such as consume tobacco repeatedly.

At this point in the evolution of substance dependence research, most experts in substance abuse no longer list intoxication as a necessary aspect of addiction, since many substances of abuse produce no intoxication.

Tobacco use has been a challenging behavior to describe etiologically, psychologically and behaviorally. Gilbert and Gilbert (64, 88) have argued for a more complex approach to nicotine use than is typically utilized in research protocols (2, 89). They also have recommended more intensive examination of psychosocial and personality variables related to patterns of nicotine use. Not only do tobacco use and dependence co-occur with psychiatric morbidity (90, 91) but nicotine use frequently accompanies the use of other substances (92). Ary (58) estimated that at least 20 percent of smokeless tobacco users also use cigarettes; this figure is probably quite low. Findings indicate that tobacco use often is not an isolated phenomenon. Rather, it occurs as part of a more general pattern of substance use that may include several forms of tobacco, as well as alcohol and marijuana. Tobacco users report a variety of reasons for use (44, 93). The interactive effects of nicotine and other substances of use and abuse are only now being examined in such work as the report by Pritchard et al. (48) on the subjective, performance-related and psychophysiologic effects of caffeine use and smoking.

Researchers have found that nicotine is the primary pharmacologic factor that influences and reinforces all tobacco-use behavior. Nicotine appears to generate dependence by producing centrally mediated reinforcing effects, by regulating elements such as body weight and mood in ways that are perceived as useful or desirable by the tobacco user and by leading to a physical dependence such that abstinence may result in adverse symptoms (2). Tobacco products manufactured and sold throughout the world are optimally designed to be addictive and to undermine the best efforts of persons who want to quit using them (2, 94). Most tobacco users find that they cannot simply stop using tobacco but must overcome their addiction to nicotine and the well-reinforced behaviors associated with tobacco use. Those tobacco users who quit without the use of medications or behavioral help tend to remain abstinent for only a few days. Those who smoke occasionally or smoke a small amount on a daily basis are more successful at quitting than are regular smokers (95, 96).

Withdrawal

As with other drugs of abuse, cessation of tobacco consumption after long-term use usually results in withdrawal symptoms (97). Reduced exposure to nicotine, whether from total abstinence or from merely cutting back on tobacco consumption, results in a constellation of symptoms that vary considerably among individuals but usually involve marked effects. Symptoms typically include anxiety, irritability, difficulty concentrating, impatience, dizziness, insomnia or other sleep disturbances, headaches, digestive disturbances, depression, nicotine cravings, heart palpitations, sweating, tremors, hunger and restlessness.

The immediate symptoms of nicotine withdrawal begin within 6–12 hours after the last use of tobacco (98). The symptoms are most severe during the first to third days of abstinence. Symptoms and effects of abstinence from nicotine often peak within 1–2 weeks and persist for as long as 3 or 4 weeks. More than 40 percent of smokers who quit using tobacco report experiencing withdrawal symptoms for more than 4 weeks. It is typical for symptoms to change over the course of time, with some symptoms replacing others that were less prominent at the onset of abstinence.

During nicotine withdrawal, these symptoms can be controlled through the use of nicotine replacement medications and through careful planning and management of the quitting process (6, 7). Overall, tobacco abstinence in nicotine-dependent smokers generally entails experiencing a substantial number of withdrawal symptoms, some of which have the potential to adversely affect occupational and social functioning (99). A sizable proportion of tobacco users routinely achieves some cognitive or affective stabilization or enhancement through exposure to nicotine (64); these effects diminish as tobacco exposure is reduced. It may take at least several weeks for some former users to attain cognitive and affective stasis in the absence of nicotine.

Thus, a tobacco user who attempts to quit without substantial nicotine replacement (which should be tapered off over a period of approximately 3 months) is likely not only to experience abstinence symptoms but also to lose the stabilizing and enhancing effects of nicotine. Additionally, evidence indicates that nicotine-dependent smokers metabolize certain other substances, including caffeine and alcohol, differently for a period of time after initial cessation (100). The possibility of toxicity from other substances adds to the potential for temporarily impaired cognitive, affective, and performance-related functioning.

Withdrawal or abstinence symptoms associated with tobacco dependence increase occupational accident risk, as indicated in a recent report by Waters et al. (101). Within a few hours of abstaining from tobacco, regular smokers experience deterioration in mood and cognitive performance (102, 103). Waters et al. examined reports of nonfatal accidents at work, comparing data from England's national No Smoking Day, which is the sec-

ond Wednesday in March, with data from other days (101). They assumed that more people in the working population would suffer from nicotine withdrawal on No Smoking Day than on the Wednesdays before and after that day; they also assumed that the deterioration in function resulting from nicotine withdrawal would cause an increased chance of work-related accidents. Findings from 10 years of No Smoking Day data indicated that accidents did increase on No Smoking Day. Thus, smokers are at elevated accident risk if they continue to smoke (104), yet they are likely to increase their accident risk while trying to quit smoking. However, both workers and management may be unaware of the occupational hazards associated with nicotine withdrawal, which can also relate to withdrawal-induced alterations in cognition and performance (105, 106). The authors of the No Smoking Day accident study (101) stressed that an increase in accidents was not a reason to continue smoking. Rather, they recommended wider use of nicotine replacement, because it curbs the effects of nicotine withdrawal.

The ability of nicotine administration to reverse performance deficits in nicotine-deprived, tobacco-dependent smokers has been known for decades (106, 107). Heimstra et al. first demonstrated these effects on driving performance in a study showing that smokers who were allowed free access to cigarettes performed significantly better on driving simulation tasks than did smokers who were deprived of cigarettes (108). Specifically, deprived smokers demonstrated decreased efficiency in reaction time and overall vigilance. Similar results were reported by Frankenhaeuser et al. (109), who observed smokers in monotonous tasks and situations, and by Keenan et al. (110) in relation to the effects of smokeless tobacco deprivation on performance. The 1996 official recommendations of the US Agency for Health Care Policy and Research guideline "Smoking Cessation" (5), the 2000 update in a report to the US Surgeon General (6), and the British "Smoking Cessation Guidelines for Health Professionals" (7) specify nicotine replacement therapy for the most effective treatment and alleviation of withdrawal symptoms. Henningfield confirmed the efficacy of nicotine replacement for all smokers who use more than 10 cigarettes per day (111). Although the recommended levels of nicotine replacement generally give former smokers less nicotine than they obtained while smoking, the amount is sufficient to reduce abstinence effects to a more manageable level.

TREATMENT

Reducing worldwide exposure to tobacco could dramatically reduce mortality from tobacco-related causes, even within a few years (112). Nearly 2 million fewer smokers would die annually by the year 2010 if both treatment and tobacco-control measures were instituted and made available. Some 4 million lives would be saved annually by the year 2025 following the same course of control and treatment. More than half of the cumulative premature deaths from tobacco could be prevented by the year 2050, saving approximately 12 million lives (113). However, treatment is not available on a wide scale, even in many developed countries. In some countries, it is available through workplace benefits, but this also makes it preferentially available to men rather than women, since men constitute a larger portion of the workforce. Recent evidence also indicates that physicians, who are a primary line of defense in tobacco dependence treatment, are inadequately trained for this task (114). Historically, only about 2.5 percent of persons who attempt to quit smoking without assistance succeed (115, 116). The addition of behavioral treatments and medications (prescription and nonprescription) increases a smoker's likelihood of long-term abstinence (7, 117).

At least two national government groups and a number of professional organizations have published guidelines and recommendations for helping tobacco users quit, including the 2000 report "Treating Tobacco Use and Dependence" from the US Surgeon General (6) and the British publication "Smoking Cessation Guidelines for Health Professionals" (7), a landmark document published along with information on the cost-effectiveness of treatment. Professional groups such as the American Psychological Association (118) also have published professional guidelines. This movement, representing efforts toward encouraging professionals to take an active part in helping patients and clients stop using tobacco, is building momentum and shows no indication of slowing. Recommendations from these groups are compatible, reflecting the statistical synthesis of many hundreds of clinical studies that have examined the efficacy of various methods of quitting tobacco use. Those treatments that have been endorsed to date include offering brief advice on quitting, providing behavioral therapy, providing nicotine replacement and supplying the prescription medication bupropion. Providers of primary medical care, as well as those working with them, are being instructed to assess the tobacco-use status of patients at every visit, to advise tobacco users to stop using tobacco and to help them in

doing so. Also important are follow-up contact and referrals to specialists as needed. Teams of caregivers are advised to recommend pharmacotherapy and information for all tobacco users who would like to quit.

The use of medications is a relatively recent component of treatment for tobacco dependence. Nicotine replacement, delivered most commonly through oral or transdermal routes, has been examined in terms of its bottom-line cost-effectiveness, because of the reality that costs for a medication will be underwritten only if it can be proven to be a cost-effective intervention. A 1999 report indicated that the cost per year of lives saved makes tobacco dependence treatment cost-effective for general medical practitioners (119). Consequently, they recommended that providing transdermal nicotine patches and providing other treatment should be extended into medical practice as a way to reduce both tobacco use and tobacco-related disease. This recommendation would extend British government recommendations specifying specialist clinics to which tobacco users could be referred for treatment; thus, it underscores the utility of involving a broader range of practitioners in treatment for tobacco dependence.

Despite the common use and popularity of both smokeless tobacco and cigars, current research provides only limited information for developing successful interventions. Findings from decades of research on cigarette smoking are not necessarily applicable to the use of cigars and smokeless tobacco. Different routes and patterns of administration of nicotine are believed to result in different psychoactive effects and use patterns; consequently, researchers and clinicians cannot assume that findings from cigarette research necessarily apply to other forms of tobacco. Without research efforts directed specifically at these forms of tobacco, both prevention and treatment initiatives will be developed with inadequate bases of information.

Treatment for tobacco dependence need not be an expensive, time-consuming process. It can be as simple as a clinician's asking a patient about his or her tobacco-use status, offering to help the individual quit and providing follow-up assistance. In some countries, medications are available. For some individuals, particularly those who are heavy users of tobacco and who have a history of numerous failed attempts at quitting, more intensive treatment may be warranted and beneficial. Most countries with health care professionals such as nurses, physicians, and pharmacists already have the personnel to engage in tobacco dependence treatment; what is needed is training for these professionals.

Fundamental education about tobacco should include information on the cancer risks and other health risks due to tobacco exposure, the effects of passive smoke exposure, the content of tobacco smoke, withdrawal symptoms, and groups of people who have the most difficulty quitting. Clinical training should include basic intervention topics, relapse prevention, treatment medications and evaluation of treatment techniques (6, 114).

Implementing treatment can be an experience in misplaced expectations for those who expect any given one-time intervention to be effective and to have long-lasting effects. Rates of long term success in quitting are low, and the success rates of treatment can appear abysmal when taken out of context. Researcher and clinician John Hughes of the University of Vermont explains that tobacco dependence should be viewed in the light of other medical conditions:

> *Nicotine dependence, like all drug dependencies, is a chronic, relapsing disorder. In other chronic disorders (e.g., diabetes), any one given intervention (e.g., changing the dose of insulin) has a small effect on overall outcome; however, the cumulative effect of interventions (e.g., 20 years of care by a specialist) can have a large impact. Thus, these administrators, public health advocates and treating clinicians have to become used to the notion that the goal with treating smoking is not so much success on any one given attempt, but rather is achieving eventual success in a given individual in as short a time as possible. For some this will occur with the first attempt, for others it will not be till the fourth attempt. With other chronic relapsing disorders (e.g., arthritis), a major focus has been on having a single clinician providing care with multiple regular follow-ups and seeing the patient through both exacerbations and remissions. Current usual care for smoking is just the opposite. Even in the United States, many [health maintenance organizations] provide… therapy as a once-in-a-lifetime option. Systems in which providers or the media repeatedly prompt quit attempts and provide therapy probably have the best chance of inducing a long-term quit (117).*

Regrettably, the majority of persons in the helping professions do not know how to offer this assistance, and some are unwilling to offer it. A recent survey found that only about one third of the world's medical schools provided instruction in tobacco dependence treatment. More encouraging is the fact that 88 percent of medical schools include tobacco as a curriculum topic (120). The 1999 report on training for tobacco dependence

treatment among physicians in the United States indicated that most medical students were not being trained to help smokers stop, and that only 21 percent of practicing US physicians believed they were adequately trained in such treatment (114). The report's summary of what US medical schools should undertake could also apply equally to other professions whose practitioners have the potential to offer tobacco dependence treatment:

> *Until all medical schools place sufficient emphasis on the knowledge base and intervention skills needed to prevent and treat chronic tobacco-related diseases, it is unlikely we will see a decline in tobacco-related morbidity and mortality. However, if medical schools provide universal training of medical students in nicotine dependence intervention, tobacco users will have access to the professional expertise they need to end the deadly cycle of nicotine addiction (114).*

GENDER ISSUES

At the start of the 21st century, with women's and children's rights assuming greater stature internationally, research horizons are broadening, and gender differences and effects on children are of increasing interest. Arguments typically used in the past for excluding women as research subjects centered on hormonal effects related to the menstrual cycle and pregnancy that were believed to have the capacity to disrupt and confound research findings. Of course, this then limited our understanding of the morphologic and physiologic aspects of sex differences and limited the capacity of scientists to take advantage of elements unique to each sex. Similar limitations on the ages of research subjects restricted the applicability of research findings to children and elderly persons, and also restricted our understanding of interactions between the developmental process and phenomena such as tobacco use.

Researchers from many countries have seen beyond such limitations and have found ways to investigate issues relating to women's and children's use of substances of abuse, including tobacco. Funding agencies such as the US National Institutes of Health, which once systematically excluded female adults and children from many avenues of research, now require justification for such exclusions. Even so, the distance in time from research funding to publication of results and development of theories is typically a matter of at least several years. The good news, of course, is that over the coming years we will see publication of an increasing volume of such research findings.

Significant but subtle differences may exist between women and men in their responses to nicotine. Some of the findings are based on animal research, some are based on human research, and some are buttressed with both animal and human findings. It is possible that males and females of different species respond differently to other substances of abuse, as well as to nicotine. These differences, explained in a review by Perkins et al. (121), include the following comparisons between human males and females. Some of these conclusions require further research:

- Smoking in women is reinforced less by nicotine than by nonpharmacologic factors, such as conditioned responses to the sensory aspects of smoking and to social reinforcement.
- Nicotine replacement may be less efficacious among women as a treatment for tobacco dependence.
- Nicotine is reinforcing in different ways to men and women, including those not trying to quit smoking.
- Nicotine intake may be a less important consequence of smoking among women.
- Additionally, early reports indicate that menstrual cycle phase interacts with nicotine and withdrawal symptoms, and may make it more difficult for women to quit using tobacco at some points during the menstrual cycle, particularly the late luteal phase (122).

RESEARCH GAPS

Treatment

It is likely that subtleties in sex differences will help illuminate subtle aspects of research findings and clinical applicability that might otherwise be missed. This underscores the utility of this line of work not only to benefit females but also to benefit males. In this regard, it may be helpful to consider the philosophy and attitude behind the development of treatment and prevention measures, and perhaps to consider such analogues as woodworking, sewing, gardening, and flying. A carpenter must understand and work with the grain of wood to create workable furniture. A seamstress or tailor must understand and correctly utilize the grain of fabric in order for garments to fit well and hang properly. A gardener must work with such factors as climate, soil conditions, and resident insects to grow vegetable crops and flowers. A pilot or sailor who can fly or sail with respect for wind and currents will conserve fuel, will be more likely to reach the intended destination, and will have a safer journey. In this spirit, if treatment is a condition imposed upon tobacco users, its effectiveness will almost certainly be compromised. With such

considerations, models such as the stages-of-change model and its adaptations can provide useful maps for understanding and working with, rather than against, human processes (123).

However, if treatment is designed specifically to take advantage of those tendencies and traits unique to women and girls, it can be a creative enterprise. Experimental research and clinical reports are now sufficient in number and detail to provide an increasingly detailed portrayal of tobacco's unique effects on women and girls, and of the unique challenges women and girls face in treatment. Prevention and treatment approaches should utilize this knowledge to achieve optimal success in helping women and girls curb their tobacco use.

Sex differences

Most of the evidence on tobacco and nicotine comes from studies of men, leaving uncertainty as to the existence of significant gender effects relevant to prevention and the process of quitting. While many general findings, such as the addictiveness of nicotine and the health risks of tobacco, appear to apply comparably to the two sexes, not all specific findings from years of male-only studies can be assumed to be applicable to females. New studies building on decades of prior research need to include females from this time forward. Studies should be designed not only to test extensions of older hypotheses and findings but also to examine the accuracy of extending prior findings from males to females. Taking these extra research steps, though they may appear cumbersome, is the only way to establish a full and accurate picture of sex differences.

Specific areas in which prior work on sex differences warrants future inquiries include a comparison of interoception and exteroception in males and females and examination of age-related, environmental and familial effects. Similarly, the clinical efficacy of treatment medications and interventions should be tested in women and girls through research that allows comparison of new data on males with older findings, as well as simultaneous comparison of findings on males and females. This design will help determine the generalizability of specific findings and the appropriateness of various treatment methods.

Methodology

Virtually all comprehensive etiologic research about tobacco use indicates—or at least hints—that the use of tobacco is a multivariate phenomenon, with multiple factors leading to onset and continued exposure. This is also true of substance abuse in general. These realities make research amenable to analytic procedures that can account for the effects of numerous variables. Particularly appealing is an analytic strategy that allows examination of interrelations among multiple variables, e.g., psychiatric symptoms, personality factors and cognitive processes. This research approach can be expensive and thus difficult to fund. Such research typically cannot be conducted effectively by one investigator or even by a single research team at one institution. Instead, it can involve researchers from a variety of fields, many of whom may not know how to communicate their expertise effectively to persons outside their own narrow realm. It also can require considerable statistical sophistication beyond the capacity of a single researcher. Toward this end, funding agencies should encourage collaborative work that explores the richness and intricacy of the real-life milieu in which tobacco use occurs. People do not exist in univariate worlds, and tobacco use does not occur independently of other behaviors and influences. To the extent possible, research should reflect the complexity and interactions of the lives of those who are under study.

CONCLUSIONS

This overview has considered tobacco as a substance of addiction and treatment as an effective and viable alternative to tobacco use. It has reviewed the mechanisms of nicotine and of the constituents of tobacco and tobacco smoke, many of which are known carcinogens. It has presented information regarding the addictive qualities of tobacco products and has outlined gaps in research knowledge that remain to be explored. Certainly the lack of information on use of various non-cigarette forms of tobacco remains a serious research gap. This information vacuum should be addressed, not only regarding the forms of tobacco used in developed countries but with comparisons among the many forms of tobacco in use throughout the rest of the world.

From the evidence reviewed here, several salient points should be considered primary. First among them is the fact that tobacco is addictive. Second, findings indicate that treatment can be efficacious, even if the goal is only to move a tobacco user toward quitting and does not involve an immediate quit attempt. A third point is that males and females differ measurably in their responses to nicotine and tobacco and that these differences warrant further exploration. Additionally, treatment can be viewed as a basic health need.

Tobacco is addictive

Nicotine is the primary pharmacologic factor that influences and reinforces the behavior of all tobacco use. Nicotine appears to generate dependence by producing centrally mediated reinforcing effects, by regulating elements such as body weight and mood in ways that are perceived as useful or desirable by the tobacco user and by leading to a physical dependence such that abstinence may result in adverse symptoms. Tobacco products manufactured and sold worldwide are optimally designed to be addictive and to undermine the best efforts of persons who want to quit using them. Abstinence from tobacco following chronic use results in withdrawal symptoms, which occur in some constellation of unpleasant sensations, as is seen with other substances of abuse. The symptoms and effects of abstinence from nicotine often peak within 1–2 weeks and persist for as long as 3 or 4 weeks.

Treatment can be efficacious

A movement encouraging health professionals to take an active part in helping patients and clients quit using tobacco is building momentum. Treatments that have been endorsed to date include health professionals' offering brief advice on quitting, providing behavioral therapy, recommending nicotine replacement, and prescribing the medication bupropion. Providers of primary medical care, as well as those working with them, are being instructed to assess the tobacco-use status of patients at every visit, to advise tobacco users to stop, and to help them in doing so. Studies repeatedly indicate that a majority of smokers (and, presumably, other tobacco users) would like to quit using tobacco, and that many do accomplish a brief period of abstinence, although success rates for long term abstinence are low. Breaking dependence on tobacco can be characterized as a process; as such, it can be charted and tracked. Utilizing a model of the quitting process allows progress and success to be measured not only by the length of abstinence during a given attempt to quit but also by progression toward the goal of continued abstinence. This refinement of the stage approach underscores the potential utility of interventions that might move tobacco users toward abstinence, even if abstinence is not achieved as a direct result of a given intervention.

Responses can be distinct for men and women

Subtle differences exist between women and men in their responses to nicotine. Some of these findings are based on animal research, some are based on human research, and some are reinforced with both animal and human findings. Sex differences in nicotine responses include the findings that women sometimes have a lower rate of success in maintaining abstinence after quitting smoking and that smoking in women is reinforced less by nicotine than by nonpharmacologic factors. Similar, recent research indicates that nicotine replacement may be less efficacious among women, and that nicotine is reinforcing in different ways to men and women. Overall, nicotine intake may be a less important consequence of smoking among women than among men.

Prevention and treatment are basic to health

Discouragement comes easily in light of the widespread, heavy use of tobacco that is common throughout the world and the rapid spread of cultural acceptance of tobacco. Oddly enough, on the surface it appears that making this fatally addictive substance appealing is a far easier task than encouraging abstinence (16). It is important to remember, however, that behind what appears to be the seemingly indelible appeal of the Marlboro cowboy or the slender Virginia Slims models are vast amounts of funds spent on research. Every hour of every day, tobacco marketers are monitoring the sale and use of tobacco products as they measure the impact of marketing techniques. Every successful tobacco marketing or promotional campaign has been tested and refined through a relentless process in which the goal is to make a harmful product appealing. The almost unimaginable amounts of money that have been invested—and are still being invested, every day of every year—in making tobacco appealing have not been and likely never will be available to the public health community.

Providing assistance for tobacco users is, similarly, best approached as a condition that may take years and may involve many persons, but can be started with a health care professional asking one patient basic questions and offering basic assistance. Treating dependence on tobacco is a multi-step process starting with a single question and carried forward by the willingness of health care providers to give targeted help and offer useful advice. This effort may result in other life changes that have an impact on a tobacco user's capacity for becoming abstinent and maintaining abstinence. Nonetheless, providing treatment for less dependent and moderately dependent tobacco users does not need to be

an expensive process or one that consumes vast resources. Rather, it must become woven into health care practice, in the same way that vital signs are monitored and that recommending appropriate nutrition, hygiene and sleep are considered basics of health promotion.

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Quitting

Quitting

Saundra MacD. Hunter

Tobacco use, especially cigarette smoking, affects the health of a woman and her children throughout her life cycle. From birth to girlhood, womanhood, pregnancy, and motherhood, tobacco use harms the health of the girl, woman, and baby. Even in menopause, smoking continues its harmful effects on her health and quality of life. The well-documented health consequences of active and passive smoking for the fetus, the infant and child, and the woman are addressed in other chapters in this volume. The myriad adverse effects provide a compelling rationale for prevention and cessation of tobacco use.

This chapter addresses tobacco use prevention and cessation methods that are especially useful for women and girls. In the United States, there are estimates that three-fourths of all cigarette smokers have actually attempted to quit and 70 percent to 95 percent of smokers want to quit (1-3). Some studies have shown that women are more likely than men to begin smoking and less likely to quit (4, 5). Patterns of smoking by gender vary from country to country (6).

In developed countries such as the United States, men and women smokers are currently similar regarding intention to quit, number of quit attempts, and types of cessation programs desired (7,8). Although girls and women can suffer from addiction to tobacco just as men, many females face additional barriers to quitting. Women report more depression and greater concerns about weight gain after quitting. Furthermore, women constitute a disproportionate share of the poor. More than 70 percent of the estimated 1.3 billion people living in poverty are female (9-11). Women may also have more stressors (12), such as childcare responsibilities that affect them more than men. Therefore, tailor-made programs in tobacco use prevention and cessation are necessary to address these added burdens, as well as ethnic and cultural diversity.

Four models of tobacco use cessation and prevention are presented. They are 1) public health, 2) clinical, 3) educational, and 4) self-help models. Of course, there can be overlap among these models, and methods from one model can possibly be used in another. The chapter closes with recommendations for prevention and cessation programs targeted specifically to the needs of women and girls.

Issues relating to tobacco use, prevention, and cessation must consider the broader context of women's lifestyles. To focus on women's health requires a multidisciplinary approach to the screening, diagnosis, and management of conditions that have more or different risks for women than for men, or that are more prevalent among women. This approach recognizes that there are both biomedical and psychosocial aspects unique to women's health. Furthermore, health care for women should be based whenever possible on research that considers gender differences. Thus, a focus on women's health and illness is designed to answer questions of relevance for women (13), and to address unique socio-cultural, physiological and emotional issues about tobacco use, prevention and cessation in women (14). These are 1) the physiological factors involving the reproductive cycle; 2) socio-cultural expectations regarding appearance and weight; 3) cultural child-rearing expectations; 4) professional working demands unique to women; 5) cultural expectations of girlhood; and 6) poverty situations specific to women. As Anne Kasper states in the *Textbook of Women's Health*:

> *We need research that addresses how classism, racism, sexism, heterosexism, disability, prejudice, violence, and poverty precede, contribute to, and haunt the health and illness of all women (15).*

To have an impact on tobacco use, especially cigarette smoking, of girls and women, smoking prevention and cessation programs must identify and address the motivations and needs of female smokers. Tobacco use, prevention and cessation of use should be examined continually within the broader context of female

life experiences. To be genuinely effective, smoking cessation programs need to be responsive and meaningful. To respond effectively, diversity that encompasses ethnicity (16-18), local and/or global influences (19, 20), language (21-23), culture, age, race, sexuality, disability and socioeconomic status among women must be considered. Other important considerations for developing successful prevention and cessation programs are family responsibilities, inflexibility in the workplace, childcare and poverty. Any of these can be a barrier to the delivery of smoking cessation health care. Additionally, smoking cessation services must be accessible, respectful, safe and empowering for women (24).

BARRIERS TO SMOKING CESSATION

Addiction

As noted in the chapter *The Addiction Model* by Janet Brigham, the main barrier for tobacco use cessation, for men and women, is the physical addiction to nicotine in tobacco (25). Information about the risks of addiction is often poorly conveyed and incomplete, and individual smokers often do not believe that they are as much at risk of becoming addicted as other smokers (26). Social and psychological associations attached to cigarette use are achieved with classical and secondary conditioning. Russell has suggested that it takes only four cigarettes to become addicted to nicotine (28). Another study showed that the first symptoms of nicotine dependence can appear within days to weeks of the onset of occasional use, often before the onset of daily smoking (29). Addiction then becomes the main barrier for cessation in women and men. Pierce et al. estimated that it will take an average of 16 to 20 years of addicted smoking before the average adolescent, who reaches a lifetime consumption of 100 cigarettes, will be able to quit successfully (30). Withdrawal symptoms in adults and children include increased irritability, restlessness, depression, difficulty with concentration, hunger, and craving (31). Physiological changes occur in the brain, along with a drop in heart rate and adrenaline output, and a rise in skin temperature (32, 33).

Quitting tobacco use can be quite difficult for the addicted woman or girl (34, 35). Women are less confident about their ability to quit smoking than men (30 percent vs. 53 percent) (36). As many as three fourths of women smokers indicate a desire to want to stop smoking, but only 2.5 percent successfully stop for at least one year (37). Afew studies report that women have fewer successful smoking cessation attempts than men (4, 38, 39).

In many developed countries, smoking starts in the early years of adolescence. Children and teenagers underestimate the strength of addiction and assume that they can quit at any time. Among US high school seniors, fewer than two out of five smokers who believe that they will quit within five years actually do so (40). Several researchers have documented that adolescents exhibit symptoms of nicotine dependence (41-43). In a study of 77 adolescent smokers in a youth detention center, 42 percent reported relatively high levels of nicotine dependence and nearly 80 percent reported nicotine cravings with previous attempts to quit (44). A telephone interview of 15- to 22-year-olds showed that at least one symptom of nicotine withdrawal was reported by more than 90 percent of these youth who smoked daily (41). In a study of 249 10th grade (approximately 16 years old) adolescent smokers who reported previous attempts to quit cigarette smoking, 34.9 percent reported more than 2 withdrawal symptoms, while 30.5 percent reported no symptoms during previous attempts to quit. Craving, a strong motivational desire to smoke, was the most frequently chosen symptom (45.4 percent), followed by being nervous and tense (31.8 percent), restlessness (29.4 percent), more irritable (28.7 percent), hungry (25.3 percent), unable to concentrate (21.7 percent), miserable and sad (15.3 percent), and, lastly, trouble sleeping (12.8 percent). Among those who reported cravings during previous quit attempt, 45 percent had significantly higher scores on a modified Fagerstrom Tolerance Questionnaire, higher scores on CES-D questionnaire, and higher saliva cotinine levels. Overall, 35 percent of the variance in withdrawal symptoms was accounted for by the modified Fagerstrom scores and symptoms of depression (45).

Several studies specifically show addiction symptoms in adolescent girls. Among 136 inner-city girls aged 11-17 years in England, 71 percent of daily smokers and 72 percent of non-daily smokers reported having made an attempt to quit smoking. Of these, 74 percent of daily smokers experienced one or more withdrawal effects when they had attempted to stop smoking compared with 47 percent of non-daily smokers (Chi-square = 8.8, $P<0.005$). Withdrawal symptoms included: a strong need to smoke, more irritable, unable to concentrate, hungry, restless and miserable. The most common withdrawal symptom was a strong need to smoke (38 percent) followed by hunger (32 percent). There was a positive association between symptoms experienced and level of cigarette use (46). In a study of New Zealand teenage smokers, more females than males reported smoking to relieve withdrawal symptoms (42). Additionally, 80 percent of those who reported daily smoking identified

three or more criteria for nicotine dependence, as listed in the *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition, Revised (47).

In addition to tobacco addiction, women and girls may deal with other factors that exacerbate the difficulty of quitting tobacco use. These are fear of weight gain, depression, and other stressors such as childcare. Some women and girls who seek treatment for smoking cessation are increasingly likely to be hard-core, long-term users of nicotine who have these additional barriers for smoking cessation (48).

Fear of Weight Gain

Because many socio-cultural factors emphasize thinness, many girls and women dread being overweight or obese (49-52). About half of all adult women, both smokers and nonsmokers, say they are currently dieting (53). In a review of 144 studies, Sobal and Stunkard found a strong inverse correlation between a woman's weight and her social and economic status (the higher the status, the lower the weight) in Belgium, Britain, Canada, Czechoslovakia, Germany, Holland, Israel, New Zealand, Norway, Sweden and the United States (54). Studies in United States, Germany and Britain show that women who are thin are likely to marry men who have higher social and economic status than their family of origin (55). Given this situation, it is reasonable to expect that women and girls tend to smoke as a method of weight control (56, 57, 58). Advertising of cigarettes to women reflects the cultural expectations for women to be thin. A discussion of the effects of advertising on women's smoking is discussed in detail in the chapter *The Marketing of Tobacco to Women: Global Perspectives* by Nancy J. Kaufman and Mimi Nichter.

Several studies reporting on the relationship between body weight and cigarette smoking show that adult cigarette smokers weigh less than their nonsmoking counterparts but have a greater proportion of abdominal fat (59-62). Thus, cigarette smokers have a greater waist-to-hip ratio (WHR) which increases in spite of weight loss in persons beginning to smoke. Evidence shows that cigarette smoking increases metabolic rate, which may fall with smoking cessation (63). Nicotine has been shown to increase the energy expenditure associated with light activity (64). In population-based studies carried out in Nauru, Mauritius, and Western Samoa (65), the relationship between serum leptin, insulin levels, and body weight in cigarette smokers was evaluated independent of body mass index (BMI = kg/m2) or fat distribution. In all three populations, smokers were slimmer than nonsmokers. Smokers had lower levels of serum leptin, independent of observed differences in BMI or waist circumference; this relationship was dose-dependent. This is consistent with the idea that cigarette smoking may independently reduce serum leptin concentrations, rather than smokers having lower leptin levels just because they are leaner. Nicotine, through its various effects on the central nervous system (66), may modify leptin sensitivity, resulting indirectly in reduced leptin levels and maintenance of a lower body weight. The role of leptin in obesity is still under investigation, but it appears to play a role in regulation of energy balance in animal models (67).

Many women start and continue to smoke to control appetite and reduce body weight (39, 57, 68-71). Smoking females are twice as likely to be concerned about their weight as nonsmoking females (72). Weight concerns predict in initiation of smoking adolescent girls but not boys (57, 73, 74). This may be an attempt to restrain post-pubertal fatness: one characteristic of anorexia nervosa is attempts to postpone sexual maturity and restrain post pubertal female "fatness" (75). Concerns about normal post pubertal fatness and attempts to control it, however, are not limited to an eating disordered population. In London and Ottawa schoolgirls, post-menarchal girls were two to three times more likely to smoke (58). An association also exists between smoking, alcohol consumption, and anorexia nervosa of the binge/vomiting type (76).

Women expect to gain weight when they quit smoking, and evidence shows that are correct to expect this (77). Women gain more weight than men after cessation, either as a percentage of their initial weight or in absolute pounds (78). The estimated mean weight gain attributable to cigarette smoking cessation was 2.8 kg in men and 3.8 kg in women examined in NHANES I (1971-76) and Follow-Up Study (1982-84) (79). In adults, body weight tends to correlate with the number of cigarettes smoked (80, 81), and higher-dose smokers tend to gain more weight during attempts to quit (82). During the first month after cigarette smoking cessation, the average caloric intake increases by 300-400 calories per day (83). Most of this increase is in snacks. Gilbert and Pope found that intake from between-meal snacks increased 50 percent in men and 94 percent in women during smoking abstinence (32).

Fear of weight gain leads to relapse after cessation for some women smokers (68, 77, 84). Weight control smoking occurs in 12 percent - 25 percent of males but

in up to 40 percent in females (85,86). Young women are three to four times as likely as men to report weight gain as a cause of smoking relapse (32).

Dieters are more likely to have started, and to have continued, smoking in order to control their weight, and among current smokers, dieters reported shorter quit attempts (87). Compared with nonsmoking females, smokers are 2-5 times more likely to use diet pills (88). One study found that among former smokers, dieters reported considerably more weight gain than nondieters. Chronic dieters who are smokers tend to gain more weight than nondieters (15.2 lbs vs 5.5 lbs) (87). "Dietary restraint" is predictive of increased eating after smoking cessation (89, 90). Dieters tend to increase intake of high caloric snack foods as a substitute to smoking, and eating counteracts some withdrawal effects such as depression, increased fatigue, and decreased arousal (91).

Evidence supports the notion that attempts to prevent moderate weight gain after quitting have an opposite effect on continued abstinence rates (92). Furthermore, not all female smokers share the same concerns about weight, and not all quitters are equally susceptible to gaining weight after cessation. Perkins, for example, concluded from a review of the literature that little direct evidence favors a relationship between weight gain as an important factor in smoking relapse (92). He noted that most adult smokers (men and women) do not report 1) a relationship between smoking and weight, 2) use of smoking to control weight, 3) concern about weight gain after smoking cessation or 4) a previous relapse caused by weight gain during smoking cessation. Because of the modest effect of a mean 8- to 10-pound weight gain on health compared with that of smoking, patients should focus on smoking cessation and not controlling weight simultaneously (74). Perhaps a broad attempt at changing attitudes about weight gain and body image and not weight gain per se is the best approach.

Depression

Depression is twice as common among American women as men (21.3 percent vs. 12.7 percent) (93), and can present another barrier for smoking cessation in women. Subgroups of women—including minorities, women of low socioeconomic status, and women with less education—have higher rates of depression (93). Childbirth (94) and menstrual cycle (95) are associated with depression and may even serve as triggers for an episode of major depression (96-99). Evidence is increasing that smoking and depression are associated more than would be expected by chance alone (5, 100, 101). One study showed that depression is four times more common among smokers than nonsmokers (60 percent vs. 15 percent) (102). Hormones related to the reproductive cycle influence depression and smoking behavior. Women report using cigarette smoking for mood management and cigarettes as a coping mechanism and stress reliever (4).

Not all female smokers share the same concerns about weight, and not all quitters are equally susceptible to gaining weight after cessation.

Because nicotine in cigarettes can increase the feeling of well-being and elevate mood, researchers have suggested that some women smokers may self-medicate depressed moods with nicotine (103, 104). Nicotine in cigarettes is a powerful pharmacologic agent with a wide variety of stimulant and depressant effects involving the central and peripheral nervous system. A review of neurobiology of tobacco smoking provides examples of the mechanisms for reinforcing tobacco use, including the enhancement of memory and treatment for depression with nicotine and MAO-inhibiting chemicals in tobacco smoke. Recent studies implicate the neurotransmitters glutamate and serotonin (105).

A history of depression and current depressive symptoms are independently associated with failure to quit smoking (96, 101). Significantly higher levels of depression symptoms were reported among 16-year-old female smokers who attempted to quit as compared to males and nonsmoking females (45). Anda et al. (5) and Radloff (106) found a significant negative association between baseline depression scores and quit rates. Smoking cessation may change the balance of neurochemical modulators of moods (103). Depressed mood, anxiety, anger, irritability and fatigue are all symptoms which often peak within a few days after smoking cessation (107).

Smoking cessation may provoke the onset of a depressive episode among smokers who may or may not have histories of major depression (108, 109, 110). One study found three women without notable histories of depression who developed major depression following smoking cessation; they required psychiatric intervention (110). When depressive symptoms emerge during withdrawal from nicotine, the likelihood is higher for

both cessation failure (5, 111, 112) and relapse (113). Furthermore, resumption of smoking can reverse depression symptoms (109, 114).

Stressors and other factors affecting girls and women

Teenage girls report more stressful life experiences than boys (115-119). The gender differences in perceived stress may be explained by differences in coping strategies. Girls are more likely to seek emotional and social support rather than more productive coping styles than boys (120-122). Dugan, Lloyd and Lucas did not find, however, that girls were more likely to smoke because they experienced more stress and coped with it differently than boys (123).

In a study in Tucson, Arizona (US), 205 girls in grades 10 and 11 (mean ages 16 and 17) were drawn from two urban high schools (124). Overall, 30 percent reported current smoking, 7 percent were ex-smokers, and 63 percent were never-smokers. The most frequently cited reasons for smoking were stress reduction and relaxation. Stress-inducing situations included family environment, social relations with classmates and schoolwork. The girls experienced little overt peer pressure to initiate smoking: rather, the theme of independence in smoking initiation and continuation permeated girls' narratives about their smoking behavior. Girls attempted to project the image that they could control their cigarettes rather than having their cigarettes control them (124).

In a small, British study, males and midcycle females achieved significantly greater smoking reduction than premenstrual females during the "no smoking" days (95). Premenstrual females reported becoming significantly more tired, confused, depressed, anxious and irritable than midcycle females. Midcycle females reported only slight changes in feeling state during cigarette withdrawal. The position of the males was broadly intermediate between the two female groups (95).

Oral contraceptives may be used by women to limit family size and the stresses associated with raising a large family (125). Having a large family has been associated with significant increases in diurnal systolic and diastolic blood pressure among white-collar women holding a university degree. In these women, the combined exposure of large family size and job strain had greater effect on blood pressure than either one alone (126). When women smokers use oral contraceptives to limit family size, they are at greater risk for acute myocardial infarction and stroke (127, 128). Results of an Obstetrics and Gynecology consensus panel recommended that all women be asked at every visit if they smoke, and that health practitioners encourage and help them to quit if they do smoke (128). The decision to prescribe oral contraceptives requires a detailed family and personal history of thrombotic disease. Measurements of lipids should be taken for smokers > 35 years old. Women > 35 years old who smoke heavily (>15 cigarettes/d) should be denied the use of oral contraceptives (129). Preliminary data suggest that oral contraceptives with the low dose of 20 micrograms ethinyl estradiol may be safer for oral contraceptive users who smoke although much more research is required to affirm this(130).

High rates of smoking are found among disadvantaged women, and cessation interventions should be targeted specifically to meet their needs. Disadvantaged women revealed that their smoking was intimately linked with their life situation of poverty, isolation and caregiving and cigarette smoking was a mechanism for coping with the stress of their lives (131). Agencies outside traditional tobacco control organizations, such as women's centers, might effectively initiate or expand services that support smoking cessation for these women (132).

PREVENTING INITIATION, OR ENCOURAGING CESSATION OF TOBACCO USE: THE MODELS

Prevention of tobacco use may be approached in several ways. First is to prevent starting the use of tobacco products; second is the prevention of long-term use, dependence, or addiction to tobacco. In the United States, it is estimated that 3,000 children each day begin to use tobacco and 750 of them will eventually die from a tobacco-related disease (40, 133). In many developed countries, girl smokers outnumber boys, while in many developing countries, few girls and women smoke. The determinants of why women and girls start and continue to use tobacco are described in detail in the chapter *Initiation and Maintenance of Tobacco Use* by Samira Asma, et al.

Eradication of tobacco use with either approach or a combination is important on several levels (40,134). Billions of dollars are spent for advertising associating tobacco use with the pleasures and needs of girls and women, making it difficult to prevent the initiation of smoking. This is described in the chapter *The Marketing of Tobacco to Women: Global Perspectives* by Nancy Kaufman and Mimi Nichter. After the release

of the first U.S. Surgeon General's report on smoking and health in 1964 (135), most strategies to control cigarette use focused on educating smokers about the harms associated with tobacco use (136). The primary conceptual framework on which state-of-the-art prevention programs are based is social factors that mediate smoking onset. The effects of smoking prevention programs, however, tend to be short-lived (133).

Each year less than 1 percent of smokers attempting to quit are successful. About seven out of ten adult smokers report they regret starting to smoke and would like to quit (137, 138). A study in Australia explored the level of agreement among health experts on the perceived relative cost and effectiveness of 29 smoking reduction strategies in a hypothetical Australian state (139); investigators found that there was little agreement among them. The study results suggest that experts may not be able to provide clear and consistent direction to health organizations on how to best reduce smoking rates (139). This conclusion points to the need for multilevel, multidisciplinary, culturally sensitive approaches to tobacco use prevention and cessation which includes public health, educational and clinical models. The following section will describe these models and evaluate reported effectiveness.

Public health models

The public health model is the most cost-effective strategy and is discussed in greater detail in other chapters including those by Kaufman and Nichter and by Jacobs. Anti-tobacco policies, multimedia dissemination of health information, bans on tobacco advertising and promotion, the display of prominent warning labels, restrictions on smoking in public places and increased access to smoking cessation programs are examples of public health efforts which are effective in reducing smoking (140, 141).

The development of a WHO Framework Convention on Tobacco Control and related protocols conforms to the public health model. International agreements will focus on the following public health initiatives: 1) pricing and taxation; 2) smuggling; 3) duty-free tobacco products; 4) tobacco advertising and sponsorship; 5) testing and reporting of toxic and other constituents; 6) package design and labeling; 7) agricultural policy; and 8) cooperation and information sharing (142). The World Bank examines the costs of worldwide tobacco control policies and suggests a plan for action that includes strategies for tobacco farmers (143).

At the community level, organizations can emphasize involvement of local residents in program planning and implementation in promoting nonsmoking. One program was successful in engaging audience members in its governance and in instigating numerous and diverse neighborhood activities to promote nonsmoking (144). The prevalence of smoking declined from 34 percent to 27 percent in program neighborhoods, but only from 34 percent to 33 percent in the control group neighborhoods. Recent findings suggest, however, that secular trends in risk factors and health behaviors mask community-level program effects (145).

Media campaigns are designed to reach large numbers of people through brochures, television, radio, the Internet, newspapers, billboards and posters. The campaigns have the potential to reach and to modify the knowledge, attitudes and behavior of a large proportion of the community. Such efforts are particularly important in low- and middle-income countries. For example, a representative national survey in China found that 55 percent of Chinese non-smokers and 69 percent of smokers believed that cigarettes did "little or no harm"(146). In developed, high-income countries, general awareness of the consequences of smoking for health is greater; however, many smokers underestimate these risks (26).

To determine the effectiveness of mass media campaigns in influencing the smoking behavior (either objective or self-reported) of people under the age of 25 years, a Cochrane Review examined 63 studies reporting information about mass media smoking campaigns (147). Studies were classified as randomized controlled trials, controlled trials without randomization and time-series studies. Two studies concluded that mass media campaigns were effective in influencing smoking behavior of young people. Both effective campaigns had a solid theoretical basis, used formative research in designing the campaign messages and broadcast the message with reasonable intensity over extensive periods of time. Therefore, there is some evidence that mass media can be effective in preventing the uptake of smoking in young people.

A mass media smoking cessation campaign including television shows, a television clinic, a quit line, local group programs and a comprehensive publicity campaign was examined for reach, effectiveness and cost-effectiveness in The Netherlands (148). A random sample of baseline smokers (n = 1338) was interviewed before and after the campaign and at a 10-month follow-up. A control group (n = 508) of baseline smokers

was not pre-tested to control for test effects. Most smokers were aware of the campaign, although active participation rates were low. Dose-response links between exposure and quitting were found, e.g., the greater the exposure, the greater the likelihood of quitting. The follow-up point prevalence abstinence rate attributable to the campaign was estimated to be 4.5 percent after controlling for test effects and secular trends. The cost per long-term quitter was about $12.

In China women reached a higher abstinence rate (50 percent) than men (36 percent), whereas in Finland men achieved a better result (14 percent) than women (9 percent).

Asmoking cessation method targeted at adult daily smokers in 25 countries in 1996 was presented as a contest entitled *International Quit and Win '96* (6). To compare background and process variables, follow-up status and factors contributing to the sustained no-smoking of the participants in this contest, a standardized 12 month follow-up was conducted in China and Finland. Sample sizes were 3,119 participants in China and 1,448 in Finland. Conservative (considering all non-respondents relapsed) and non-conservative (based on respondents only) estimates were calculated for a one-month abstinence, 12-month continuous abstinence, and point abstinence at the time-point of follow-up. Researchers found significant differences in the background and process variables, as well as in the outcome measures. At the one-year followup, the conservative continuous abstinence rates showed that the Chinese participants maintained their abstinence at a higher rate (38 percent) than the Finnish participants (12 percent). In China women reached a higher abstinence rate (50 percent) than men (36 percent), whereas in Finland men achieved a better result (14 percent) than women (9 percent).

Policies enacted to curb tobacco use, prevent initiation and encourage cessation fall under the public health model. Policies include taxes, warning labels, bans on advertising and promotion and "no smoking" areas.

In general, tobacco product price increases reduce overall tobacco consumption. Evidence also shows that the impact of price increases is particularly strong among young people, making tax policy one of the main tools in reducing the onset of tobacco dependency. This is described in detail in the chapter *Economic Policies, Taxation and Fiscal Measures* by Rowena Jacobs. Tax increases are effective at reducing tobacco use: for example, tax increases that raise the retail price of cigarettes by 10 percent would reduce smoking by about 4 percent in high income countries and by about 8 percent in low income or middle income countries (140, 141, 143). As with nearly all other products, demand for tobacco products falls as prices rise. The strength of this relation has been shown to vary between nations and demographic groups (150).

Interventions with retailers can lead to large decreases in the number of outlets selling tobacco to youths. A Cochrane Review assessed the effectiveness of interventions to reduce underage access to tobacco by deterring shopkeepers from making illegal sales (151). This was accomplished by a systematic literature review of intervention studies designed to alter retailer behavior, either through education about, or enforcement of, local laws. The outcomes were changes in retailer compliance with legislation (assessed by test purchasing), changes in young people's perceived ease of access to tobacco products, and changes in smoking behavior. Controlled studies with or without random allocation of retail outlets or communities, and uncontrolled studies with pre- and post-intervention assessment, were included. Giving retailers information was less effective in reducing illegal sales than active enforcement and/or multicomponent educational strategies. Three controlled trials showed little effect resulting from intervention on youth regarding perceptions on access or prevalence of smoking. However, few of the communities studied achieved sustained levels of compliance. This may explain why there is limited evidence of effective intervention on youth regarding perception of ease of access to tobacco, and on smoking behavior. Gender differences were not evaluated.

Environmental tobacco smoke is a health hazard. This is described in detail in the chapter *Passive Smoking, Women and Children* by Jonathan Samet and Gonghuan Yang. Reducing exposure to tobacco smoke in public places is a widespread public health goal. There is, however, considerable variation in the extent that this goal has been achieved in different settings and societies. There is, therefore, a need to identify effective strategies for reducing tobacco consumption in public places.

To examine the effect of an organizational smoking ban, a study was conducted on female United States Navy recruits (152). Study participants were female Navy recruits entering the recruit training command between March 1996 and March 1997 (n = 5503 over

12 consecutive months). At baseline, the recruits completed smoking surveys at entry, and again at graduation after exposure to an eight week, 24-hour a day smoking ban. Relapse rates among baseline ever smokers were assessed three months after leaving recruit training. There was a significant reduction (from about 41 percent to 25 percent, $p < 0.001$) in the percentage of all women recruits who reported themselves as smokers. Relapse at the three-month follow-up varied according to the type of smoker. Rates ranged from 89 percent relapse among daily smokers to 31 percent among experimenters. Findings suggest that the ban provided some smokers with a reason and support to quit, although the high relapse rates suggests that more than a smoking ban is needed to help some smokers to maintain no smoking.

In a Cochrane literature review, interventions for preventing tobacco smoking in public places were evaluated (153). Studies with strategies targeted toward populations were selected; these included educational campaigns, written material, non-smoking and warning signs. Individual smokers and comprehensive strategies were evaluated. Eleven of 22 studies were included, all lacking a strong experimental design. The most effective strategies used comprehensive, multicomponent approaches to implement policies banning smoking within institutions. Less comprehensive strategies, such as posted warnings and educational material, had a moderate effect. Five studies showed that prompting individual smokers had an immediate effect, but such strategies are unlikely to be acceptable as a public health intervention. Most studies were conducted in the US and did not consider gender differences.

Clinical model guidelines.

Clinical intervention for tobacco use cessation is a goal identified worldwide (143, 154, 155), yet cigarette smokers report that only 50 percent have ever been advised by their physicians to quit smoking. The most significant advancement in clinical approaches to smoking cessation is the development of brief intervention guidelines for physicians in a medical practice. In one study (156), 3.6 percent of former smokers had quit with the aid of their physicians. Studies show that counseling by a healthcare provider, regardless of specialty, is an effective intervention (157). Quit rates show dose-response relationships with the amount of counseling contact time, duration of treatment, and problem-solving skills training (158). The critical time for intervention is within one week of quitting because most relapses occur when withdrawal symptoms peak. Among those smokers with a health related illness (e.g., a recent heart attack), the quitting rate can exceed 50 percent (158). The key components of this brief intervention (157) are:

1. **Ask** and document in the patient's chart their use of tobacco products.
2. **Advise** all patients who use tobacco products to quit. Do this at each patient encounter.
3. **Assess** their readiness to quit.
4. **Assist** with a plan by negotiating a quit date, providing self-help materials, suggesting a nicotine replacement product, perhaps prescribing cessation aids (e.g., bupropion), discussing behavior modification techniques (e.g., limiting the areas where smoking is allowed) and/or referring patient to a specialized smoking cessation clinic.
5. **Arrange** a follow-up to monitor progress and provide support.

TABLE 1: GUIDELINES ON SMOKING CESSATION: SUMMARY OF EVIDENCE

INTERVENTION	DATA SOURCE	INCREASE IN % OF SMOKERS ABSTINENT FOR ≥ 6 MONTHS *
Very brief advice to stop (3 min.) by clinician vs. no advice	Agency for Health Care Policy and Research (159)	2
Brief advice to stop (up to 10 min) by clinician vs. no advice	Agency for Health Care Policy and Research (159)	3
Adding Nicotine Replacement Therapy (NRT) to brief advice vs.brief advice alone or brief advice plus placebo	Cochrane (168)	6
Intensive support (for example, smokers'clinic) vs. no intervention	Agency for Health Care Policy and Research (159)	8
Intensive support plus NRT vs. intensive support or intensive support plus placebo	Cochrane (168)	8
Cessation advice and support for hospital patientsvs.nosupport	Agency for Health Care Policy and Research (159)	5
Cessation advice and support for pregnant smokers vs.usual care or no intervention	Agency for Health Care Policy and Research (159)	7

* adapted from (167)

The guidelines in Table 1 are supported in the United States by the US Public Health Service (159), the U.S. Preventive Services Task Force (160), the Agency for Healthcare Research and Quality (161), the National

Cancer Institute (162), and the American Medical Association (163) and by the National Health Service in United Kingdom (164-166). The purpose of these guidelines is to recommend and promote the integration of cost effective interventions into routine clinical care. These guidelines, however, are not gender-specific. The table below provides a summary of evidence used to create the guidelines for smoking cessation.

Special populations. Targeting special populations with specialized clinics brings together individuals with common needs and life situations. One study of substance abuse and cigarette-smoking adolescents aged 14 to 19 showed that 86 percent reported current cigarette smoking, 75 percent smoked daily (of these, 65 percent smoked ten or more cigarettes), and 75 percent smoked for two years following treatment for alcohol and other drug abuse (169). In 1989, the National Cancer Institute convened and Expert Advisory Panel on the Prevention and Cessation of Tobacco Use among High-Risk Youth (133). A high-risk adolescent for tobacco use was defined as those youth "at high risk for regular use of tobacco as an adult," rather than youth who experiment with tobacco. Other characteristics of high-risk youth were defined in the US Omnibus Anti-Substance Abuse Act of 1986 and 1988 (170). High-risk adolescents also abuse other substances (169). Table 2 compares characteristics of at-risk youth from two sources. Recommendations of the Panel (133) for identifying high-risk groups are shown below.

TABLE 2. CHARACTERISTICS OF YOUTH AT HIGH RISK FOR TOBACCO USE

DEFINED BYBOTVIN ETAL. (171)	DEFINED BYU.S. OMNIBUS ANTI-SUBSTANCE ABUSE ACT OF 1986 AND 1988 (169)
TOBACCO SPECIFIC BEHAVIORS:	SOMEONE LESS THAN 21 YEARS OLD AND HAS ONE OR MORE OF THESE CHARACTERISTICS:
1. Previous tobacco use	1. A child of a substance abuser
2. Parent(s) who uses tobacco	2. A victim of physical, sexual, or psychological abuse
3. Sibling(s) who uses tobacco	3. Has dropped out of school
4. Peer(s) who uses tobacco	4. Is economically disadvantaged
5. Living in a rural area	5. Has attempted suicide
6. From a low-income home	6. Has committed a violent or delinquent act
7. From a single-parent home	7. Experienced long-term physical pain due to injury
8. Poor school performance in school	8. Experienced chronic failure
9. Intention to quit school	9. Unemployed
10. Positive attitudes toward tobacco use	10. Pregnancy
11. External locus of control	11. Family conflict
12. Being from a minority group	12. Frequent anti-social behaviors

1. High-risk youth should be identified in lower elementary grades.
2. Risk factors for becoming a regular smoker as an adult should not be considered different from risk factors which predict other deviant behavior.
3. The greater number of risk factors present for a youth or group of youths, the greater their risk of becoming regular smokers as adults.
4. Youth who are economically disadvantaged, have low educational achievement and/or aspirations, or are members of minority racial or ethnic groups may be considered at highest risk and most in need of targeted programs.
5. Youth who are no longer in school are at greatest risk (172).
6. Rather than individuals, entire schools (or relevant organizations) should be the target of efforts to identify high-risk youth.

Prevention programs must be delivered to all children, those who are high-risk and low-risk. The following are specific to high-risk youth:

1. Introduce programs as early as possible, even if tobacco use is unexpected for that age.
2. Target programs to those who work with high risk youth, such as teachers, counselors, coaches, health care personnel.
3. Use both direct and indirect methods of reaching high-risk youth, rather than one approach alone, such as, modifying school policies (173).

Healthy People 2000 (154), the American Medical Association Guidelines for Adolescent Preventive Services (174), and the US Preventive Services Task Force (175) recommend that clinicians help young smokers quit and advise those who do not use tobacco not to start. Twenty percent of pediatricians, 24 percent of family practitioners, and 8 percent of general dentists reported they always counsel 10- to 18-year-old patients to avoid smoking (176). A major barrier for not talking to young tobacco users is fear of upsetting or embarrassing them (177, 178).

When assessing women and girls—another specially targeted group—for tobacco use cessation, researchers need to consider the level of nicotine dependence, the

co-occurrence of depression, schizophrenia, alcoholism and/or other chemical dependency and low motivation to quit. Providers can advise smokers to quit smoking during routine gynecologic visits. Because many women and girls may have tried to quit using tobacco several times and failed, they may have low self-efficacy or lack confidence in their ability to quit (179). The presence of others who smoke, either at home, at work, or socially adds to the difficulty with quitting. High stress levels, such as a stressful life circumstance and/or a recent major life-change (e.g., job change, divorce, childbirth) are further interferences to smoking cessation, and the girl or woman attempting to quit may require psychotherapy.

Adverse health outcomes in babies from prenatal maternal smoking are well-documented (180). Cigarette smoking during pregnancy has been associated with low birth weight, placental abruption, sudden infant death syndrome (SIDS), preterm delivery, and other adverse outcomes (181, 182). The effects of tobacco use on the baby and cessation methods for mothers are discussed in the chapter *Smoking, Cessation and Pregnancy* by Richard Windsor. Biologically, nicotine constricts the uterine arteries and carbon monoxide affects oxygen transfer to the placenta (183). Several programs have been developed for cessation of tobacco use among pregnant women (184-188).

One study evaluated the sustained smoking cessation rate in hospital patients who received a structured program of advice and support from a counselor and to estimate the cost-effectiveness of such an intervention (189). Hospital in-patients or out-patients were referred by their physician or surgeon to the smoking cessation counselor who reinforced the doctor's advice and provided support through repeated follow-up sessions, weekly in the first month and thereafter at three, six, and twelve months. Of the 1,155 patients referred to the counselor, 114 (13 percent) failed to keep the first appointment and 348 (30 percent) attended on one occasion only. Among the latter, the self-reported sustained cessation rate at one year was 5 percent. Allowing 7.5 percent success rate among patients receiving a physician's advice only, the cost of each additional success achieved as a result of the program was £851 and the cost per life year saved is between £340 and £426. Assuming that after one year's abstinence relapse rates are relatively small, this represents an investment when compared to the cost of treating patients with smoking-related illnesses (189). Another study found six subgroups of patients who responded to the intervention with varying degree of success (190). Age, depressed mood scores, addiction scores and alcohol intake predicted various degrees of success or failure.

Because many physicians have not incorporated smoking cessation counseling into their practices, unique smoking cessation clinics operate either alone or within a medical practice (191). These programs have developed in response to requests from various health care providers who want to refer resistant individuals. These programs can offer the person the opportunity to choose among many tobacco-use cessation methods. More research is needed to confirm that women and girls need their own specialized clinic setting.

A multi-component motivational smoking cessation clinic-based intervention was evaluated in 33 prenatal, family planning, and pediatric services in 12 public health clinics (192). Clinic personnel delivered the intervention components as part of a routine office visit. The evaluation design included pre- and post-intervention measurements of multiple study outcomes in a baseline (all clinics prior to the start of the intervention) and an experimental period (matched pair random assignment of clinics to intervention or control conditions). Subjects were 683 (baseline) and 1,064 (experimental) smokers with measurements of smoking outcomes at both times. Control and intervention clinics had similar outcomes in the baseline period. In the experiment, outcomes improved in the intervention but not in the control clinics. Compared to controls, smokers exposed to the intervention were more likely to have quit (14.5 versus 7.7 percent) or to take actions toward quitting and had higher mean action, stage of readiness and motivation to quit scores. These positive effects persisted when clustering within clinic and services were controlled (192).

Delivery of cessation methods.

There are several formats for the delivery of tobacco use cessation methods. They include the following:

Self-help includes quitting by the "cold turkey" method. Women and girls can also taper the amount of nicotine in their system to avoid withdrawal symptoms. Many self-help materials are available: they vary from informational brochures to extensive programs with video and audio material. In general, self-help methods have not been evaluated significantly for effective smoking cessation. Gradual reduction of smoking by scheduled smoking at regular intervals has a greater success rate that self-tapering or "cold turkey" (158).

Individual therapy or counseling (193) may be necessary for those who do not want to participate in a group format. Individual therapy is also necessary for psychological pathology (194), unresolved developmental issues, depression (195), post-traumatic stress disorder and anxiety disorders. In a Cochrane Review (196), there was no evidence of a difference in effect between individual counseling and group therapy (odds ratio 1.33, 95 percent confidence interval 0.83 to 2.13).

Group psychotherapy can be effective, although how the group affects psychosocial and psychosexual development of children and adolescents is often overlooked in education and therapy. The influence of relationships is also overlooked in adults. Groups and relationships are often the root of many maladjustments and social pathology (197, 198), which can lead to using tobacco, abusing alcohol and other harmful behaviors. Association with groups must be recognized as a prime experience for personal development. Humans consciously use groups for enhancement of personality and for psychologic survival. It is important to recognize when developing smoking prevention or cessation programs that the craving for acceptance by, and association with, other people is of primary importance. It is therefore understandable that an effort should be made to explore the possibilities of employing the group as a corrective tool. In a Cochrane Review (199), psychotherapy groups have demonstrated cost effectiveness with many behavioral problems (200, 201). More research is needed, however, regarding their cost effectiveness for group smoking prevention and cessation programs, especially for women and girls.

Telephone counseling is an effective addition for any tobacco-use cessation program (202). This type of support is especially useful for women who are homebound with young children. Of course, this method can only be used in countries where telephone use is widespread. The contents of interventions may take many forms. Findings from clinical research for smoking cessation have suggested screening the smoker for *Stage of Change* (203-205), level of addiction (206), or classified as a hard-core user (207). A variety of issues or components may need to be addressed or considered as part of the intervention with women and girls. They are described below.

Major depression, whether historical, current, or subsyndromal, presents unique challenges to women attempting to quit smoking. Such individuals may require antidepressant medication and psychotherapy to remain nonsmokers (208). Since many women who are depressed—or who have developed depression during prior quit attempts—may be less likely to seek formal cessation treatment, practitioners have a unique opportunity to persuade their patients to quit (96). Patient-treatment matching is very important. It is also important to monitor depressive symptoms in patients undergoing smoking-cessation treatment. The recurrence of depression following smoking cessation has been documented among smokers with a history of depression. Some women smokers self-treat negative affect with nicotine and underscores the importance of monitoring depressive symptoms in patients undergoing smoking-cessation treatment (110).

The weight/diet/nutrition component cannot be overlooked. A randomized trial of 417 women smokers was conducted to test the addition of two weight-control strategies to a smoking cessation program (69). Participants received a standard smoking cessation program, the program plus nicotine gum, the program plus behavioral weight control, or the program plus both nicotine gum and behavioral weight control. Smoking cessation rates were highest in the group receiving the smoking cessation program plus nicotine gum. Weight gain did not vary by treatment conditions, so its effect on relapse could not be examined by group. No significant relationship was evident between weight gained and relapse in individuals. The added behavioral weight-control program was attractive to the participants. However, it did not produce the expected effect on weight, thereby restricting the study's ability to examine the effect of weight control on smoking cessation and relapse.

Weight gain is minimized if smoking cessation is accompanied by a moderate increase in the level of physical activity. In the Nurses'Health Study, data from an ongoing cohort of 121,700 US women aged 40 to 75 in 1986 were examined prospectively to determine if exercise can modify weight gain after smoking cessation (209). The average weight gain over 2 years was 3.0 kg in the 1474 women who stopped smoking, and 0.6 kg among the 7,832 women who continued smoking. Among women smoking 1 to 24 cigarettes per day, those who quit without changing their levels of exercise gained an average of 2.3 kg more than women who continued smoking. Women who quit and increased exercise by between 8 to 16 MET-hours (the work metabolic rate divided by the resting metabolic rat) per week gained 1.8 kg and the excess weight gain was only 1.3 kg in women who increased exercise by more than 16 MET-hours per week. In general, smoking cessation is associated with a net excess weight gain of

about 2.4 kg in middle-aged women. Weight gain is minimized if smoking cessation is accompanied by a moderate increase in the level of physical activity. There is evidence that exercise may alleviate the negative affect normally associated with nicotine withdrawal (210,211), but not in all cases (110). Exercise can help prevent smoking relapse (212), although a recent meta-analysis of studies of exercise and smoking cessation shows that the effects are unclear (213).

Nicotine replacement therapy (NRT) is one example of a pharmacologic intervention that has proven to be an effective aid for smoking cessation.

A literature review to determine whether exercise-based interventions combined with a smoking cessation program was more effective than a smoking cessation intervention alone was carried out for the Cochrane Review (214). Randomized trials comparing an exercise program as an adjunct to a cessation program with a cessation program alone with a follow-up of six months or more were evaluated. There was no attempt at meta-analysis and the studies were summarized. Eight trials were identified; six of the trials had fewer than 25 people in each treatment arm. They varied in timing and intensity of the smoking cessation and exercise programs. Only one trial showed a significant benefit from the exercise program at long-term follow-up. Trials are needed with larger sample sizes, equal contact control conditions, tailored and lifestyle exercise program and measures of exercise adherence.

Other cessation formats

Less traditional formats may need to be considered. Hypnotherapy, for example, is used to act on underlying impulses to weaken the desire to smoke or strengthen the will to stop. In the Cochrane Review (215), randomized trials of hypnotherapy reporting smoking cessation rates at least six months after the beginning of treatment were evaluated. There was significant heterogeneity between the results of the individual studies, with conflicting results for the effectiveness of hypnotherapy compared to no treatment or to advice. There was no evidence of an effect of hypnotherapy compared to rapid smoking (see below) or psychological treatment or no treatment. Gender differences were not examined.

Aversive smoking is another example of a less traditional format. In aversive smoking a pleasurable stimulus of cigarette smoking is paired with some unpleasant stimulus in aversion therapy for smoking cessation. Rapid smoking is one type of aversive smoking. In a Cochrane Review (216), randomized trials which compared aversion treatments with inactive procedures or which compared aversion treatments of differing intensities for smoking cessation were evaluated. Trials had follow-up of a least 6 months from the beginning of treatment. The result of the only trial using biochemical validation of all self-reported cessation was non-significant. There was a borderline dose-response to the level of aversive stimulation (OR=1.66, 95 percent CI=1.00-2.78). The existing studies showed insufficient evidence to determine the efficacy of rapid smoking, or whether there is a dose-response to aversive stimulation. Gender differences were not examined.

Acupuncture has also been used as an intervention. In a Cochrane Review (217), 16 randomized controlled trials comparing a form of acupuncture with either sham acupuncture, another intervention, or no intervention for smoking cessation were evaluated. Abstinence from smoking before twelve weeks, at six months, and at one year follow-up in patients smoking at baseline was assessed. Meta-analysis was used when appropriate. Acupuncture was not superior to sham acupuncture in smoking cessation at any time point. The odds ratio (OR) for early outcomes was 1.20 (95 percent CI to 0.97 to 1.47); the OR after 6 months was 1.29 (95 percent CI 0.82 to 2.01) and after 12 months 1.02 (95 percent CI 0.72 to 1.43). Gender differences were not evaluated.

Pharmacologic interventions, such as described in Table 3, are another method of advancing smoking cessation (218). Nicotine replacement therapy (NRT) is one example of a pharmacologic intervention that has proven to be an effective aid for smoking cessation. Nicotine replacement therapies are designed to minimize withdrawal symptoms which include restlessness, irritability, anxiety, difficulty concentrating, dysphoria and insomnia. In a Cochrane Review (219), nicotine replacement therapy for smoking cessation was evaluated. All of the commercially available forms of NRT (nicotine gum, transdermal patch, the nicotine nasal spray, nicotine inhaler and nicotine sublingual tablets) are effective as part of a strategy to promote smoking cessation. They increase quitting rates by approximately 1.5 to 2, regardless of setting. The effectiveness of NRT appears to be largely independent of the intensity of additional support provided to the smoker. Since all the trials of NRT reported so far have included at least some form of brief advice to the smoker, this represents the minimum that should be offered to ensure its effectiveness. Provision

of more intense levels of support, although beneficial in facilitating the likelihood of quitting, is not essential to the success of NRT. The use of nicotine chewing gum or transdermal nicotine patches during smoking cessation delayed weight gain until nicotine replacement therapy was stopped (220, 221). However, neither nicotine gum nor the patch combined with smoking cessation provides any long-term benefit of attenuating weight gain (74).

Since nicotine can increase a baby's heart rate, a pregnant woman or nursing mother should seek the advice of a health professional before using an NRT. Furthermore, the product should not be used by anyone under the age of 18 years or who continues to use any other product that contains nicotine, such as tobacco or a nicotine patch. Side effects and complications associated with these products are similar to those found when smoking cigarettes and include irregular or rapid heartbeat, palpitations, nausea, vomiting, dizziness, and weakness. Persons with heart disease, recent heart attack, high blood pressure, stomach ulcer, taking insulin for diabetes and/or prescription medicine for depression or asthma should consult a physician prior to use (223).

Another pharmacotherapy used to aid smoking cessation is clonidine, which was originally approved to lower blood pressure. It acts on the central nervous system and may reduce withdrawal symptoms associated with tobacco cessation. In a Cochrane Review (224), randomized controlled trials of clonidine verses placebo with a smoking cessation endpoint were assessed at least twelve weeks following the end of treatment. Six trials met the inclusion criteria. Three trials of oral and 3 trials of transdermal clonidine were evaluated. Some form of behavioral counseling was offered to all participants in five trials. In one of these trials the pooled odds ratio for success with clonidine vs. placebo was 1.89 (95 percent CI 1.30-2.74). A high incidence of dose-dependent side effects was reported, particularly dry mouth and sedation. A recent study of clonidine in Thailand reported the same results (225).

There is evidence that the antidepressants fluoxetine and bupropion have a small effect on cessation and that other antidepressants might also be effective. No studies reported to date compare antidepressants to nicotine replacement therapy. Bupropion hydrochloride has increased quit rates in doses of 150 mg/d to 300 mg/d, but there is little evidence of effectiveness of clonidine, anxiolytic, benzodiazepines, or antidepressants on improving smoking cessation (158, 226).

Drugs used to reduce symptoms of anxiety and depression (buspiron, ondansetron, meprobamate, diazepam, the beta-blockers metoprolol, oxprenolol and propanolol, imipramine, fluoxetine, doxepin, moclobemide, tryptophan, bupropion, nortriptyline) were evaluated for smoking cessation. In a Cochrane Review (227), randomized trials which compared anxiolytic or antidepressant drugs to placebo or alternative therapeutic control were evaluated, excluding trials with less than 6 month follow-up. No evidence of effectiveness was noted for anxiolytics meprobamate, diazepam, oxprenolol, metoprolol, and buspirone.

Lobeline is a partial nicotine agonist (that is, it blocks the effect of nicotine), which has been used in a variety of commercially available preparations to help stop smoking. The rationale for its use in smoking cessation is that it may block the rewarding effect of nicotine and thus reduce the urge to smoke. In a Cochrane Review (228), no randomized trials were reported comparing lobeline to placebo or an alternative therapeutic control, which reported smoking cessation with at least six months follow-up. Gender differences were not evaluated.

TABLE 3. MEDICATIONS FOR SMOKING CESSATION

MEDICATION	DOSAGE	ADMINISTRATION
Nicotine polacrilex gum (Nicorette) (OTC)	2mg/piece if < 25 cigarettes per day 4mg/piece if ≥ 25 cigarettes per day	1 piece every 1 to 2 hr for 6 weeks, then 1 piece every 2 to 4 hr for 2 weeks, then 1 piece every 4 to 8 hr for 2 weeks, maximum 24 pieces per day
Nicotine nasal spray (Nicotrol NS) (Rx)	1-mg dose = 1 spray each nostril	1 to 2 doses per hour with maximum of 40 doses per day and maximum 3 months' use
Transdermal nicotine (Nicoderm CQ) (OTC) (Habitrol) (Rx)	21 mg per 24 hr 14 mg per 24 hr 7 mg per 24 hr	If > 10 cigarettes per day, 21 mg for 6 weeks, then 14 mg for 2 weeks, then 7 mg for 2 weeks. If < 10 cigarettes per day, 14 mg for 6 weeks, then 7 mg for 2 weeks.
(Prostep) (Rx)	22 mg per 24 hr 11 mg per 24 hr	If weight > 100 , pounds, 22 mg for 4 to 8 weeks, then 11 mg for 2 to 4 weeks. If weight < 100 pounds, 11 mg for 4 to 8 weeks.
(Nicotrol) (OTC)	15 mg per 16 hr	15mg/16 hours for 6 to 8 weeks
Bupropion hydrochloride SR (Zyban) (Rx)	150 mg	150 mg/d for 3 days, then 150 mg twice a day for 7 to 12 weeks (smoking quit date 1 to 2 weeks after beginning medication).

Source:(230)

An Arab pharmaceutical company developed and tested a mouthwash preparation for use as an aid to smoking cessation (229). Seventy-four male Jordanian healthy male smokers were given the A.S. mouthwash (active ingredient 0.5 percent silver nitrate) and 63 male smokers received a placebo solution in a double blind fashion. Mouth wash solutions were administered three times daily for two weeks; gargling lasted for a duration of one minute. When compared to the placebo, the smokers treated with the A.S. mouthwash showed a significant ($p < 0.05$) reduction in the number of cigarettes smoked.

The length of treatment for tobacco use cessation depends on many factors, including addiction to nicotine level and the presence or absence of co-morbidities. When designing programs, researchers should consider the duration of person-to-person treatment in weeks and the number of effective person-to-person treatment sessions.

Follow up assessments are important to evaluate effectiveness. These are also opportunities for "booster" sessions for the woman or girl who is trying to not relapse. Follow-up sessions can be used for relapse prevention, assessing the development of any co-morbidities, or any concerns about weight gain. This is especially true for women following childbirth.

Countries vary in their practices of reimbursement for tobacco use cessation. Some provide paid services through health insurance or managed care, and reimbursement for clinicians. Research is needed on the type of payment for tobacco use cessation and its effectiveness, especially for women.

Educational models for school, work, and home environments

School-based programs designed to prevent tobacco use or quitting can be an effective strategy worldwide (231). A number of prevention strategies are promising when coordinated with several other types of strategies, including aggressive media campaigns, teen smoking cessation programs, social environment changes, community interventions, and increasing cigarette prices. Three types of approaches have been most commonly used. The first approach before the mid-1970s was intended to arouse fear. These programs were ineffective in deterring initiation or reducing the number of current smokers. The second approach to youth tobacco prevention programs attempted to influence beliefs, attitudes, intentions, and norms related to tobacco use and enhancing self-esteem and values clarification. Interventions of this type were found to be insignificant. The third approach to tobacco prevention was based on a social influence resistance. This approach emphasizes the social environment such as peer behavior or attitudes and certain aspects of the environmental, familial, and cultural contexts. This type of intervention focuses on building skills needed to recognize and resist negative influences, including recognition of advertising tactics and peer influences, communication and decision-making skills, and assertiveness. In a meta-analysis of smoking prevention program evaluations published between 1974 and 1991, Rooney and Murray found that social influence programs could account for reductions in smoking between 5 and 30 percent (with the upper range given as the highest estimate of program performance under "optimal" conditions only) (232). In a meta-analysis of controlled studies of drug use prevention programs for youth, Tobler reported that interactive programs and those led by peers that addressed the social influences of substance use were most effective (233, 234). These findings were echoed by Black and colleagues (235), whose meta-analysis suggested that interactive peer interventions for middle school children are superior to non-interactive, didactic programs led by researchers or teachers. In another meta-analysis of smoking prevention programs for adolescents, the Center for Disease Control in the United States has developed guidelines for school health programs to prevent tobacco use and addiction (236). The following is a summary of their recommendations: Schools should

1. Develop and enforce a school policy on tobacco use;
2. Provide instruction about the short- and long-term negative physiologic and social consequences of tobacco use, social influences on tobacco use, peer norms regarding tobacco use, and refusal skills;
3. Provide tobacco-use prevention education in kindergarten through 12th grade;
4. Provide program-specific training for teachers;
5. Involve parents or families in support of school-based programs to prevent tobacco use;
6. Support cessation efforts among students and all school staff who use tobacco;
7. Assess the tobacco-use prevention program at regular intervals for effectiveness.

Some of the school-based programs which have been evaluated are *Know Your Body* (237), *Waterloo School Smoking Prevention Trial* (238), *Life Skills Training* (239), *Unpuffables Program* (240), *Heart Smart/Health*

Ahead (241), *SIBS* (242), and *CATCH* (243). A meta-analysis of adolescent smoking prevention programs concluded that school-based programs should consider adopting interventions with a social reinforcement, social norms, or developmental orientation (244). A Japanese review provided recommendations for improving methods to evaluate program effectiveness and determine future research strategies (245). These recommendations are 1) refine and standardize evaluation methods to make them valid and feasible for use in studies of Japanese adolescents; 2) improve study designs for evaluation of program effectiveness which include control groups and long term follow up; 3) apply smoking prevention programs which were demonstrated to be effective in the US and Europe; and 4) develop effective cessation programs for adolescent smokers. Finally, programs developed to prevent the initiation of tobacco use in schools need to address awareness of, and consider the nonverbal influences on, behavior diffusion, especially the distinctive differences between boys and girls (246).

Very few smoking cessation programs are designed specifically for youth. A few are have been developed for use school health clinics (247), but, more often, adult smoking cessation programs are tailored for young smokers. School-based health clinics are ideally suited for smoking cessation in adolescents, especially for pregnant girls who are tobacco users.

Work-based smoking cessation programs are convenient for busy professional women. Japanese researchers carried out a study in the Omihachiman (Japan) city office (248). Participants were randomly divided into intervention and control groups. The intervention group received five months of intensive education through group lectures and individual counseling. Comparison of smoking cessation rates between the two groups was performed at the end of the intervention period. Follow-up of all participants took place at six and 12 months after the intervention. After five months, the smoking cessation rate in the intervention group was 19.2 percent, compared to the control group at 7.4 percent.

A Cochrane Review evaluated self-help interventions for smoking cessation (249). Many smokers stop smoking on their own, although the actual number is unknown. The aims of the review were to determine the effectiveness of different forms of self-help materials, compared with no treatment and with other minimal contact strategies; the effectiveness of adjuncts to self-help, such as computer generated feedback, telephone hotlines and pharmacotherapy; and the effectiveness of approaches tailored to the individual compared with non-tailored materials. Studies included for the review were randomized trials of smoking cessation with follow-up of at least six months. Self-help was defined as structured programming for smokers trying to quit without intensive contact with a therapist. The main outcome measure was abstinence from smoking for at least six months of follow-up. Forty-five trials were identified; twenty-seven of the trials compared self-help materials to no intervention or tested materials as an adjunct to advice. In nine trials in which self-help was compared to no intervention, a pooled effect was reported which reached statistical significance (OR 1.23, 95 percent CI 1.02 to 1.49). No evidence showed a benefit from adding self-help materials to face-to-face advice or to nicotine replacement therapy. Evidence from eight trials using materials tailored for the characteristics of individual smokers showed that such personalized materials were more effective than standard materials (OR 1.41, 95 percent CI 1.14 to 1.75). Adding follow-up telephone calls from counselors also appeared to increase quitting (OR 1.62, 95 percent CI 1.33 to 1.97). One trial that offered access to a hotline also showed an effect. Self-help materials may provide a small increase in quitting compared to no intervention, although there is no evidence that they have an additional benefit over other minimal interventions, such as advice from a health care professional, or nicotine replacement therapy. Evidence does show that materials tailored for individual smokers, such as women, are more effective (249, 250).

DISCUSSION

There are several barriers for women and girls regarding tobacco cessation. The main barrier for tobacco use cessation for women and men is addiction to nicotine in tobacco. Withdrawal symptoms include a strong need to smoke, irritability, inability to concentrate and hunger. A positive association exists between the symptoms experienced and level of cigarette use. More females than males report smoking to relieve withdrawal symptoms.

In addition to addiction to tobacco, women and girls may have additional barriers that contribute to difficulty in quitting smoking. These are fear of weight gain, depression and other stressors such as childcare and poverty. Because of socio-cultural factors to be thin, many girls and women may dread being overweight or obese. About half of all adult women, both smokers and nonsmokers, say they are dieting. Women expect to gain weight when they quit smoking and evidence shows that they are correct to expect this. Women gain

more weight than men after cessation, either as a percentage of their initial weight or in absolute pounds. Some evidence supports the notion that attempting to prevent moderate weight gain after quitting has an opposite effect on continued abstinence rates. Furthermore, not all female smokers have the same concerns about weight, and not all quitters are equally susceptible to gaining weight after cessation. Most adult smokers (men and women) do not report 1) a relationship between smoking and weight, 2) use of smoking to control weight, 3) concern about weight gain after smoking cessation or (4) a previous relapse caused by weight gain during smoking cessation. Because of the modest effect of a mean 8- to 10-pound weight gain on health compared with that of smoking, patients should focus on smoking cessation and not controlling weight simultaneously. Perhaps changing attitudes about weight gain and body image—and not weight gain per se—is the best approach.

Another barrier for tobacco use cessation in women is depression. Depression is twice as common among American women as men (21.3 percent vs. 12.7 percent). Subgroups of women, such as minorities, women of low socioeconomic status, and women with less education have higher rates of depression. It is unclear if depression can cause cigarette smoking or cigarette smoking can cause depression. Childbirth, menstrual cycle, and menopause can be associated with depression and may even serve as triggers for an episode of major depression. Evidence is increasing that smoking and depression are associated more than would be expected by chance. Depression is four times more common among smokers than nonsmokers (60 percent vs. 15 percent). Hormones related to the reproductive cycle influence depression and smoking behavior. Women report using cigarette smoking for mood management and cigarettes as a coping mechanism and stress reliever. A history of depression and current depressive symptoms are independently associated with failure to quit smoking. Smoking cessation may change the balance of neurochemical modulators of moods. Depressed mood, anxiety, anger, irritability and fatigue are all symptoms which often peak within a few days after smoking cessation. Smoking cessation may provoke the onset of a depressive episode among smokers who may or may not have histories of major depression. When depressive symptoms emerge during withdrawal from nicotine, the likelihood is higher for both cessation failure and relapse. Furthermore, resumption of smoking can reverse depression symptoms. A significantly higher level of depression symptoms were reported among 16-year-old female smokers who attempted to quit, compared to males and nonsmoking females.

Nicotine replacement products and antidepressants are effective for smoking cessation for men and women. When combined with behavior therapy (either individual or group), cessation is more effective. The ideal tobacco use prevention and cessation programs for women and girls use multiple models, such as public health, educational, and clinical. It is essential for public health practitioners to address issues of starting to smoke and cessation of tobacco use among women and girls, along with the myriad adverse health effects that are gender-specific. The evidence points strongly to cessation and educational programs tailor-made to the needs of women and girls.

RECOMMENDATIONS

- All health care providers who have women or girl clients/patients who smoke should advise them to stop, provide a plan for stopping, and follow up for continued cessation.
- Pregnant tobacco users should be informed about health risks to themselves and to their baby. A plan for cessation should be provided and the prospective parents should be monitored for continued cessation. Special effort to monitor post-partum depression and cessation failure is vital to continued nonsmoking.
- For women and girls who are concerned about weight gain from smoking cessation, opportunities for lifestyle alterations in diet and exercise should be provided.
- Clinicians should monitor the presence of depressive symptoms prior to, during and after treatment for tobacco use cessation.
- More prospectively designed research studies are needed that elucidate the complexity of the relationships between failure to quit, nicotine withdrawal symptoms, level of addiction to nicotine, cigarette smoking relapse, depression, alcohol use, eating and fear of weight gain in girls and women.

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Smoking, Cessation and Pregnancy

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The organizing concept for this chapter is the partnership model, the building of partnerships between patients, public health policy-makers and providers of health care to ensure that the needed protection is provided. All World Health Organization (WHO) member states should consider patients and families the foundation reference group and the first component of a partnership philosophy. Multiple channels of communication and persuasion, including mass media and local and interpersonal methods, should be used to disseminate to prospective parents clear, strong messages about the substantial risks of active and passive tobacco smoke exposure to infants. Healthy babies, healthy parents and healthy families should be a primary theme of national, state and local tobacco control programmes.

Appropriate public health policy at the ministry, agency and program levels is the second component of a partnership philosophy. Political and public health leaders at the national, provincial and state levels set the agenda, define priorities and allocate resources to state and provincial agencies, health care organizations and maternity care services. Directors of health care and public health services for pregnant women or new parents need to examine critically existing agency policies and program structures related to smoking cessation and pregnancy and to modify the components wherever necessary.

Health care practitioners are the third component of the partnership model. Maternity and pediatric health care practitioners include physicians, nurses, midwives, social workers, health education specialists and community health workers at local facilities who interact with women and parents of childbearing age. These practitioners must provide to their patients who smoke a clear message about the serious risks of active (Figure 1) and passive smoke exposure and the benefits of smoking cessation. They need to routinely provide patients with evidence-based smoking cessation or harm reduction methods. All service providers need to examine their existing patient education structure, process and content and ask: “How am I helping my patients to change their smoking behavior? Am I providing the best clinical practice methods during the first maternity visit and later visits?”

METHODS

Using the above framework as a conceptual focus, this chapter presents a synthesis and discussion of the literature in six areas:

1. a global estimate of the prevalence of active and passive smoking among women of childbearing age (15 or older) and during pregnancy;
2. major risks of smoking for the fetus, infant and pregnant woman;
3. a meta-evaluation and meta-analysis of the effectiveness of smoking cessation and reduction methods during pregnancy;
4. a description of “Best Practice” clinical procedures for pregnant smokers, including suggestions for considering the use of nicotine replacement therapy during pregnancy;
5. cost analysis and cost-benefit estimates for cessation and reduction methods for pregnant smokers; and
6. organizational development strategies for integrating “Best Practice” principles and methods into national public health policies, maternity care systems and patient education programs.

ESTIMATED ACTIVE AND PASSIVE SMOKING PREVALENCE DURING PREGNANCY

The following discussion and the data shown in Table 1 (1) are crude estimates of current female and male smoking rates. Data from all prevalence surveys of pregnant females are typically more biased than those from the general female population, because 1) some

patients deny smoking during pregnancy because of social desirability factors; 2) self-reports are not confirmed by biochemical tests, and deception rates are unknown; 3) pregnant nonrespondents to prevalence surveys are more likely to be smokers; 4) some patients say that they have quit since becoming pregnant but have not, or they have relapsed during the pregnancy; and 5) survey samples are too small or not representative. Using the data from the 1997 WHO report, the number of pregnant smokers was estimated by multiplying the smoking prevalence rate among females (ages >15 years) by the annual number of births in each country. Multiple reports have indicated that smoking prevalence rates among females aged 15–25 years have consistently increased across the world and that rates have especially increased among 15- to 18-year-old females.

In addition, there are approximately 1 billion people in other countries for whom WHO did not report prevalence rates for males and females in their 1997 tobacco control monograph (2). This nonsurveyed population would contribute an estimated 30 million additional births per year. Assuming an average smoking prevalence of 12.0 percent among women aged >15 years out of the 30 million females, this uncounted cohort would contribute an estimated additional 3.6 million pregnant smokers, resulting in a total crude estimate of 15.0 million or more. Among the pregnant smokers, several studies have documented that approximately 10–20 percent or 1–2 million females may quit smoking upon becoming aware of their pregnancy, before or soon after entry into prenatal care (if prenatal care is available). Thus, the crude estimated number of females who smoked during their pregnancy in 1995 was approximately 12–14 million worldwide (Table 1).

Estimates of passive smoke exposure during pregnancy are less precise than the crude estimates of active exposure. The amount and intensity of regular passive exposure of pregnant women from their husbands, other males, and female family and friends is considerable. For example, in China, with 20 million births per year and a male smoking rate of 65 percent, and in India, with 22 million births per year and a male smoking rate of 40 percent, the total estimated numbers of infants who are passively exposed each year is >12 million (China) and >9 million (India). Because the male smoking rate is consistently much higher than the female rate in every country, the number of females passively exposed during pregnancy among the 130 million annual births is estimated to be 50 million or more. Thus, the number of infants who have been regularly exposed to tobacco smoke during pregnancy by a mother and/or at least one other smoker in the home appears to be at least 50 million.

RISKS OF SMOKING TO THE MOTHER, FETUS, INFANT, AND CHILD

Substantial risks of active and passive smoking during pregnancy to maternal and fetal health have been thoroughly documented since the landmark report by Simpson in 1957 (3). Perinatal morbidity and mortality are associated with active and passive smoking. There are also adverse effects on health outcomes beyond the perinatal period, such as reduced lung function and impairment of cognitive development. However, studies in these latter areas are not consistent. The major adverse sequelae which have been established as effects of smoking are reviewed below. These topics receive in-depth treatment elsewhere in this volume.

Infant Birth Weight and Morbidity

A clear, strong dose-response relationship exists between the number of cigarettes smoked during pregnancy and birth weight (4-8). Compared with nonsmokers, light and heavy smokers have 54 percent and 130 percent increases, respectively, in the prevalence of newborns weighing less than 2,500 g (low birth weight) and an average decrease in birth weight of 200–250 g. The effects on growth appear to be the result of intrauterine fetal hypoxia from increased levels of carbon monoxide in the blood, reduction of blood flow and inhibition of respiratory enzymes. A review of five studies representing 113,000 births in the United States, Canada, and Wales found that 21 percent of low birth weight (LBW) births could be attributed to maternal cigarette smoking. Smoking is a more significant determinant of infant birth weight and fetal growth than the mother's prepregnancy height, weight, parity, previous pregnancy outcomes or the infant's sex. Smoking cessation or a significant reduction (>50 percent) in tobacco exposure prior to or during pregnancy can significantly increase infant birth weight (9-15).

Fetal and Perinatal Mortality

Kleinman et al., in 1988, used 360,000 births (1979–1983) to study the relation between maternal smoking and fetal/infant mortality (9). The infant mortality rates (adjusted for age, parity, education and marital status) were (per 1,000 subjects) 15 for white nonsmokers, 19 for whites who smoked less than 1 pack of cigarettes per day, and 23 for whites who smoked more than 1 pack of cigarettes per day. For black women who did not smoke, the infant mortality rate (per 1,000

TABLE 1. ESTIMATED NUMBER OF PREGNANT SMOKERS BY COUNTRY

Country (year)	Pop 1998 (1,000)	Female(%) (15+)	Male(%) (15+)	Birth Rate (1,000)	Births (1,000)	Pregnant Smokers (1,000)
Denmark (1993)	5,270	37.0	37.0	13.0	69	25.3
Norway (1994)	4,419	35.0	36.4	13.4	59	20.7
Czech republic (1994)	10,282	31.0	43.0	10.7	110	34.1
Fiji (1988)	796	30.6	59.3	22.6	18	5.5
Russia Federation (1993)	147,434	30.0	67.0	9.6	1,415	424.6
Israel (1989)	5,984	30.0	45.0	20.3	121	36.4
Poland (1993)	38,718	29.0	51.0	11.9	461	133.6
Netherlands (1994)	15,678	29.0	36.0	11.9	187	54.1
Canada (1991)	30,563	29.0	31.0	11.9	364	105.5
Papua New Guinea (1990)	4,600	28.0	46.0	32.3	149	41.6
Ireland (1993)	3,681	28.0	29.0	13.0	48	13.4
Iceland (1994)	276	28.0	31.0	16.5	5	1.3
Greece (1994)	10,600	28.0	46.0	10.0	106	29.7
Hungary (1989)	10,116	27.0	40.0	10.2	103	27.9
France (1993)	58,683	27.0	40.0	11.6	681	183.8
Austria (1992)	8,140	27.0	42.0	16.2	132	35.6
Uruguay (1990)	3,289	26.6	40.9	16.8	55	14.7
U.K. (1994)	58,649	26.0	28.0	11.9	698	181.5
Switzerland (1992)	7,299	26.0	36.0	10.9	80	20.7
Slovakia (1992)	5,377	26.0	43.0	11.7	63	16.4
Luxembourg (1993)	422	26.0	32.0	12.7	5	1.4
Italy (1994)	57,369	26.0	38.0	9.1	522	135.7
Brazil (1989)	165,851	25.4	39.9	19.6	3,251	825.7
Chile (1990)	14,824	25.1	37.9	19.9	295	74.0
Spain (1993)	39,628	25.0	48.0	9.7	384	96.1
Cuba (1990)	11,116	24.5	49.3	13.1	146	35.7
Turkey (1988)	64,479	24.0	63.0	21.9	1,412	338.9
Sweden (1994)	8,875	24.0	22.0	11.9	106	25.3
Estonia (1994)	1,429	24.0	52.0	9.0	13	3.1
Slovenia (1994)	1,993	23.0	35.0	9.5	19	4.4
Argentina (1992)	36,123	23.0	40.0	19.9	719	165.3
U.S.A. (1993)	274,028	22.5	27.7	13.8	3,782	850.9
New Zealand (1992)	3,796	22.0	24.0	15.4	58	12.9
Germany (1992)	82,133	21.5	36.8	9.3	764	164.2
Bolivia (1992)	7,957	21.4	50.0	33.2	264	56.5
Australia (1993)	18,520	21.0	29.0	14.3	265	55.6
Costa Rica (1988)	3,841	20.0	35.0	24.0	92	18.4
Colombia (1992)	40,803	19.1	35.1	23.4	955	182.4
Finland (1994)	5,154	19.0	27.0	12.0	62	11.8
Belgium (1993)	10,141	19.0	31.0	11.2	114	21.6
Samoa (1994)	174	18.6	53.0	26.7	5	0.9
Malta (1992)	384	18.0	40.0	14.2	5	1.0
Guatemala (1989)	10,801	17.7	37.8	36.3	392	69.4
South Africa (1995)	39,357	17.0	52.0	29.7	1,169	198.7
Bulgaria (1989)	8,336	17.0	49.0	10.3	86	14.6
Portugal (1994)	9,869	15.0	38.0	11.2	111	16.6
Bangladesh (1990)	124,774	15.0	60.0	26.8	3,344	501.6
Japan (1994)	126,281	14.8	59.0	10.3	1,301	192.5
Mexico (1990)	95,831	14.4	38.3	24.6	2,357	339.5
Dominican Republic (1990)	8,232	13.6	66.3	24.1	198	27.0
Peru (1989)	24,797	13.0	41.0	24.9	617	80.3
Jamaica (1990)	2,538	13.0	43.0	21.7	55	7.2
Latvia (1993)	2,424	12.0	67.0	9.8	24	2.9
Kuwait (1991)	1,811	12.0	52.0	21.3	39	4.6
El Salvador (1988)	6,032	12.0	38.0	27.9	168	20.2
Honduras (1988)	6,147	11.0	36.0	33.5	206	22.7
Lithuania (1992)	3,694	10.0	52.0	10.8	40	4.0
Algeria (1980)	30,081	10.0	53.0	29.2	878	87.8
Morocco (1990)	27,377	9.1	39.6	25.3	693	63.0
Swaziland (1989)	952	8.0	33.0	36.8	35	2.8
Philippines (1987)	72,944	8.0	43.0	28.4	2,072	165.7
Albania (1990)	3,119	7.9	49.8	21.4	67	5.3
Cyprus (1990)	771	7.2	42.5	16.2	12	0.9
Mongolia (1990)	2,579	7.0	40.0	27.8	72	5.0
China (1984)	1,255,698	7.0	61.0	16.2	20,342	1,424.0
Republic of Korea (1989)	46,109	6.7	68.2	15.0	692	46.3
Nigeria (1990)	106,409	6.7	24.4	42.3	4,501	301.6
Bahrain (1991)	595	6.0	24.0	21.0	12	0.7
Paraguay (1990)	5,222	5.5	24.1	31.3	163	9.0
Iraq (1990)	21,800	5.0	40.0	36.5	796	39.8
Pakistan (1980)	148,166	4.4	27.4	36.1	5,349	235.3
Thailand (1995)	60,300	4.0	49.0	16.7	1,007	40.3
Malaysia (1986)	21,410	4.0	41.0	25.2	540	21.6
Indonesia (1986)	206,338	4.0	53.0	23.1	4,766	190.7
Mauritius (1992)	1,141	3.7	47.2	19.3	22	0.8
India (1980)	982,223	3.0	40.0	25.2	24,752	742.6
Singapore (1995)	3,476	2.7	31.9	15.7	55	1.5
Uzbekistan (1989)	23,574	1.0	40.0	28.2	665	6.6
Lesotho (1989)	2,062	1.0	38.3	35.4	73	0.7
Egypt (1986)	65,978	1.0	39.8	26.1	1,722	17.2
Sri Lanka (1988)	18,455	0.8	54.8	17.8	328	2.6
Turmenistan (1992)	4,309	0.5	26.6	28.6	123	0.6
Saudi Arabia (1990)	20,181		52.7	34.3	692	0.0
Total	4,881,087	16.9	42.1			9,403
Other Countries	1,019,967	12.0		19.8	20,184	2,422
Grand Total	5,901,054	10.7				11,825

Sources : (1,2)

women) was 26; for blacks who smoked less than 1 pack per day, it was 32; and for blacks who smoked more than 1 pack per day, it was 40. The increases were seen in neonatal mortality, which is related to low birth weight, as well as in the postneonatal period. Mortality was also increased during the fetal periods. If all pregnant women in the United States stopped smoking, the number of fetal and infant deaths would be reduced by approximately 10 percent each year. However, as will be discussed later in this chapter, smoking cessation programs are unlikely to achieve this level of success, and efforts at preventing initiation of smoking among young women must be emphasized. Epidemiologic studies indicate that maternal smoking is associated the majority of sudden infant death syndrome (SIDS) cases: it doubles the risk of SIDS (16-19). The relation between smoking and SIDS is stronger than that seen with any other drug of abuse.

In 1981, Stein et al. compared women who experienced a spontaneous abortion to women who carried their pregnancy to 28 weeks or more (20). The odds of a spontaneous abortion increased by 46 percent for the first 10 cigarettes smoked per day and by 61 percent for the first 20 cigarettes smoked per day. Smoking was not associated with the spontaneous abortion of chromosomally abnormal conceptions, only with those in which the chromosomes were normal. These results were not confounded by factors such as maternal age or race.

Respiratory Health

The US Environmental Protection Agency (EPA) has classified environmental tobacco smoke as a Group A Carcinogen. The EPA, the Surgeon General and the National Research Council also found definite evidence for adverse health effects other than cancer, including substantial increases in respiratory illness, decreased lung function and increased ear infections, among children of mothers who smoked. Cigarette smoking is the principal cause of infant respiratory diseases (21-27). Maternal smoking and/or passive smoke exposure during pregnancy and/or infancy (ages <1 year) may produce long-term, potentially irreversible decrements in infant lung function (21-27).

HEALTH EDUCATION METHODS FOR PREGNANT SMOKERS

The following is a comprehensive assessment of the evaluation studies of the efficacy of patient education methods for pregnant smokers. The first section discusses patient education methods that have been evaluated, and the second presents a meta-analysis of completed studies. It answers the question, What are effec-

TABLE 2. META-EVALUATION OF SMOKING CESSATION METHODS IN PREGNANCY: 1970-1987

#	PRINCIPLE INVESTIGATOR	LOCATION	DESIGN	SAMPLE SIZE	METHODS	SMOKING MEASUREMENT	QUITRATE (%)
1	Donovan (1972-73)	England	Exp.	E=263 C=289	OB Advice+	Self-Report	Not Reported
2	Baric (1975)	England	Exp.	E=63 C=47	OB Brief Advice	Self-Report	E=14% C=4%
3	Loeb (1978-81)	U.S.	Exp.	E=500 C=500	H.Ed. 6groupSessions	Self-Report	E=15% C=14%
4	Ershoff (1980-81)	U.S.	Exp.	E=57 C=72	H.Ed.+ 8 Mailed Books	Self-Report+ Urine SCN	E=28% C=14%
5	Bauman* (1981)	U.S.	Exp.	E=36 C=43	H.Ed.+ CO Feedback	Self-Report+ CO	E=6% C=3%
6	Burling (1983)	U.S.	Exp.	E=105 C=104	H.Ed.+ CO Information	Self-Report+ CO	E=10% C=3%
7	Sexton* (1979-83)	U.S.	Exp.	E=388 C=395	RN Counseling +Telephone	Self-Report+ Saliva SCN	E=27% C=3%
8	Windsor* (1982-84)	U.S.	Exp.	E_1=103 E_2=102 C=104	H.Ed. Self-Help Guide	Self-Report+ Saliva SCN	E_1=14% E_2=6% C=2%
9	Lilley (1986)	England	Exp.	E=74 C=73	OB Advice	Self-Report + Pamphlet	E=5.4% C=1.4%
10	McArthur (1987)	England	Exp.	E=493 C=489	OB Advice	Self-Report	E=9.0% C=6.0%

* Strong Evaluation Methods
Source:(29)

tive, "Best Practice" methods that health care providers could routinely deliver to a patient who admits to smoking at her first prenatal care visit? In the third section, a description of "Best Practice" health education methods is presented.

Meta-Evaluation of Smoking Cessation Methods in Maternity Care

Evaluation studies conducted in the United States, Australia, Canada, England, Norway, and Sweden have confirmed that if a specific set of patient education procedures is routinely delivered by a trained professional, regardless of his/her specialty—physician, nurse, midwife, or health educator—cessation rates and reduction rates among pregnant smokers can be significantly increased above the normal quit rates. The following is a meta-evaluation of the quality of these studies. Meta-evaluation (ME) is defined as a systematic review of experimental and quasi-experimental evaluation research using a standardized set of methodological criteria to rate the internal validity (efficacy or effectiveness) of intervention results (28, 29). ME answers the questions: 1) How well was an evaluation study conducted? 2) What were the methodological problems and potential biases in the reported results? and 3) Were the study results and conclusions valid or invalid? Windsor and Orleans, in 1986 (28), published a meta-evaluation (ME I) of smoking cessation evaluation research among

TABLE 3. META-EVALUATION OF SMOKING CESSATION METHODS IN PREGNANCY: 1988-1992

#	Principle Investigator	Location	Design	Sample Size	Methods	Smoking Measurement	Quit Rate (%)
11	Gilles (1988)	England	Quasi-Exp.	E=450 C=390	RN-Mid-wife Advice+Groups	Self-Report	E=7.4% C=3.4%
12	Ershoff* (1989)	U.S.	Exp.	E=126 C=116	H.Ed.+7 Booklets Mailed WK	Self-Report+ Urine Cot.	E=22.2% C=8.6%
13	Messimer (1989)	U.S.	Exp.	E=57 C=60	OB+ Information	Self-Report	E=26.3% C=13.3%
14	Mayer (1990)	U.S.	Exp.	E1=72 E2=70 C=77	H.Ed.+SelfHelp Materials	Self-Report+ 1/3 SCN at Postpartum	E1=11.1% E2=7.1% C=2.6%
15	Haddow (1991)	U.S.	Exp.	E=1343 C=1357	OB+Self Help Methods+CO	Serum Cot.	E=7.9% C=Not Reported
16	Hjalmarson* (1991)	Sweden	Exp.	E=429 C=231	OB+ Self Help Guide	Self-Report+ Saliva SCN	E=12.6% C=5.0%
17	O'Connor* (1992)	Canada	Exp.	E=100 C=109	RN+ Self Help Guide	Self-Report+ Urine Cot.	E=12.0% C=5.0%
18	Price (1992)	U.S.	Exp.	E1=71 E2=52 C=70	H.Ed+2Videos +SelfHelpBook	Self-Report+ CO	E1=5.6% E2=3.8% C=1.4%
19	Rush (1992)	England	Quasi-Exp.	E=175 C=144	Phy.+ HomeVisit	Self-Report CO	E=10.4% C=5.4%
20	King (1992)	U.S.	Quasi-Exp.	E=951 C=211	RN+ SelfHelp Book	Self-Report	E=5.0% C=5.0%
21	Petersen (1992)	U.S.	Exp.	E=71 C=78	RN+ SelfHelp Book	Self-Report+ Urine Cot.	E=19% C=18%

* Strong Evaluation Methods
From (29).

TABLE 4. META-EVALUATION OF SMOKING CESSATION METHODS IN PREGNANCY: 1993-2000

#	PRINCIPLE INVESTIGATOR	LOCATION	DESIGN	SAMPLE SIZE	METHODS	SMOKING MEASUREMENT	QUITRATE (%)
22	Windsor* (1993)	U.S.	Exp.	E=400 C=414 C=100	H.Ed+ SelfHelp Guide	Self-Report+ Saliva Cot.	E=14.3% C=8.5% C=3.0%
23	Secker-Walker* (1994)	U.S.	Exp.	E=188 C=226	OB/RN+ Counseling	Self-Report+ Urine Cot.	E=14% C=11%
24	Valbo* (1994)	U.S.	Exp.	E=54 C=50	OB+ SelfHelp Guide	Self-Report+ Significant Other	E=20% C=4%
25	Kendrick* (1995)	U.S.	Exp.	E=1467 C=1767	RN+ Information	Self-Report+ Urine Cot.	E=3.0% C=3.0%
26	Lillington* (1995)	U.S.	Quasi-Exp.	E=79 C=146	WIC+Self Help Methods	Self-Report	E=12% C=12%
27	Hartmann* (1996)	U.S.	Exp.	E=107 C=100	OB+ Self Help Guide	Self-Report+ CO	E=20% C=10%
28	Gielen* (1997)	U.S.	Exp.	E=125 C=121	H.Ed.+ Self Help Guide	Self-Report+ Saliva Cot.	E=6.0% C=5.6%
29	Walsh* (1997)	Australia	Exp.	E=127 C=125	OB/RN+Video+ SelfHelp Manual	Self-Report+ Urine Cot.	E=12% C=0%
30	Lowe* (1992)	Australia	Exp.	E=44 C=34	RN+Magazine Booklet	Self-Report+ Urine Cot.	E=9% C=0%
31	Gebauer* (1998)	U.S.	Quasi-Exp.	E=84 C=94	RN+ SelfHelp Guide	Self-Report+ Saliva Cot.	E=16% C=0%
32	Windsor* (2000)	U.S.	Exp.	E=138 C=127	RN+ or SW SelfHelp Guide	Self-Report+ Saliva Cot.	E=17% C=9%

*Strong Evaluation Methods
Studies 22-31 from (29).
Study 32 from (34).

pregnant women. In 1998, Windsor, Boyd, and Orleans (29) published a second meta-evaluation (ME II) of smoking cessation intervention research among pregnant women from 1986 to 1998. Five criteria were used to rate the smoking cessation intervention studies among pregnant smokers in prenatal care: 1) evaluation research design, 2) sample representativeness, sample size and power estimation, 3) population characteristics, 4) measurement quality and 5) replicability of interventions. ME I and ME II, in conjunction with reviews by Walsh and Redman in 1993 (30), Mullen et al. in 1994 (31), Edwards et al. in 1996 (32), Lumley et al. in 1999 (the Cochrane Collaboration) (33), and Windsor et al. in 2000 (34), provide a complete assessment of this area of evaluation research.

Tables 2, 3 and 4 present a synthesis of the results from ME I and ME II. Table 2 includes studies done from 1970 to 1987 (29); Table 3, studies from 1988 to 1992 (29); and Table 4, studies from 1993 to 1999 (29, 34). Only 16 of the 32 were strong evaluation studies. These two meta-evaluations and the original studies should be thoroughly reviewed by future planners and evaluators of patient education programs for pregnant smokers. Future evaluation studies must address the multiple problems and issues noted in ME I and ME II.

Meta-Analysis of Effective Patient Education Methods

As a follow-up to the methodological reviews of the evaluations, a meta-analysis of the 32 studies was also performed to document the evidence base for patient education methods for this high-risk population. Only evaluation studies which met the following three criteria are included in this meta-analysis: 1) documentation of exposure group (E) versus control group (C) baseline comparability, 2) independent confirmation of E and C group patient self-reports of smoking status, and 3) documentation of a significantly higher E group cessation rate in comparison with the C group rate, with the objective of defining the most effective methods. The 10 studies out of 32 that met the three criteria are presented in Table 5 (29, 34-43). For studies that reported a "0 percent" quit rate among control patients, the risk ratio could not be calculated.

The first eight studies shared three salient characteristics: 1) each translated and adapted the *Pregnant Woman's Self Help Guide to Quit Smoking* (Windsor et al., 5th edition, 1998) (44) to their language, patient population and prenatal care setting; 2) each confirmed the feasibility of routine delivery of the Guide to

patients by different, trained providers of maternity services; and 3) all nine documented a higher cessation rate in the *E* group than in the *C* group. The combined risk ratio (RR) and *E* and *C* group quit rates for the nine studies in Table 2 were as follows: RR = 2.9; E group (1,567 patients), 15.1 percent; C group (1,069 patients), 5.3 percent. On the basis of this evidence and the US Agency for Health Care Policy and Research guideline published in 1996 (45), a tailored self-help guide provided by trained clinical staff should be the standard patient education procedure for pregnant smokers.

Evidence-Based Clinical Practice Procedures for Pregnant Smokers: "Best Practice"

The following is a detailed description of evidence-based patient education methods for pregnant women upon entry into maternity care. A"Best Practice" example is presented here using the Smoking Cessation or Reduction in Pregnancy Treatment (SCRIPT) Model derived from the 1996 Agency for Health Care Policy and Research guideline, ME I, ME II, and the meta-analysis shown in Table 5. Patient smoking addiction treatment methods can be organized into four clinical practice behaviors: ASK; ADVISE; ASSIST; and ARRANGE. The ten health education procedures from the SCRIPT Model to be provided by maternity care staff to all patients who smoke are described in Figure 1.

At their first maternity visit, all patients should have their tobacco use status assessed by self-report (ASK). All patients, regardless of smoking status, should be informed of the serious health risks to mother, fetus, and infant and should receive a strong, clear personal message to quit smoking (ADVISE). In addition to Ask and Advise, patients should be provided with a multi-component patient education program (ASSIST/ ARRANGE) by a trained provider as part of routine care.

Component #1: The *"Commit to Quit Smoking—During and After Pregnancy"* video (46) is an example of the type of method to be provided to each patient. The purposes of the video are to enhance motivation to quit, to ensure exposure to recommended cessation methods, and to significantly reduce counseling time by clinical staff. The video presents three salient motivational concepts: 1) strong visual and personal verbal messages about maternal, fetal and infant risk, 2) promotion of positive self-efficacy and outcome expectations by testimonials of pregnant smokers who have quit and 3) demonstration of behavioral skills needed to quit. Having been Asked and Advised, and after receiv-

FIGURE 1. SCRIPT: BRIEF CESSATION COUNSELING FOR PREGNANT SMOKERS*

PROCEDURE	COMPLETED
ASK < 1 minute	
1. Document smoking status and cigarettes per day (cpd):	❑
A.Never smoker ❑ C.Quit since pregnant ❑	
B.Quit before pregnant ❑ D.Smoker: reduced cpd ❑	
Response A-B-C:Congratulate her on success—stop home & social ETS exposure Response D-E:ADVISE,ASSIST and ARRANGE	
ADVISE < 1 minute	
2. Provide clear, strong messages about risks of smoking to mother/fetus	❑
3. Provide clear, strong and personal advice to quit and stay quit	❑
ASSIST > 3 minutes+	
4. Provide "Commit to Quit" Video	❑
5. Provide "A Pregnant Woman's Guide to Quit Smoking"	❑
6. Review cessation skills in Video-Guide and develop a specific quit plan	❑
7. Express confidence that use of Guide and methods will help to quit	❑
8. Encourage patient to seek family & social support and stop ETS	❑
ARRANGE < 1 minute	
9. Remind patient of next visit and put "smoking as vital sign" label in chart	❑
10.Assess status during pregnancy:if a smoker, encourage cessation	❑

Source:(29,45)

TABLE 5. A META-ANALYSIS OF EFFECTIVE PATIENT EDUCATION METHODS IN PREGNANCY

STUDY(REF)	YEAR	SITE	PROVIDER	CESSATION RATES			
				E GROUP% (N)	C GROUP% (N)	RISK RATIO	95% CI
Windsor et al (34)	(2000)	Alabama	RN/SW	17 (139)	9 (126)	2.0	(1.0,3.9)
Gebauer et al (35)	(1998)	Ohio	RN	16 (84)	0 (94)	--	---
Hartmann et al (36)	(1996)	North Carolina	MD(OB)	20 (107)	10 (100)	2.0	(1.0,4.0)
Valbo, et al.(37-38)	(1994)	Norway+	MD(OB)/RN	25 (161)	8 (155)	3.2	(1.8,6.0)
Windsor et al (39)	(1993)	Alabama	Health Educator	14 (400)	3 (100)	4.7	(1.5,14.6)
O'Conner et al (40)	(1992)	Canada	RN	12 (101)	5 (101)	2.4	(0.9,6.6)
Hjalmarson et al (41)	(1991)	Sweden	MD(OB)	13 (417)	8 (231)	1.7	(1.0,2.8)
Windsor et al (42)	(1985)	Alabama	Health Education	14 (102)	2 (104)	7.1	(1.7,30.6)
Walsh et al (43)	(1997)	Australia	RN/MD(OB)	12 (127)	0 (125)	--	--
Sexton et al (44)	(1984)	Maryland	RN	27 (395)	3 (388)	8.7	(4.9,15.6)

+ Combines data from two studies

ing a brief (1-minute) overview about the purposes of the patient education program, the patient should privately view the video (ASSIST). Because a large percentage of smokers live with one or more other smokers, a program might include the option of lending the patient the video to take home to help in establishing a smoke-free home.

Component #2: *The Pregnant Woman's Self-Help Guide to Quit Smoking* is a tailored smoking cessation guide written on a 5th/6th grade reading level. The Guide presents a self-directed 7-day quitting plan that teaches patients 12 problem-solving and coping skills related to smoking cessation (ASSIST). This plan is given to each patient to review while she is watching the video. The Social Learning (Cognitive) Theory (47) was used as the conceptual framework in developing the Guide (1st through 5th editions).

Component #3: *Patient-Centered Counseling Procedures* After a patient watches the video and concurrently reviews Day 1 of the Guide, she should receive *Component #3,* a 5-minute (or less) patient-centered counseling session (48, 49). This component (ASSIST) is also designed to increase motivation and to help the patient prepare a personal action plan for quitting. Using a semi-structured patient interaction form, the patient and health care provider briefly review the risks of smoking and the rewards of quitting, clarify concerns, and discuss what the patient has learned from the video and the Guide. Each patient is encouraged to: 1) describe her "preparation" plans (dates, times and actions) for quitting; 2) specify when she will use the Guide to begin the cessation process; 3) set a quitting date; and 4) sign a written agreement to use the Guide. A chart reminder form (color-coded) should be placed in patients'records to prompt staff to assess their smoking status at each subsequent maternity visit (ARRANGE). After a patient has received the SCRIPT Model, prenatal care staff will, at the next visit, ASK about her smoking status.

Use of Nicotine Replacement Therapy (NRT)

Nicotine replacement therapy (NRT) and other pharmacotherapies combined with behavioral methods are the most effective treatment procedures for assisting smokers to quit (50-53). NRT products can be purchased over the counter in the United States. At present, there are few safety and efficacy studies on the use of NRT with pregnant women. In 1991, Benowitz (54) concluded that the benefits of NRT in helping patients quit during pregnancy outweighed the risk of smoking for many patients who cannot stop after the provision of behavioral methods. A heavy smoker was defined as a patient who smoked 20 or more cigarettes per day. Benowitz noted that the daily dose of nicotine and peak blood levels of nicotine from NRT gum or a NRT patch are lower than those of a one-pack-per-day cigarette smoker. Because of reduced nicotine exposure and elimination of carbon monoxide and 4,000 other toxic substances in cigarette smoke, Benowitz asserted that NRT would be less harmful for almost all pregnant smokers who smoke more than 20 cigarettes daily. The evidence about maternal-dose formulation was examined in a recent comprehensive review of the literature by Little (55). Little found that only two studies synthesized pharmacokinetic data into guidelines for individual clinical regimens. Guidelines for doses or scheduling of doses were lacking in medical practice and in the pharmacokinetic literature. More clinical studies of nicotine

replacement among pregnant smokers need to be formally conducted in order to document the safety, dose, scheduling, and efficacy of NRT in pregnant women.

In one of the few NRT studies conducted among humans to examine the safety and effectiveness of nicotine gum, plasma cotinine levels were significantly lower from gum-chewing than from smoking (56). Nicotine concentrations and hemodynamic effects were also less than in patient smoking. These data suggested that short-term nicotine gum use is likely to be safer than smoking during pregnancy for a woman who is unable to quit. It also eliminates carbon monoxide exposure, which may be the causal agent in reducing birth weight. Two recent studies carried out among small samples of patients by Wright (57) and Ogburn (58) also examined the short-term effects of the nicotine replacement patch with healthy pregnant smokers. Both investigators reported no adverse maternal or fetal effects from the use of nicotine patch relative to smokers. The study by Wright et al.(56) also found that concentrations of salivary cotinine levels were consistently lower than those seen among nonpregnant adult smokers.

Suggested Criteria for NRT Use During Pregnancy

If a patient has not quit smoking or significantly reduced her intake after exposure to "Best Practice," a physician may then consider either providing additional verbal encouragement to quit or recommending the use of NRT. Based on the current, limited evidence and expert opinion noted in the literature (59), a minimum of five questions should be considered by a physician in making a recommendation for NRT to a pregnant smoker:

1. Has the patient been provided "Best Practice" (e.g., SCRIPT) methods yet did not quit?
2. Has the patient reported smoking more than 10 cigarettes per day?
3. Does the patient smoke her first cigarette within the first 60 minutes of getting up?
4. Has the patient indicated that she wants to quit?
5. Is the fetus's gestational age less than 20 weeks?

Ultimately, the decision to discuss and recommend the use of NRT with a pregnant smoker should be made by the physician and the patient.

The Economic Burden of Smoking in Pregnancy

Active tobacco exposure, combined with passive exposure, is a direct cause of maternal, fetal, infant, and child morbidity and mortality. Although the costs of active and passive tobacco exposure in pregnancy are not available for each country or worldwide, estimates for the United States confirm that costs are extraordinarily high. The smoking-attributable costs for all complications at birth for the United States in 1995 were estimated by Adams et al. to be $1.4 billion (60). This estimate is conservative and omits a number of specific smoking-attributable costs, such as the indirect costs related to infant mortality and infant morbidity. If this estimate were adjusted by a 5 percent per year inflation rate for medical care costs (obtained from the US Bureau of Labor Statistics), costs for the year 2000 would be approximately $2 billion. If we combine this $2 billion cost with a 5 percent inflation-adjusted cost of medical care of $4.6 billion (1993) for lifelong medical care expenditures for infants with problems caused by tobacco exposure, the total annual excess costs for the United States in the year 2000 may be as high as $8 billion (61).

Cost Analysis-Cost Benefit of "Best Practice" Methods

The following discussion examines two dimensions of cost that are important pubic health policy and program issues: 1) how much does it cost to deliver evidence-based patient education methods for pregnant smokers?; and 2) what is the cost-benefit? Cost-benefit analyses examine the extent to which the "Best Practice" methods are more effective (larger behavioral-clinical impact) than usual information and compares the benefit (savings projected to be achieved) with the costs of delivering methods (62-64).

Costs of "Best Practice"

The principal resources expended to deliver the "Best Practice" treatment presented in Figure 1 are personnel and health education materials (64). No costs for the use of facilities are estimated in the analyses, because the methods would be applied during normal clinic hours and would not produce incremental or differential facilities costs. The agency perspective is used for this analysis. While a physician will ASK and ADVISE, a nurse/midwife, social worker, or health educator is the most likely person to provide "Best Practice" smoking cessation methods (ASSIST in the SCRIPT Model). Staff costs vary from country to country by type of per-

sonnel and by level of training. Assuming a low average US nurse's wage for the year 2000 of $36,000 with 20 percent fringe benefits, $43,200 per nurse per year would be the potential costs, and the hourly rate would be approximately $20.00. The time required during the first visit to educate a pregnant smoker is about 5–7 minutes. At least two brief follow-up contacts would typically be provided, requiring approximately 2 minutes, for a minimum total of 8 minutes. The cost of *Pregnant Woman's Self Help Guide to Quit Smoking* would be $3.25 each if 3,000 copies are purchased. Thus, the total costs per patient would be $6.00. Compared with other prenatal care procedures, this "Best Practice" model is very inexpensive and is easily absorbed as part of the overall reimbursement fee for maternity care in most countries. The cost of dissemination of "Best Practice" would only be about $5 million per year for the estimated 800,000 pregnant smokers in the United States (34, 64).

Cost Benefit Estimates of "Best Practice" Methods for Pregnant Smokers

To estimate the benefits (savings) of routinely providing "Best Practice" methods to pregnant smokers, the overall costs of low birth weight can be estimated: 1) hospitalization/physician costs at birth for an LBW infant, 2) rehospitalization costs in the first year for an LBW infant, and 3) long-term health care costs of treating an LBW infant/child. These estimates do not include the large number of infants exposed during pregnancy to other nicotine-producing products (e.g., bidis in India). Estimates from the US Institute of Medicine indicated that the cost of care for a single LBW infant was about $15,000 (low estimate) to $30,000 (high estimate) in 1990 (11). If we adjust these estimates for inflation, this cost would be approximately $25,000 (low) to $40,000 (high) per LBW infant in the year 2000.

We can estimate the potential impact of dissemination on the incidence of smoking attributable to low birth weight and estimate tobacco-attributable excess costs. The potential impact on the incidence of low birth weight and associated excess smoking-attributable LBW health care costs shown in Table 6 assumes that an additional 10,000 women quit and another 10,000 significantly reduce their tobacco exposure. Quit rates from informational methods are estimated to be 5 percent, and quit rates from "Best Practice" methods are estimated to be 15 percent.

Assuming a lower limit of 20 percent for smoking-attributable risk with a range of 20–30 percent, the estimated number of tobacco-attributable LBW births is 3,000 out of every 15,000. In theory, if smoking were eliminated during pregnancy among this cohort, all 3,000 LBW births attributable to smoking would be prevented. Routine use of "Best Practice" methods may achieve a smoking cessation rate of 15 percent as compared with a rate of 5 percent for usual practice. Thus, among the birth cohort of 3,000, "Best Practice" methods might reduce the risk by an additional 10 percent and the number of LBW infants by 300. Using an estimate of $25,000 cost per LBW infant, the total estimated excess medical costs for the prevention of low birth weight in the 300 infants would be about $7.5 million.

TABLE 6. ESTIMATED IMPACT OF DISSEMINATION OF THE SCRIPT MODEL METHODS TO A COHORT OF 100,000 PREGNANT MEDICAID SMOKERS +

TYPE OF IMPACT	LEVEL OF IMPACT
A.Behavioral	
1.Current Annual Cessation	5,000 (5%)
2. Potential Annual Cessation	15,000 (15%)
3. Potential Additional Annual Cessation	10,000 Patients
B.Low Birthweight Incidence	
1.Number of LBW Infants	15,000 (15%)
2.Smoking Attributable LBW	3,000 (20%)
3. Potential Preventable Smoking Attributable - LBW	300 (10%)
C.Economic Impact	
1.Excess Cost / Per LBW Prevented	$25,000
2. Total Cost / Per LBW Prevented	Low = $7,500,000
3. Total "Best Practice" Costs	$700,000 ($7 x 100,000)
4.Cost to Benefit Ratio	1:$10
5.Cost Savings	$7,000,000

+ Estimates do not include significant reduction

As was noted above, the "Best Practice" intervention cost is $6 per patient, or $600,000 for a cohort of 100,000 pregnant smokers. The cost-benefit ratio is computed by dividing the intervention cost ($600,000) into the estimated cost savings of $7 million ($1:$11). For each dollar invested in "Best Practice," approximately $11 might be saved. The possible cost savings in excess health care expenditures from routine delivery of "Best Practice" methods might be $7 million per year.

This information and methods can be used by individual countries to examine their smoking prevalence rates, smoking-attributable incidence rates for low birth

weight, and actual or estimated excess costs for low birth weight. With this information, sensitivity analyses can be performed, varying the costs of the "Best Practice" methods, the estimated impact on incidence of low birth weight and cost savings. However, a monetary cost-benefit analysis presents only one very limited dimension of the impact of smoking and smoking cessation on an infant, mother, or family. Because intervention costs for a well-developed health care system are insignificant (<$10), cost should not be a primary issue in creating a new policy.

Public Health Policy-Program-Parent Partnerships for Global Dissemination

How does a country define strategies to reduce risk and to improve the health of its next generation of citizens? As noted in the introduction, the organizing philosophy for planning a country-wide or system-wide change is *partnership.*

As Dr. Brundtland stated in the WHO monograph:

> *Tobacco control cannot succeed solely through the efforts of individual governments, national NGOs and media advocates. We need an international response to an international problem. I believe that response will be well encapsulated in the development of an international framework convention* (65).

All WHO member states must focus on a wide range of public policy and program activities, embracing the partnership principle of protecting mothers, infants, and children. The foundation partnerships for all WHO member states are between governments and patients and their families. An important step for each country in protecting its families would be to adopt enthusiastically the policies of the Framework Convention on Tobacco Control. Each country should use the Framework Convention as an international regulatory strategy with which to promote tobacco control actions. Support for this framework would translate into an examination of existing policies within ministries of health and within public and private sector health service providers.

Organizational and Policy Development

The second foundation component of this partnership philosophy is *public health policy.* Directors and planners of health care services for pregnant women or new parents need to critically examine their existing communication strategies, health policies, and program structures. A 21st century health policy should include multicomponent strategies to eliminate tobacco exposure during pregnancy for the entire family and home. Health care organizations and plans that fund and serve public or private members need to examine contract specifications, incentives, and performance expectations. An example is the Health Plan Employer Data and Information Set (HEDIS 3.0) performance measures in tobacco control used by the National Commission on Quality Assurance and the Joint Committee for Accreditation of Hospitals in the United States. Policy-makers need to consider as their first target obstetric and pediatric service populations. Ministries need to put in place agreed-upon organizational development strategies that will translate policy into practice, such as the following:

1. promote hospital-health care organization policies to support and provide smoking cessation services for pregnant women, parents and new mothers;
2. establish a policy in which all service sites and providers implement a tobacco user identification system at entry into maternal and pediatric care;
3. include smoking cessation treatment methods as part of the health benefit package; supply adequate provider compensation for the routine delivery of effective evidence-based smoking cessation treatment for pregnant smokers and new mothers/parents; and
4. provide the training resources and process evaluation feedback to promote routine use of effective, evidence-based methods by providers.

The Swedish Program for Pregnant Smokers: A Patient-Policy-Provider Partnership

In Sweden, the National Institute of Public Health, the Swedish Cancer Society, and the Swedish Heart and Lung Foundation have worked for almost 25 years to develop, integrate, and evaluate practical health education methods into prenatal care (66). The program devised by the National Institute of Public Health is an excellent example of the application of the partnership philosophy. The Institute's program had four objectives: 1) to provide prenatal care staff with health education methods to assist the pregnant smoker, 2) to train all prenatal care staff in specific methods, 3) to promote smoking as an important women's health issue within the media and 4) to promote wider-scale dissemination and use of vital statistics at the local and national level. Their national campaign also provided materials for staff and pregnant women, including a tailored training video. Newsletters were sent to midwives, and all training materials were provided to midwives for the training course. The Swedish program confirmed the importance of promoting cooperation between staff and

patients and the importance of working closely with staff to prepare written materials that can be used in routine clinical practice.

One of the most important lessons learned from these initiatives is the essential importance of having a public health policy and philosophy of integrating smoking cessation and pregnancy care methods into a comprehensive tobacco control system. Because a large percentage of women quit smoking on their own before becoming pregnant or quit prior to entry into prenatal care, the Swedish experience confirmed the importance of stressing, at a population level, quitting prior to entry into care. The ongoing work of the National Public Health Institute, directed by Dr Margaretha Haglund, was complemented by the excellent evaluation study conducted by Hjalmarson et al. (41).

Practitioner-Program Partnerships

The third foundation component of the partnership philosophy is the *practitioner.* Maternity and pediatric care/health care professionals and staff at community-based, school-based, and worksite-based programs who interact with women and parents of childbearing age need to strongly reinforce the clear message of the serious risks of smoking and provide routine advice to women to quit. Practitioners (e.g., obstetricians, family physicians, nurses/midwives, health educators and psychologists) need to examine existing patient education structure, process, and content. Training experiences are critical to changing clinical practice behaviors and procedures for women of childbearing age who smoke and pregnant smokers. A synopsis of the levels and types of training needed by health care professionals or tobacco control specialists for an entire system or agency is given in Table 7.

In each organization, especially health care provider organizations but also employers, schools and community-based programs, procedures discussed in this report must be incorporated into ongoing professional practice. The success of these strategies is dependent on a collaborative and participatory approach of policy-makers, practitioners, and parents. At present, considering the variation across the world of providers, a large percentage identify smoking as a risk factor and advise their patients to quit upon entry into prenatal care. Only through a more systematic approach at the policy and

TABLE 7. LEVELS AND TYPES OF CERTIFICATION FOR SMOKING CESSATION METHODS IN MATERNITY CARE PROGRAMS

LEVELS AND TYPES	COMPETENCY	TARGET AUDIENCE	ESTIMATED TRAINING TIME
LEVEL 1 Basic Skills Certificate	• Assess patient status • Deliver SCRIPT Model • Assist a patient to create a simple quit plan • Give simple counseling on the uses of the Guide • Arrange a referral to more intensive services	Trained-Licensed Professional who deliver cessation methods in the context of a routine maternity related services	Initial 3 HR–in-service Followup – 1-2 in-service
LEVEL 2 Cessation Specialist Program Manager	**Level 1 +** • Act as an instructor for basic skills certificate • Provide intensive tobacco cessation services within the structure of an existing program • Act as a technical resource for other health service professionals	Trained-Licensed Professional from health and human service fields including medicine, nursing, social work, behavioral health, public health education and psychology	5 days (40 HR)
LEVEL 3 Advanced Cessation Specialist Trainer Certificate Program Director	**Level 2+** • Act as an instructor for Cessation Specialist Certification • Develop-Manage-Evaluate cessation programs	Professionals from health and human service fields who dedicate significant time to cessation program direction	5 days plus (40 HR) supervised internship period

Sources: Richard Windsor, "The Handbook to Plan and Evaluate Smoking Cessation Programs for Pregnant Women," Second Edition, In Press, 2000.

practice level can we integrate these evidence-based, effective methods into routine care. The Swedish (66) and SCRIPT (11, 34, 39, 44, 46) models provide direct, empirical evidence derived from almost 20 years'experience in one country and in one US state (Alabama) that the partnership philosophy works.

Policy and Program Implications

Maternity care programs have a clear responsibility to provide efficient and effective means to help pregnant women quit smoking. Increased attention is also needed to assist maternal and child health programs plan, manage, and evaluate smoking cessation programs for pregnant smokers. Simple verbal statements to women about risks are ineffective. If an obstetric program expects to achieve a quit rate greater than 5–10 percent, modest increases in resources and training will have to be allocated. The typical informational content and methods of prenatal care education related to smoking need to be significantly revised to include specific smoking cessation and maintenance methods that have been established as effective.

The SCRIPT Model (34, 39) provides clear guidance about how to routinely provide "Best Practice" methods. Personnel costs associated with the provision of effective smoking cessation methods can be absorbed by most ongoing prenatal education programs with small allocations of personnel time. Training requirements for nurses/midwives in the use of self-help methods are also modest. This cost would be spread out over a year for counseling of all pregnant smokers.

It is appreciated that health care systems, regardless of the country, have to face challenges of time and cost. Nevertheless, because smoking during pregnancy and smoking in the presence of an infant has such serious, long-term risks, policy-makers, program administrators, and practitioners must accept the challenge and responsibility of integrating evidence-based methods into their systems of clinical practice. Making this commitment, individually and collectively, will improve health and prevent illness in millions of mothers and children of the next generation.

Recommendations for Research and Program Development

As individual national governmental and nongovernmental agencies review their 2010 national health objectives—specifically, their tobacco control program objectives—it is important that vulnerable groups, such as infants and mothers/parents, be given the highest priority. While it may be advantageous for a country to take a population approach to tobacco control, from the standpoint of efficiency and impact, it is prudent for each country to create a special program for pregnant women, women of childbearing age and their families.

One of the most important research needs in each country is to conduct a baseline survey to document rates of active and passive smoke exposure in a representative sample of pregnant women and new parents (68). Each country, with baseline data, should define its year 2005 and year 2010 national health objectives: 1) to routinely provide "Best Practice" methods and 2) to reduce active and passive exposure among pregnant women and infants (69).

From a population perspective, surveys need to be conducted among women of childbearing age to determine current perceptions of risks and self-efficacy in quitting. When resources are available, a variety of developmental and qualitative studies should be conducted to form foundational research and evaluation for the development of media-disseminated smoking cessation programs in every country, culture, and language. Because of the substantial level of passive smoke exposure in Asia and the increasing prevalence of smoking among young females of childbearing age, there are serious and urgent needs to conduct all of the noted studies in Asia.

The health education "Best Practice" method for pregnant smokers was derived from North American and European sites, with two studies from Australia. An immediate need is to tailor these methods by language and culture and train staff to provide them to pregnant smokers in other settings. Each country must document, from a qualitative and process evaluation perspective, which methods can be routinely provided to pregnant smokers and which method(s) their pregnant smokers find helpful for quitting. Wherever possible and wherever resources are available, it is strongly recommended that rigorous but practical evaluation studies be conducted. Multiple evaluation studies should be conducted, especially in Latin America, Africa and Asia.

The accomplishment of the above recommendations, singularly or in combination, would represent a substantial improvement in the public health practice base and scientific base of programs and policies for treating pregnant smokers in different countries and regions.

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Policies & Strategies

How to Make Policies More Gender Sensitive

Nicola Christofides

Women smokers are likely to increase as the percentage of the total. Women are adopting more dominant roles in society; they have increased spending power .... All in all that makes women a prime target .... Might we now expect to see a more defined attack on the important market segment represented by female smokers?
Tobacco Reporter, 1998 (1)

Two new Chinese cigarettes targeted at women smokers have carved a niche for themselves since they appeared in the shops. This is the first time that the Chinese tobacco industry has developed products with a particular group in mind.
World Tobacco, 1998 (2)

These quotations reveal that the tobacco industry is targeting women in not only the developed world but also the emerging markets of developing countries like China and South Africa. For example, in South Africa, cigarette brands have been developed to appeal to women, and there has been an increase in advertising that targets women (3). Unfortunately, for decades, national policies seldom countered such marketing strategies. This reflected a general bias in tobacco control programs in which women's concerns were often neglected.

However, since the 19th century there has been progress. The early tobacco control legislation in the 1800s included bans on the sale of cigarettes to minors to "protect the morals" of young people. For example, in 1890, a District of Columbia ordinance prohibited the sale of cigarettes to minors in the United States (4). In 1900, smoking by persons under 20 years of age was prohibited in Japan, and the sale of cigarettes to minors was also banned (5). Legislation enacted as a public health measure started in the 1960s, following convincing epidemiologic and other evidence that identified smoking as a cause of disease. Persuasive conclusions were reached in the 1962 report of the Royal College of Physicians (6) and the 1964 report of the US Surgeon General (7). Many studies (8, 9) showed that quitting reduced the risk of lung cancer and other diseases, thus reinforcing the benefits of comprehensive tobacco control measures as a means of reducing risks for tobacco-related diseases. Since then, tobacco control initiatives have emphasized preventive or cessation measures.

Still, until recently, tobacco control initiatives did not reflect the diversity of a population and did not specifically address women's concerns. The early epidemiologic research was carried out on men who were the majority of smokers at the time. Moreover, the devastating consequences of smoking were initially most prominent in men. Using men as the primary study group for general health problems meant that the opportunity was lost to determine if tobacco affects women's health in the same way. Even more significant, since research findings provided the impetus for tobacco control policies, policy makers did not consider the advantages of specifically addressing women's rates of smoking incidence and tobacco-related diseases. Fortunately, this approach has been increasingly challenged, and new directions are being sought.

This chapter examines critical points for advocacy and key questions that should be addressed if we are to prevent an increase in the prevalence of tobacco use among women. It examines a framework for understanding gender and policies as they relate to the tobacco control programs of four countries: China, Sweden, South Africa and the United Kingdom. These four countries were selected as exemplifying developed and developing countries at different stages of tobacco control programs, as well as smoking prevalence among women. Both South Africa and China represent expanding markets for the tobacco industry where women are specifically targeted. While the countries in no way represent the diversity of political, economic, and social contexts or of tobacco control policies, they do offer insights into how the content of tobacco policies can address both gender inequality and women as a group. From the outset, it is important to note considerable gaps in national data

concerning how tobacco control policies affect women. Nevertheless, current evidence points to interesting trends and advocacy issues for the future. Table 1 provides a picture of smoking prevalence in these countries.

TABLE 1. SMOKING PREVALENCE AMONG MEN AND WOMEN IN SWEDEN, SOUTH AFRICA, CHINA, AND THE UNITED KINGDOM (CURRENT SMOKERS)

COUNTRY	REFERENCE	MEN		WOMEN	
Sweden	10	17%	1998	22%	1998
South Africa	11	42% (1998)	1998	12%	1998
China	12	63% (1996)	1996	3.8%	1996
United Kingdom	10	29% (1996)	1996	28%	1996

DIFFERENT APPROACHES TO GENDER AND POLICY

The concept of gender has long been established as a major factor in women's health affecting the etiology, epidemiology, treatment, and eventual outcome of illness. It specifically refers to women's and men's roles and responsibilities that are socially determined (13). It is distinct from men's and women's biologic and reproductive characteristics, because it is shaped by historical, cultural, economic, and political constructs. By definition, gender constructs can, therefore, be changed and may permeate institutions, as well as influence individual actions. Although there is considerable controversy concerning its exact definition and applicability to health policy and issues of "equity" and "equality," there is little doubt that gender has influenced national policies on health (14).

What, then, is a gender-sensitive policy? While there are considerable in-depth analyses of gender and its relation to the political economy of health, much more research is needed to understand the way in which gender influences health outcome (14). For the four countries referred to in this chapter, a classification is applied to separate tobacco control policies by gender sensitivity. According to Kabeer (15), whose work has shaped much of the research and action on gender equality in the development field, the first step in analysis is to look at the different ways that gender is present or absent in policies. The term, "gender blind," describes policies that may appear neutral, like "smokers" or "young people," but are essentially male-biased and premised on men's needs and interests. Her framework identifies three approaches to having gender-sensitive policy, including gender-neutral, gender-specific and gender-redistributive policies (Figure 1).

Gender-neutral policy is based on having accurate information to accomplish a gender-based division of resources and responsibilities so that the aims of a policy are met. These policies attempt to target specific groups in order to achieve the objectives of the policy. Gender-neutral policies do not seek to challenge gender inequality.

If Kabeer's framework is applied to tobacco control policies, gender-neutral policies would be based in and responsive to disaggregated information on tobacco use. The necessary data would not only address women's and men's tobacco consumption separately, but they would also be broken down by age and would track trends in consumption over time. It would reflect the different socioeconomic factors that contribute to girls' and women's beginning to smoke and those factors that make it difficult for women to stop smoking. Factors associated with starting to smoke might include a desire for gender equality, reinforced by the tobacco industry through advertising and sponsorship. Factors possibly contributing to women's continuing to smoke include less access to information and cessation programs. A gender-neutral policy would then allocate resources to meet specific goals, such as the reduction of the number of girls who start smoking or of the number of women who stop smoking. Legislation, which might be viewed as gender neutral, includes the banning of tobacco advertising and control of environmental tobacco smoke through regulating smoking in public places and workplaces. Taxation of tobacco products may also be viewed as a gender-neutral policy.

Gender-specific policies acknowledge that women's gender-related needs have been neglected in the past and advocate specifically on behalf of women. Such policies favor activities that benefit women. A gender-specific smoking prevention policy, for example, would identify specific strategies that are appropriate for women. These strategies would be based on research into the factors that influence girls to smoke. Gender-specific tobacco control policies would recognize that women have been neglected through a lack of recognition of the different socioeconomic and cultural factors that contribute to tobacco use among women as compared with men. Specific programs would be implemented that would address the needs and interests of women, while continuing to address the needs of men and possibly targeting men. For example, health worker interventions have proven effective in influencing clients to stop smoking. Many tobacco control policies improve health worker awareness of the importance of reaching pregnant women because smoking damages the health of the

fetus. However, health workers also need to be aware of the various motivations of men and women at different stages of the life cycle with regard to smoking in order to have a maximum impact on both sexes.

Gender-redistributive policies recognize that women are often excluded or disadvantaged with regard to social and economic resources and decision-making. These policies are based on the identification of imbalances of this kind, and they allocate resources to redress inequities. For this reason, they may redistribute resources and power from men to favor women. For example, women who have received training in gender issues may be placed in leadership positions in tobacco control.

Gender-redistributive policies address two different dimensions. The first is allocation of funds specifically to redress imbalances in past policies. Thus, if past policies focused on persuading men who smoke about the dangers of smoking and the value of quitting, a policy intended to reduce the imbalance in priority given to women's health might focus specifically on targeting women who do not smoke. A gender-redistributive policy might target only women, if resources are limited in policy-making itself.

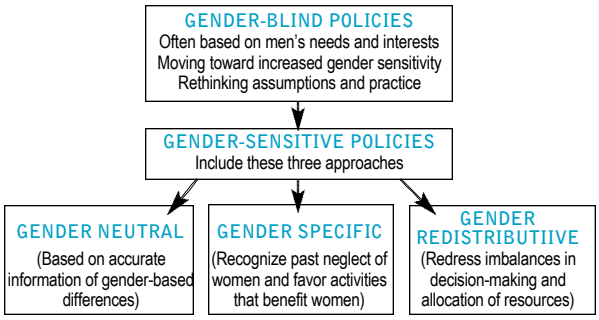
Second, gender-redistributive policies might address the representation and participation of women in policy-making. Such policies would ensure greater participation of women in decision-making, thus redressing imbalances at that level. For example, a gender-redistributive policy would ensure that women have leadership positions in tobacco control programs or that projects focusing on tobacco have input by the target community's women, as well as its men, at the stage of problem definition and program design.

ROLE OF POLICY PROCESS IN INFLUENCING THE APPROACH TO GENDER ISSUES

In analysis of policy, consideration should be given to the process that led to its development, because this is a dynamic process and not just the production of a policy statement (16). The following are key potential determinants of policy development:

- the social, economic and political context (21), including the status and social value of women in society;
- the range, position, power and influence of the involved parties (18), including policy makers (politicians and bureaucrats), policy influencers (groups inside or outside government) (16), the public and the media, and including the participation of lobby groups, politicians and others concerned with women's rights or health;
- the interests of those wishing to influence policy development (the tobacco industry vs. anti-tobacco non-governmental organizations), including women's groups that would promote the interests of women; and
- the capacity of those wishing to influence policy (16, 19, 20), including grassroots women's groups that might not have training in advocacy skills to enable them to lobby policy makers.

FIGURE 1: KABEER'S FRAMEWORK FOR GENDER-SENSITIVE POLICIES



The policy analysis should consider problem identification, policy development and political forces and factors (21). For example, the risk of lung cancer for women has increased over recent decades. In the United States, women's consumption of tobacco peaked in the late 1960s, and the incidence of lung cancer exceeded all other cancers in the 1980s. In the United States, the female lung cancer age-standardized death rates from 1982 to 1986 were 130.4 per 100,000 (22). In 1980, the US Surgeon General's report, *The Health Consequences of Smoking for Women*, acknowledged the impact of smoking on women's health (23). The increasing incidence of lung cancer and other tobacco-related diseases contributed to the development of specific interventions that focused on women.

The various parties who influence decision-making define the context in which policies come about. The public, for example, may not influence the development of policy but may create a social climate for policy-making (16). For example, if the public resists the implementation of restrictions on smoking in public places, the pace of policy implementation may be slowed. The consequences might further depend on the interplay among the policy, the public's response, politicians, and policy implementers to build opportunities to gauge public perspectives.

Governmental participants may come from different departments such as health, finance, agriculture and labor or from nongovernmental organizations, which could include anti-tobacco organizations, health-based groups and professional groups like teachers and women's groups. The participants and the interactions among them will influence the approach to gender in policy implementation.

In the four example countries, political support started with a Minister of Health who was in favor of tobacco control legislation. The Minister had to be able to convince the government as a whole to take action (24). For example, Dr. Zuma, the Health Minister in South Africa, played a pivotal role in pressing for advertising bans and smoke-free public places and workplaces. Advocacy by anti-tobacco and health groups is also important. In South Africa, nongovernmental organizations, like the National Council against Smoking, supported the minister in her efforts. Collaboration between governmental and nongovernmental sectors, which allows for the sharing of knowledge and ideas, leads to a more comprehensive approach.

The process of policy development differs among countries, reflecting different cultures and the forms and styles of the organization of civil society. In China, for example, epidemiologists and governmental health institutions provided the critical input. In Sweden, most of the impetus came from the National Institute of Public Health, supported by such nongovernmental organizations as Nurses against Tobacco. The implementation process is also relevant to gender sensitivity as it shapes policy. Even policies not directly addressing gender issues may become gender sensitive or gender redistributive with implementation.

OVERVIEW OF THE TOBACCO CONTROL POLICIES FROM THE FOUR COUNTRIES

In all four example countries, tobacco control policies include some form of advertising restrictions and health promotion. Sweden's policy is extensive, having been developed over several decades. The policy is gender neutral, recognizing disaggregated information on smoking prevalence. In Sweden, some policies, such as those directed at health promotion, have been implemented in a gender-specific way. Pregnant women have been identified as a focus, as have young women (25). Other aspects of Sweden's policy that affect women are smoke-free public places, taxation of tobacco products and extensive health promotion, which includes the intersectoral training of health workers and teachers (26). A new policy paper, likely to be adopted in the year 2000, is gender-specific in that it identifies the need to address women comprehensively (27).

The United Kingdom's white paper identifies pregnant women as a target group. It emphasizes the training of health workers to counsel smokers to quit and to make nicotine replacement therapy available.

The United Kingdom's tobacco control policies, until last year, were piecemeal, based on voluntary agreements with the tobacco industry. Some legislation has been passed, such as the banning of cigarettes on television in 1964 and extended to radio in 1973, but few other legislative measures had been taken. Instead, voluntary agreements with the tobacco industry were made, including the introduction of health warnings on cigarette packs (28). A new comprehensive white paper on tobacco control was launched in 1998. It is gender-neutral in that it recognizes disaggregated information. The white paper recognizes the link between smoking and health inequality. The inadequacies of current programs in reaching the least advantaged groups are addressed. Scotland has gender-specific programs, such as the Women, Low Income, and Smoking Project (29). The 1998 policy includes advertising bans that will be phased in through the year 2006. There is also a focus on mass media campaigns and young people are also a clear priority with the enforcement of underage sales legislation. The United Kingdom's white paper identifies pregnant women as a target group. It emphasizes the training of health workers to counsel smokers to quit and to make nicotine replacement therapy available. However, restrictions on smoking in public places are weak, as the policy places emphasis on the individual's right to smoke. Like Sweden's policy, the United Kingdom's white paper supports the Framework Convention on Tobacco Control and recognizes the need for global tobacco control.

South Africa's policy aims to reduce the pressure on young people to start smoking and to protect the rights of nonsmokers to a smoke-free environment (31). Legislation passed in 1993 restricted the sale of tobacco products to young people and their access to vending machines. Extensive rotational health warnings had to appear on tobacco products and tobacco advertisements.

New legislation, passed in April 1999, included advertising bans and restrictions on smoking in public places and workplaces. Advertising bans were motivated by the need to keep women and youth from starting to smoke, since the marketing of tobacco products is increasingly being directed toward these groups (30). A mass media campaign was run between 1994 and 1997 that aimed to reach the largest number of people without specific target groups. An education program is planned that will be implemented together with restrictions on smoking in the workplace. The taxation of tobacco products, increasing the real price (after inflation) of cigarettes, has been implemented since 1992. Most of South Africa's policies are gender-blind, because they are not based on information about the different socioeconomic factors that influence men and women to start smoking or that might impact on cessation. The recent advertising ban is an exception to this, as it is a gender-neutral policy that was developed partly because of the increased marketing by the tobacco industry to women.

China's policy includes advertising restrictions and the banning of smoking in some public places in 70 cities. Health education is a component of the policy (12). One of the recommendations that emerged from the 1996 prevalence survey of smoking, carried out in conjunction with the Ministry of Health, was the need to maintain low smoking rates among women through an aggressive campaign to counter the targeting of women in China by the tobacco industry. There is also recognition of the risk of exposure to environmental tobacco smoke for nonsmokers (mainly women and children), and education campaigns to increase awareness are planned (12). Although policies introduced in the early 1990s were gender blind, tobacco control policy that emerges in China in the future is likely to be gender sensitive, reflecting the substantial differences in smoking prevalence between women and men.

The policies of China and South Africa give greater emphasis to punitive rather than to educational policies, perhaps because of funding limitations. It is less costly to implement policies such as advertising restrictions and limiting smoking in public places rather than active policies such as extensive health promotion. This would require reorienting health services and education that target specific groups, such as women.

MARKETING AND PROMOTION

What is the state of legislation against advertising in Sweden, China, South Africa and the United Kingdom, and does it recognize the tobacco industry's focus on bringing women into the market?

In Sweden, the first restrictions on tobacco advertising were introduced in the 1960s. These included the restriction of tobacco advertising in theaters and the cinema, sports arenas, and sports events and on sports pages in magazines and newspapers. In the 1970s, tobacco companies were not allowed to use human models in their advertisements. By the end of that decade, health warnings became mandatory on advertising for tobacco products, and advertising for tobacco products was banned on television and radio. Since 1994, tobacco advertising has been almost totally banned. However, point-of-sale advertising and indirect advertising through same-name marketing of products, such as Marlboro clothing or Camel boots, are allowed.

In China, advertising on television and radio and in newspapers and magazines was banned in 1992. However, the loopholes in the Chinese restrictions have allowed tobacco companies to shift where and how they advertise. This has led to an increase in billboard advertisements, infomercials on television, and the sponsorship of sports, art and music events.

In South Africa, the advertising of cigarettes on television has never been permitted. However, industry-sponsored sports and music events, like Rothman's soccer, continue to be televised. In 1993, tobacco control legislation was introduced that made warnings on tobacco advertising mandatory. In the implementation of this legislation, radio advertisements were excluded from carrying warnings for a period of time in exchange for free airtime for anti-tobacco messages. This allowed for airtime worth 50 million rand (US$ 8.2 million) (3). An amendment to the tobacco control legislation was passed in 1999 that prohibits all advertising, including indirect advertising and promotional events. However, this has yet to be implemented.

In the United Kingdom, advertising and sponsorship bans will be phased in between 1998 and 2006. The ban includes billboard and press advertising and will extend to the sponsorship of sports.

A total ban on the advertising of and sponsorship by tobacco companies reduces smoking among most groups as a broad measure. It is clear from tobacco industry documents that women are being specifically targeted. A complete ban on advertising and promotion across all tobacco products and in all media is therefore recommended as an integral part of a comprehensive, gender-sensitive tobacco control policy.

PRICE ELASTICITY: Why Might Increased Taxation Impact Women?

Studies have shown that tobacco consumption declines when tobacco prices increase through taxation. Young people are particularly sensitive to price increases. Therefore, there is some indication that girls and women with low socioeconomic status might be sensitive to price increases. Taxation should be considered as a strategy in gender-sensitive tobacco control policy.

Taxation is related to the issue of price elasticity, a measure of the response to a change in price. Therefore, if the price of tobacco increases, price elasticity measures whether there is a compensatory decrease in tobacco consumption. One of the clearest and most immediate influences on tobacco use is its price. Tobacco control policies that include taxation of tobacco products therefore reduce tobacco consumption. Price elasticity is higher in developing countries than in developed countries (31).

In the United States and the United Kingdom, studies have examined price elasticity for different groups. The effects of price on tobacco consumption vary according to age and socioeconomic status. Studies conducted in the United States found that youth were consistently more sensitive to price increases (32, 33). Other data indicate conflicting conclusions. For example, a study carried out in the United Kingdom indicated that women with lower socioeconomic status and teenage girls were significantly affected by price increases (34). Women who were unskilled workers or married to unskilled workers showed the greatest response (34).

Gender inequality manifests itself in access to income, particularly in developing countries. Women often have less disposable income than do men and less control over income within households. When women do have some disposable income, they are more inclined to spend money on their children than on themselves (35). This could imply that, in developing countries, women might be more affected by price increases because of lower income. However, more research on this issue and the impact of this strategy in developing countries is needed.

The tobacco control policies of Sweden, the United Kingdom, and South Africa include the taxation of cigarettes. Sweden increased taxes several times during the 1990s, and consumption decreased with increased taxes. Taxation, however, was reduced in 1998 because of an increase in smuggling. In South Africa and the United Kingdom, consumption decreased with an increase in taxation that raised the real price of cigarettes (36). However, differences in responses between men and women and different age groups were not studied. This policy has been implemented in these countries and its impact has been evaluated. These evaluations have shown that, when the price of cigarettes is increased through taxation, tobacco use declines (36). An oversight in the taxation policy in South Africa is the exclusion of snuff, used mainly by rural women, from taxation.

WOMEN AS PASSIVE SMOKERS: What impact do smoke-free public places and workplaces have on women?

Women who are nonsmokers are more likely to be exposed to environmental tobacco smoke or passive smoke in countries where smoking rates are high among men. This issue is described in the chapter *Passive Smoking, Women and Children* by Jonathan Samet and Gonghuan Yang. However, restrictions on smoking in public places and workplaces are insufficient in many countries, particularly those in sub-Saharan Africa, because many women do not work outside the home. Education aimed at male smokers is required to increase awareness of the risks passive smoke poses to their families.

In countries where smoking rates are high among men and low among women, such as in Asia and Africa, nonsmoking women are more likely to be exposed to passive smoke than are men and to be at an increased risk for a number of diseases.

Sweden has implemented extensive restrictions on smoking in public places and workplaces, and South Africa has similar policies. More than 70 cities in China have introduced legislation that bans smoking in certain places, such as theaters, video halls, music venues, indoor sports stadia, reading rooms and exhibition halls, shopping malls, waiting rooms, public transport, schools and nurseries. There is also provision for municipalities to introduce further restrictions. The United Kingdom, by contrast, has a point of departure in its policy where smokers have a right to choose; therefore, there are limited restrictions on smoking in public places.

While these regulations do not affect the exposure of women to environmental tobacco smoke in their homes, they do reduce the overall exposure. There is indication that the amount of exposure increases the risk of developing a tobacco-related illness. The number of hours in

a day that someone is exposed to environmental tobacco smoke is therefore important. Restrictions on smoking in public places and workplaces can also create a social climate where it is not acceptable to smoke indoors. This can empower nonsmoking women to limit smoking in their homes.

PROGRAMS FOR PREGNANT WOMEN
Are they gender sensitive?

The policies of both the United Kingdom and Sweden identify pregnant women as a specific target group for the reduction of tobacco use. Most women-specific prevention and cessation programs in these countries focus on smoking during pregnancy, often the only issue that differentiates between male and female smokers in tobacco control policies (37). Some women's groups have raised objections to this approach, noting that, too often, the motivation for specifically targeting pregnant women has not been the reduction of smoking among women but rather the protection of the fetus. Women are thus considered only in their procreative role. As a result, programs that aim to reduce smoking by pregnant women have sometimes been labeled as "victim blaming" and accused of using guilt to encourage women to stop smoking.

It is evident that these programs are effective in reducing the number of women who smoke during pregnancy. In Sweden, for example, in 1997 only 15 percent of women continued to smoke during pregnancy (26). The relapse rate, though, is high with between 50 percent and 60 percent smoking again within 6 months after the birth. As a result of these findings, Sweden will integrate programs that are aimed at pregnant women into a comprehensive, gender-sensitive tobacco control program. The focus would then shift from victim blaming to viewing pregnancy as an opportunity for women to stop smoking for their own sakes (37). The United Kingdom white paper also recognizes the need to provide support to prevent relapse after the baby is born; however, the baby's health will still be the focus through increasing women's awareness of passing nicotine to the baby through breast milk and the risk of sudden infant death syndrome (SIDS) (29).

The reduction of the number of women who smoke during pregnancy is an important public health intervention. However, this should be part of comprehensive, gender-sensitive programs that focus on women throughout their life cycle. Pregnancy is a good entry point for reaching women and their partners who smoke, but support in maintaining nonsmoking after birth should be an integral part of programs. Moreover, additional strategies must be developed to target young women and non-pregnant women.

HEALTH WARNINGS

Mandatory health warnings on cigarette packages are a form of health information to alert the public to the dangers of smoking and the use of tobacco. Sweden and South Africa have strong rotational warnings. The United Kingdom, too, has health warnings on cigarette packs.

Examples of warnings in South Africa include "Smoking causes lung cancer" and "Smoking is addictive." Most health warnings match the lack of gender specificity described thus far. They are aimed at the broadest group. However, there are warnings that target pregnant women, such as "Pregnant? Breastfeeding? Your smoking can harm your baby." These reflect the value society places on women as caregivers, responsible for the health of their families. Symbols of fatherhood are notably absent despite growing evidence that the babies born to nonsmoking women whose partners smoke while they are pregnant can have lower birth weights. Where women's smoking levels are low, as is the case in South Africa, a message such as "Smoking can make your wife sick" would help to promote men's awareness and responsibility.

HEALTH EDUCATION AND PROMOTION:
An opportunity for gender-specific strategies

"Health promotion is the process of enabling people to increase control over, and to improve, their health" (38). Increased control over health is achieved through enabling an individual or group to identify and satisfy aspirations and needs and to change or cope with the environment in order to reach a state of complete mental, physical, and social well-being (38). Policies in all four countries include health promotion. These can be loosely divided into prevention and cessation strategies. In Sweden and the United Kingdom, health promotion policy is gender sensitive.

In Sweden, for example, specific activities have focused on women. There is a broad range of strategies including the training of key professionals, such as health workers, school nurses, staff at youth clinics and teachers, with regard to specific issues relevant to girls and women. In antenatal clinics, 80 percent of the staff have been trained in how to initiate discussions on the prevention and cessation of smoking. Guidelines have been developed for different groups of professionals, such as school nurses and staff at youth centers. Self-help man-

uals have been developed for different target groups such as pregnant women, parents, young girls and older women. Booklets on how to give up smoking without putting on weight have been developed. Supplements to magazines for young women have also been developed and distributed. Role models for young women have been identified, including fashion models, television stars and pop stars. The media have also been used with projects like "smoke-free Miss Sweden." Since 1996, all candidates for Miss Sweden must be nonsmokers. These candidates also tour local schools with antismoking messages. The candidates for the competition receive a week's training about how to convey messages to children and about participatory strategies, different tobacco control strategies and tobacco industry tactics (25).

In the United Kingdom before the launch of the white paper last year, the government allocated resources to various health education agencies for campaigns. These campaigns were aimed at informing the public about the health risks of smoking (28). Health promotion activities outlined in the new white paper are extensive and include mass media and education campaigns. The latter will include the training of health workers and teachers through initiatives like the "Healthy Schools Campaign." The National Health System will provide cessation programs that will be focused on the most deprived areas and will aim to reach the least advantaged groups. Women will be the focus of gender-specific programs like the "Women, Low Income, and Smoking Project." The Minister of Women has identified the need to reduce smoking among teenage girls (29). The white paper was launched in 1998 and, as a result, the implementation and evaluation of these policies have yet to be carried out.

In South Africa, mass media campaigns have been used. There are plans to develop and implement workplace education packages and school-based programs. Thus far, it seems that neither of these initiatives is likely to be gender sensitive. Nongovernmental organizations may take up more targeted initiatives. The National Council against Smoking runs a tobacco or health information line. Soul City, for example, has included tobacco as a focus in its mass media approach to addressing health issues. The Women's Health Project is coordinating a multi-country research and advocacy initiative that aims to gather information on factors influencing tobacco uptake among women in order to provide evidence for use in advocating for gender-specific health promotion initiatives.

An opportunity for prevention could be lost because of a lack of gender-sensitive prevention programs. Since smoking rates are low among women in South Africa, programs could be aimed at reinforcing women's healthier lifestyles and dissociating tobacco use from equality. Since materials have not yet been developed, nongovernmental organizations in this field may influence their content to address women and gender equality directly.

In Sweden there are specific activities that have focused on women. Role models for young women have been identified, including fashion models, television stars and pop stars.

In China, health information campaigns on tobacco were initiated in the early 1980s. The first "No-Smoking Day" was held in Shanghai in 1987. Since 1988, the World Health Organization's No-Tobacco Day has been celebrated annually. The policy and current health promotion activities do not acknowledge or address gender differences in smoking.

Health education is a key area for the implementation of gender-sensitive policy. While a general policy can contribute to preventing women's uptake of smoking, gender-specific approaches are needed for health education and promotion. Research is needed on the gender-based differences in smoking uptake and the factors that influence men and women to stop smoking, including any differences in responses to addiction. Monitoring must be carried out to determine how effective mass media campaigns are at reaching disadvantaged groups.

Training of different sectors is important in the implementation of gender-specific health promotion. Coverage should include health workers, teachers, youth leaders, and women's nongovernmental organizations. Tobacco control needs to be addressed by a number of different governmental departments, including health, education, agriculture, labor and women's affairs. International advocacy for increased gender sensitivity in tobacco control policies needs to be taken up at an international level through, for example, the monitoring of the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the Framework Convention on Tobacco Control (FCTC).

BARRIERS TO THE IMPLEMENTATION OF POLICY

A review of the global development of tobacco control legislation and policy indicates a general failure to control tobacco use in some of the world's poorest nations, particularly in sub-Saharan Africa (39). In some cases, such as in Malawi and Zimbabwe, a tension exists between economic interests and public health. Poor countries also often have limited resources for research and political action so that developing countries lag behind industrialized nations in the formulation and implementation of tobacco control policy.

Lack of funding appears to be another barrier to the implementation of tobacco control policy and, especially, gender-specific policy. This is particularly relevant in developing countries. For example, South Africa's budget for tobacco control for 1999 was 1 million rand (approximately US$145,000) for a population of about 40 million. By contrast, the United Kingdom, with a population of about 59 million people, earmarked over 100 million pounds (US$150 million) for the implementation of their tobacco control strategy from 1998 to 2001. In the face of limited resources, priorities have to be set, and targeted strategies that adequately reflect population heterogeneity may not be possible. As a result, gender-specific policies may not be set. For example, in the South African case, a blanket approach has been taken, and initiatives are designed to reach the broadest audience rather than focusing on the needs of specific groups.

Barriers to implementation may also detract from any tobacco control program, no matter how well conceived. Lack of funding, which was discussed earlier, is a barrier to the implementation of gender-sensitive policy. Inadequate funding requires the initiation of programs with the broadest reach rather than targeting specific groups. Thus, the opportunity for prevention of a tobacco epidemic among groups with low rates of tobacco use, such as women, may be lost.

Enforcement of legislation is another barrier to the successful implementation of tobacco control policy. Enforcement requires funding, as well as a good management system. Ensuring, for example, that workplaces are smoke-free requires monitoring. Implementation of smoke-free public places and workplaces should include education of employees and the public of their rights in order to increase compliance by employers.

Time is needed to implement policies, especially when there is strong opposition. The tobacco industry actively opposes tobacco control attempts through different partners, including the hospitality industry, the agricultural sector, the advertising industry, labor and the media (40). These industries have large budgets and can influence the social and political climate into which policies are introduced. The limited tobacco control funding makes it difficult to counteract these powerful players.

Political will is an essential component if tobacco control policies are to be effectively implemented. There needs to be support and expertise within governmental departments together with effective advocacy from nongovernmental organizations. If any one of these factors is absent, the effective implementation of gender-sensitive tobacco control policies will be impeded.

MONITORING AND EVALUATING: An integral part of effective policy

Monitoring prevalence rates and trends, socioeconomic factors that contribute to tobacco use, the health impact of tobacco, and the economic cost of tobacco use is important for developing and supporting tobacco control policy. It is also necessary for countries to monitor the implementation of legislation and to assess the impact of different tobacco control policies.

In Sweden, disaggregated smoking prevalence data have been obtained annually. A study on the implementation of restrictions of sale to minors was carried out in 1997. A baseline survey was carried out before the implementation, and follow-up studies have been carried out since. There has been an evaluation of the impact of tax increases on consumption. An evaluation of the smoke-free childhood program has been carried out, as well as a media study looking at the impact of the smoke-free Miss Sweden. Other studies have looked at economic aspects and the effect of banning smoking in the workplace (27). Sweden offers an example of thorough, ongoing policy evaluation.

Disaggregated prevalence data have also been gathered in the United Kingdom for all age groups. Indicators for assessing the impact of the new white paper have been developed. These include reducing the number of children who smoke from 13 percent to 9 percent, adults from 28 percent to 24 percent, and pregnant women from 23 percent to 15 percent by 2010 (29). The evaluation of health promotion programs is also planned.

There have been three national prevalence surveys on tobacco use in China. Comprehensive reports were published on each, and data have been published on the economic impact of tobacco on China. However, there was a 12-year gap between the two recent studies, carried out in 1984 and then in 1996. This makes it difficult to determine trends of the age groups where tobacco use is increasing and limits the opportunities to take preventive action. The recommendations that have emanated from the recent prevalence survey indicate that the need for preventative action to maintain low levels of smoking among women has been identified and action is recommended. This reinforces the need for regular, comprehensive monitoring of trends in tobacco use. The socioeconomic factors that contribute to women's starting to smoke also need to be evaluated. Gender-specific policy cannot be developed without this insight.

It should be noted, though, that data alone are not always sufficient for the development and implementation of gender-sensitive policy. Political will is an important component in the development of policy. The United Kingdom demonstrated this through piecemeal tobacco control policy during the years of Conservative Party government in the 1980s despite ample evidence regarding smoking prevalence and its impact on health. The tobacco industry appeared to have considerable power and influence with decision-makers during this era. Conflict existed in government between health interests and the broader economic interests. This example demonstrates the importance of recognizing the impact of the political context and the power of influential actors in shaping the development of policy or indeed the failure to develop policy.

CONCLUSION

The challenges facing countries that have limited tobacco control policy and resources for research and lobbying are enormous. As tobacco consumption decreases in industrialized nations, the tobacco industry seeks other markets. These are often countries that have not developed comprehensive tobacco control programs. Perhaps some of the insights gained in countries that have adopted tobacco control policies can inform the process in other countries and situations.

The countries examined in this paper do not fully represent the diversity of political, economic, and social contexts or of tobacco control policies. However, they do offer an opportunity to gain insight into how the content of tobacco policies can ignore or address both gender inequality and women as a group. It is also evident that these countries have achieved varying degrees of gender sensitivity. According to Kabeer's framework for gender-sensitive policies, all four countries have some gender-neutral policies because the policies are based on information on the gender-based division of resources and responsibilities. Examples of these include advertising restrictions and smoke-free public places and workplaces. It should be noted that some policies could only be gender neutral since it would be inappropriate, for example, to introduce a policy that bans advertisements targeting only women and girls. A total ban of advertising and sponsorship is recommended.

The greatest need for the development of gender-specific policies is in health promotion and education. Sweden and the United Kingdom provide examples of effective initiatives. Gender-specific policies should be based on a clear understanding of the socioeconomic factors that contribute to girls'starting to smoke as well as the factors that maintain smoking. A variety of strategies are required for greatest effectiveness. These can include the integration of gender concerns into the Framework Convention on Tobacco Control (41), mass media campaigns, the intersectoral training of different groups ranging from health professionals to youth leaders, and obtaining media support through advocacy. These strategies can contribute to the creation of a supportive environment.

The opportunity for countries to introduce gender-redistributive policies is vast. Sweden has had women in key leadership positions, which has impacted positively on the implementation of policies with greater gender sensitivity. However, this has not been as a result of a conscious decision to transform tobacco control through redistributive policies. Gender-redistributive policies consciously recognize that women are generally excluded or disadvantaged in relation to social and economic resources and decision-making. Redistributive policies are based on the identification of imbalances of this kind, and they allocate resources to redress this inequity. The Framework Convention on Tobacco Control could be influential if the objectives include recognition of the principles of redistributive policy through strengthening women's role within tobacco control leadership and through the allocation of resources to fulfill this objective.

In order to prevent an increase in smoking among women, a comprehensive strategy must be developed. Focusing on one or two measures only is unlikely to have a sustainable impact on the uptake and cessation

of tobacco use. Strategies such as a complete advertising ban, taxation, and smoke-free public places and workplaces can create an enabling environment. These need to be combined with extensive education programs and the training of different sectors, including the health sector.

Women's groups must become more prominent in calling for governments to develop and implement tobacco control policies. In order to do this, awareness should be raised within these organizations about the health consequences to women who use tobacco. This would require capacity building and resources.

The Framework Convention on Tobacco Control is an international legal instrument that aims to control the global expansion of tobacco. It can help mobilize national and global technical and financial support for tobacco control. The objectives of the Framework Convention on Tobacco Control can be gender sensitive and could include the strengthening of women's leadership role in tobacco control. Protocols, which are a form of treaty, that supplement, clarify or qualify the Convention can be developed to focus on gender issues. The WHO Tobacco-Free Initiative is working toward strengthening the role of women in global tobacco control, and links with the Convention on the Elimination of All Forms of Discrimination against Women should be considered.

Finally, there is a need for policy research related to the development and implementation of tobacco control policies that affect women. In determining priorities, researchers should work together with policy makers and policy advocates. Resources should support researchers, including women researchers, in developing countries to conduct policy research on tobacco. This would ensure that policy-oriented research would also benefit the majority of the world's women.

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Economic Policies, Taxation and Fiscal Measures

Rowena Jacobs

The economic aspects of tobacco control are critical to any program directed at women. Using economic policies requires scientific rigor and the harnessing of economic tools in gender-specific analyses. This chapter addresses the rapidly expanding body of research on the economic effects of tobacco control policies, particularly on the economic forces influencing tobacco consumption. Tobacco plays an important role in some countries'employment, tax revenues and trade balances. Governments have a legitimate concern that tobacco control policies will have an impact on these industries. Thus, economic analyses surrounding these supply-side arguments have been of growing interest, particularly in countries that are large producers of tobacco. The importance of this debate in tobacco control policy will be briefly touched on in this chapter.

Economists typically examine two sides of the same coin with regard to tobacco control policies (1). The "demand" side, which focuses on factors that affect the demand for tobacco, has been far more prevalent in the literature. The "supply" side focuses on the production and supply of tobacco, although the two are inextricably linked via various market forces. Most economic analysis has examined the relationship between taxation, price, consumption and disease outcomes on the demand side and the relationship between taxation, consumption, jobs and smuggling on the supply side.

Debates around the economics of tobacco control on the demand side have focused on various issues, among which are equity and efficiency concerns about cigarette taxation, the social costs and benefits of tobacco, and economic theory regarding increased taxation and whether tobacco taxes are regressive or not. Advertising and counter-advertising, the dissemination of public health information and the adoption of laws that restrict smoking in certain places and restrict access to tobacco are all topics that have formed portions of econometric analyses; and though these analyses have limitations, they have added insights into the role of these public policy measures in restricting tobacco use. These issues are all relevant to understanding economic aspects of policies related to women and will be discussed in this chapter.

It is noteworthy that very little economic policy research has been devoted specifically to women. The extent of knowledge regarding how young people respond to tobacco control policies is somewhat stronger. Nevertheless, where possible, this chapter will highlight research findings pertaining particularly to women and youth.

DEMAND-SIDE POLICY RESPONSES

A variety of factors can affect the demand for cigarettes and other tobacco products, including price, income, advertising, promotional activities, tastes, education, consumers'knowledge of the hazards of smoking and parental and peer smoking behavior. However, most economic studies have focused on the affordability aspect, or price, as taxation reflects the tractable policy variable that can influence demand. These other variables, however, are just as important, because they help to explain why large variations in price across countries are often not associated with comparably large variations in smoking prevalence (2). Although many of these aspects of demand have not been examined for women in particular, the findings pertaining to women and children will be highlighted here, and this paper will discuss how the broader policy responses may pertain to these groups in trying to curb tobacco use.

Pricing

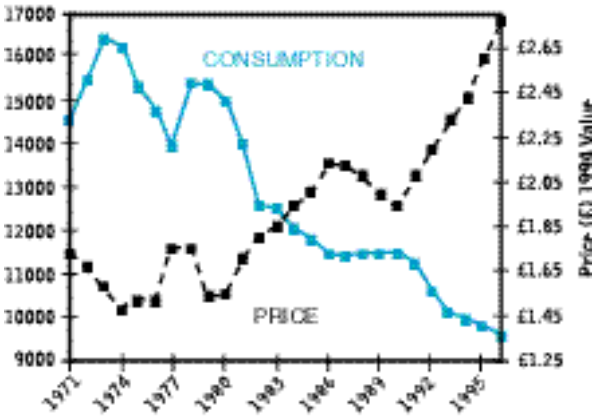
Elasticity is the economic measure of the response to a change in an economic variable such as price or income. In the context of smoking, it is defined as the percentage change in the dependent variable (smoking prevalence or number of cigarettes smoked

per day) brought about by a 1 percent change in the inflation-adjusted price of cigarettes (independent variable). Smokers can respond to price increases by either stopping smoking or smoking less. Therefore, prevalence price elasticity is the percentage reduction in the prevalence of smoking that would be predicted from a 1 percent price increase. Consumption price elasticity would be the percentage reduction in the average number of cigarettes smoked by persons who continue to smoke after a 1 percent price increase. Total (overall) price elasticity is the sum of smoking prevalence and cigarette consumption price elasticities (3).

Studies examining price elasticity therefore use demand as the dependent variable (usually measured as per capita cigarette consumption) and have a range of independent variables which usually include price and income and can also include a host of other variables that can control for other influences on demand (such as tobacco advertising expenditures, anti-tobacco advertising, legal restrictions, access, tastes, demographic variables, past (lagged) consumption and so on). When the independent variables are regressed against the dependent variable, the coefficient on the price variable is used to establish the price elasticity estimate.

Early estimates for price elasticity of demand had a relatively broad range, between 0.14 and 1.23, although some of these studies had difficulties with econometric modeling (notably relating to multicollinearity) (2). State-of-the-art methods addressing these difficulties have produced estimates for developed countries that now fall within a narrow range centered around 0.4. For developing countries, the average price elasticity is around 0.8. It should be noted that the estimate of price elasticity for developed countries is based on a large number of studies, while that for developing countries is based on relatively few. However, the negative coefficients do suggest that for countries of all income levels, price increases on cigarettes are effective in reducing demand. This is because, on average, for a price rise of 10 percent on a pack of cigarettes, demand would be expected to fall by around 4 percent in high income countries and by about 8 percent in low- and middle-income countries (1). Therefore, higher prices resulting from higher taxes would lead to significant reductions in tobacco use and smoking. This negative relationship between price and quantity underscores the most fundamental principle of economics, that of the downward sloping demand curve, which states that as the price of a product rises, the quantity of that product demanded falls. This responsiveness is therefore even stronger in developing countries, given lower incomes. As will be shown in this paper, children and adolescents are more responsive to price rises than adults, since they have less disposable or discretionary income. Therefore, tax increases that lead to real price increases are an extremely potent weapon for curbing demand. There is also evidence that price elasticity is higher in the long run than in the short run, given sustained real price increases, which means that, over time, tax increases that lead to price increases can have even more substantial effects than implied by the short run price elasticity estimate.

FIGURE 1: REAL CIGARETTE PRICES AND REAL CIGARETTE CONSUMPTION, UNITED KINGDOM, 1971-1996



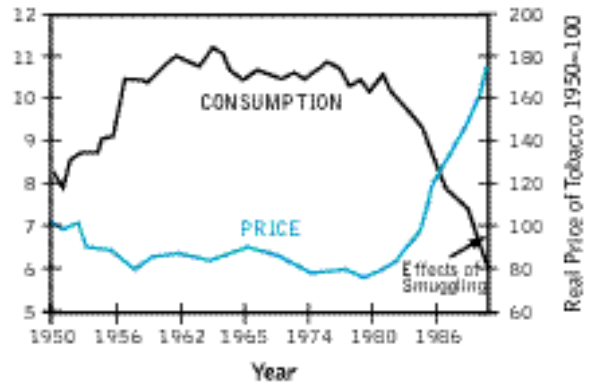
Therefore, a very consistent inverse relationship exists between consumption and price, which is shown in Figures 1, 2 and 3 for different countries. The negative relationship between price and consumption has also been seen in behavioral studies that have estimated elasticities very close to those from econometric studies, suggesting a very consistent relationship in humans and even in laboratory experiments with non-human species. These studies examine the impact of price and other factors on the self-administration of an addictive substance, using, for example, pulls on a plunger to enable subjects to receive a puff on a cigarette (2).

Most of the recent econometric studies on the relationship between price and consumption have applied either myopic or rational addiction models to aggregate data. Myopic models assume that smokers discount the future consequences of their current consumption completely. In contrast, the rational addiction models assume that smokers account for, to some extent, the future consequences of their current consumption decisions.

Most econometric studies on the price effect of cigarette consumption are limited to the use of aggregate data

and cannot evaluate the differential impact of cigarette prices on smoking in subgroups of the population, such as youth, adolescents, or women. However, some studies have used individual level or survey data to examine differential effects of pricing on gender and age. These studies have several advantages in avoiding estimation problems, and may generate more stable parameter estimates. Because they use individual level data, they can also obtain separate estimates for prevalence price elasticity (participation elasticity) and consumption price elasticity (conditional demand elasticity conditional on being a smoker). One concern with these studies is that self-reported data on smoking tends to understate actual

FIGURE 2: REAL CIGARETTE PRICES AND REAL CIGARETTE CONSUMPTION, CANADA, 1950-1991



Source: (4)

consumption, when compared with aggregate sales. However, if the underreporting is systematically treated as being proportional to true consumption across groups and over time, then estimates of elasticity will not be systematically biased (2).

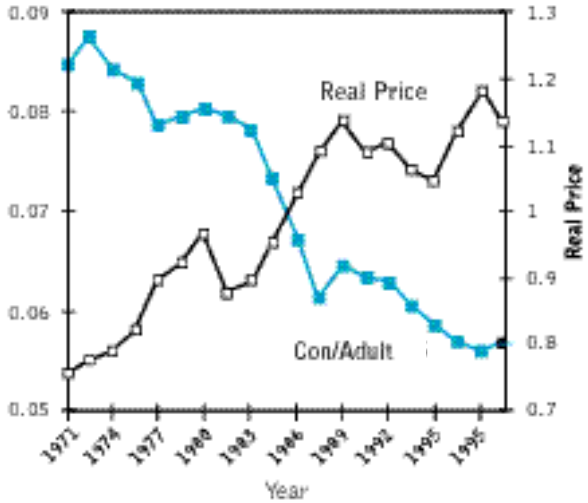
Price elasticity studies on gender

Studies that have used individual level data and examined smoking in women are summarized in Table 1. As this table shows, Townsend et al. found that women were generally more responsive to price than men and that both men and women in lower socioeconomic groups were more sensitive to price than those in higher income groups (11). They also examined the responsiveness of men and women and young people to health publicity, which are the effects of health publicity and other social trends, including social acceptability and smoking restrictions in the workplace and public places. They found women of all ages, including teenagers, to have been less responsive to health publicity than men. They found that response to health publicity decreased with age. For women, health publicity was significant only for the very highest socioeconomic groups.

Thus, for men and women in lower socioeconomic groups with higher price elasticities, tax increases would have the greatest impact, and these would also be men and women with the highest smoking rates and mortality. This therefore bodes well for narrowing the gap in terms of the inequality of health outcomes by a tax increase; however, it does not yet address issues relating to the additional burden borne by continuing smokers in these social groups, who will be paying more for their addiction. If, as in this study, price elasticities were consistently higher for women than for men, then higher prices would induce women to quit smoking more quickly than men. The study showed that among teenage women, the only age group in which women smoke more than men, women would be more affected by price rises. Cigarette price rises also have a longer-term indirect effect via parents who smoke, as the probability of a young person becoming a regular smoker is strongly related to parental smoking.

This study also examined the effect of price on both prevalence of smoking and actual consumption levels. Price had a significant effect on the prevalence of smoking in men and women in the lowest socioeconomic groups. These are the groups for whom prevalence is highest. Women in lower socioeconomic groups showed a higher and significant price elasticity of smoking

FIGURE 3: REAL CIGARETTE PRICES AND REAL CIGARETTE CONSUMPTION, SOUTH AFRICA 1970-1989



Source: (4)

prevalence. The number of cigarettes smoked by women with low income seemed not to vary with price changes in the expected way. The explanation given for this is that, while they may respond more than other groups to price increases by quitting, those who continue to smoke will smoke cheaper, smaller or hand-rolled cigarettes rather than reduce the number of cigarettes smoked.

Most studies from the United Kingdom support the conclusion that women are more price-responsive than men (5, 10, 11), although differences across socioeconomic groups and genders are not always consistent and the actual differences between the genders are not always significant.

Other studies, primarily from the United States, have derived the opposite conclusions concerning relative price responsiveness by gender (6, 7). These studies have also used individual level data taken from large-scale surveys. Lewit and Coate used data from the 1976

TABLE 1: COMPARISON OF PRICE ELASTICITY ESTIMATES BY GENDER

DATE	STUDY	COUNTRY	ELASTICITYESTIMATE: WOMEN	ELASTICITYESTIMATE: MEN	COMMENTS
1973	Atkinson & Skegg [5]	UK	Women relatively price sensitive (-0.17 to -0.48)	men don't respond to prices	Manchester School of Economic and Social Studies, separate studies for men and women
1981	Lewit,Coate & Grossman [6]	US	price has smaller effect on prevalence rate for girls	higher prevalence elasticity for boys	US Health Examination Survey for 1966 to 1970,prevalence elasticity -1.2,consumption elasticity -1.4, overall price elasticity -1.44 for 12 to 17 year olds
1982	Lewit & Coate [7]	US	-0.30 20 to 25 years,not significantly different from zero	-1.40 20 to 25 years, higher for younger men than older men	1976 National Health Interview Survey, overall price elasticity –0.42,age group 20 to 25 years old overall price elasticity -0.89
1985	Mullahy [8]	US	-0.39	-0.56	Individual level data from 1979 National Health Interview Survey, overall price elasticity -0.47, myopic addiction model,more addicted smokers less responsive to price
1990	Chaloupka [9]	US	Insignificant effect of price on demand	-0.60 long run	Second National Health and Nutrition Examination Survey, rational addiction model,less educated persons more price responsive (-0.57 to -0.62), younger and less educated persons more myopic,men more myopic than women
1992	Borren & Sutton [10]	UK	-1.04 high SEG, -0.45 low SEG	-0.69 high SEG, -0.31 low SEG	Tobacco Advisory Council survey from 1961 to 1987,no evidence of systematic increase in price responsiveness across SEGs, inconsistent results for men and women in middle SEGs
1994	Townsend,Roderick & Cooper [11]	UK	-0.61 overall, -0.88 women in low SEG, insignificant high SEG	-0.47 overall, -1.02 men in low SEG insignificant high SEG	British Household Survey data 1972 to 1990,econometric multiple regression
1997	Lewit,Hyland, Kerrebrock & Cummings [12]	US	young girls less price responsive than boys	young boys much more price sensitive with respect to smoking and smoking intentions	COMMIT 9th grade school-based surveys in 1990 and 1992
1998	Chaloupka & Pacula [13]	US	-0.451 white women, -0.453 black women	-0.861 white men, -1.646 black men, participation elasticity twice as large as for women	1992 to 1994 Monitoring the Future Surveys, white and black youths respond differently to anti-tobacco activities
1998	Farrelly & Bray [2]	US	-0.09 prevalence elasticity, -0.10 consumption elasticity, -0.19 overall	-0.18 prevalence elasticity, -0.08 consumption elasticity, -0.26 overall	14 years of National Health Interview Survey data pooled from 1976 to 1993, prevalence price elasticity -0.15,consumption price elasticity -0.10, total elasticity -0.25
1999	Tauras & Chaloupka [14]	USA	-1.19 price elasticity of cessation	-1.12 price elasticity of cessation	Monitoring the Future Surveys longitudinal data of high school seniors,educated females higher probability of quitting, young women living alone lower probability

Note:SEG = socio-economic group

National Health Interview Survey to examine the effects of price on cigarette smoking by age subgroup and gender, concluding that men, particularly young men, were very responsive to price, while women were generally insensitive to price (7). Mullahy found that more addicted smokers are less responsive to price (8), while Chaloupka found that younger, less educated, lower income persons and men will be relatively more responsive to changes in the price of cigarettes (9). Farrelly and Bray found that young men are more responsive to price than young women (3). They concluded that blacks (0.32) were about twice as responsive as whites (0.14) to cigarette prices, while Hispanics were even more price-sensitive (1.89). Smokers aged 18–24 years (0.58) were substantially more price-responsive than smokers aged 40 years or more (0.10). Low income families (0.29) are found to be more price-sensitive than high-income families (0.17). Therefore lower income, minority, and younger populations would be more likely to reduce or quit smoking in response to a price increase in cigarettes. For men, the prevalence price elasticity (0.18) was higher than for women (0.09), although the consumption price elasticity was slightly lower (0.08 versus 0.10), though the overall price elasticity was also higher (0.26 versus 0.19). Therefore, with a 1 percent increase in cigarette prices, men are more likely to quit completely, while women are more likely to continue to smoke but smoke fewer cigarettes per day.

> Tax increases would lead a significant number of young adults to quit smoking.

Chaloupka and Pacula also found the participation elasticity of young men to be twice as large as that for young women (13). They found that young black men have a higher price elasticity than young white men and that white and black youth respond differently to tobacco control policies. While white youths may be more responsive to anti-tobacco activities and clean indoor air restrictions, black youth smoking rates are more likely to be influenced by smoker protection laws and restrictions on youth access.

Where most studies show an inverse relationship between price and smoking participation, they are unable to distinguish whether this decrease in participation is a result of decreased initiation or increased cessation. Tauras and Chaloupka (14) showed that price is positively related to the probability of smoking cessation for both young males and females. As a result, tax increases would lead a significant number of young adults to quit smoking. In fact, the results showed that with a 10 percent increase in the real price of cigarettes, the probability of smoking cessation would increase by approximately 11.2 percent among men and 11.9 percent among women. The study also found that policies restricting smoking in private workplaces would have a positive impact on the probability of cessation among young employed females, while other restrictions in public places would have little effect and in general these laws would have no significant impact on young male smoking cessation. The probability of cessation for whites was significantly higher than that for blacks, and the probability of quitting was also inversely related to age. It was found that females who lived alone were significantly less likely to quit smoking than females who did not live alone, and females with a higher education or attending college were more likely to quit.

Price elasticity studies on youth

Studies that have used individual level data to examine price effects of smoking in youth are summarized in Table 2. Given that most regular smokers start smoking in their youth, it is important to try and understand what policies might be effective in this age group to prevent young people from starting, or to get them to quit.

Although some studies, such as those of Wasserman et al. (16) and Chaloupka (17), found youth to be less price-sensitive and found no statistically significant difference between youth and adult price responsiveness, respectively, most other studies have found youth to be much more price-sensitive than adults. Townsend et al. also found that youths (16–19 years) and young adults (20–24 years) were less responsive to price than adults (11). As Table 2 illustrates, this finding is contrary to those of most other studies, which have found young people to be more price-responsive than adults. Young people generally have relatively low incomes, with a high proportion of it available for discretionary expenditure, so that changes in relative price are more likely to affect their smoking patterns.

Most researchers assume that price effects on youth reflect the impact of price on smoking initiation, while the estimate for adults reflects the effects of price on smoking cessation. Some studies of smoking initiation found results which suggest that prices had an insignificant effect on initiation of smoking by young people (24, 26, 27). However, some of these studies suffered from econometric problems associated with the use of

retrospective data. When missing data are imputed instead of deleted (23) and when larger samples that include a number of determinants of cigarette demand (such as restrictions on smoking) are used (20, 25), there is relatively conclusive evidence that price increases will not only reduce the number of cigarettes smoked but also reduce the overall prevalence among younger smokers. The majority of studies show that youths are more price-responsive than adults, suggesting that excise tax increases leading to price increases would be a very effective means of reducing cigarette smoking among youth. This would lead to permanent reductions in smoking in all age groups.

Several studies have found that restrictions on smoking in some public places, such as restaurants and schools, would have a significant effect on smoking prevalence and would clearly influence the decision to smoke by

TABLE 2: COMPARISON OF PRICE ELASTICITY ESTIMATES BY AGE

DATE	STUDY	COUNTRY	ELASTICITYESTIMATE: YOUTH	ELASTICITYESTIMATE: ADULTS	COMMENTS
1981	Lewit,Coate & Grossman [6]	US	Prevalence elasticity -1.20,Consumption elasticity -1.40, overall elasticity -1.44	Much lower for adults	US Health Examination Survey for 1966 to 1970 for 12 to 17 year olds
1982	Lewit & Coate [7]	US	Prevalence elasticity -0.74, overall price elasticity -0.89	Prevalence elasticity -0.26, overall elasticity -0.42	1976 National Health Interview Survey
1983	Grossman,Coate, Lewit & Shakotko [15]	US	Prevalence elasticity -0.76	Much lower for adults	National Surveys on Drug Abuse for 1974, 1976,1977 and 1979
1991	Wasserman,Manning, Newhouse & Winkler [16]	US	Price elasticity estimate for 12 to 17 year olds not statistically different from adults	Relatively unresponsive to price, but increasing over time, -0.283 in 1988	Second National Health and Nutrition Examination Survey from 1976 to 1980 for 12 to 17 year olds,Health Interview Surveys of 1970s and 1980s for adult estimates
1991	Chaloupka [17]	US	Youth more myopic and less price sensitive		Rational addiction model applied,17 to 24 year olds
1994	Townsend,Roderick & Cooper [11]	UK	Higher elasticities across all age groups		British Household Survey data 1972 to 1990
1995	Evans & Farrelly [18]	US	Overall price elasticity -0.63,prevalence price elasticity -0.36	Overall price elasticity -0.22 for full sample, prevalence elasticity -0.11	13 National Health Interview Surveys between 1976 and 1992,43000 persons aged 18 to 24
1996	Chaloupka & Grossman [19]	US	Overall price elasticity -1.31		Large dataset of 50000 8th,10th and 12th grade youths from 1992 to 1994 Monitoring the Future Surveys
1997	Chaloupka & Wechsler [20]	US	Overall price elasticity -1.11 (range -0.91 to -1.31),prevalence price elasticity -0.52	Consensus estimate for adults -0.4	1993 Harvard College Alcohol Study of 16570 students at 140 colleges and universities
1997	Lewit,Hyland, Kerrebrock & Cummings [12]	US	Smoking participation elasticity -0.87, intention to smoke among young non-smokers -0.95		COMMIT 9th grade school based surveys in 1990 and 1992
1998	Chaloupka & Pacula [13]	US	Prevalence and overall price elasticity higher		1994 Monitoring the Future Project, stringently reinforced laws on youth access would reduce youth smoking
1998	Evans & Huang [22]	US	Youth smoking becomes more price sensitive over time, elasticity -0.50 for prevalence from 1985 to 1992		Monitoring the Future Surveys from 1977 to 1992
1998	Dee & Evans [23]	US	Price elasticity of smoking onset -0.63		National Education Longitudinal Survey of 1988, study impact of price on smoking initiation of 8th,10th and 12th grades
1998	DeCicca, Kenkel & Mathios [24]	US	Price elasticity of smoking onset ranging from -0.03 to -0.51		Re-examination of National Education Longitudinal Survey of 1988 data
1999	Tauras & Chaloupka [25]	US	Overall price elasticity -0.79		Longitudinal data from Monitoring the Future surveys from 1976 to 1993 for young adults aged 17 to 35

Longitudinal data from Monitoring the Future surveys from 1976 to 1993 for young adults aged 17 to 35

young adults (20). Chaloupka and Pacula also found that youths would be less likely to smoke and would smoke fewer cigarettes if there were aggressive and comprehensive approaches to limiting youth access (21).

Lewit et al. (6) suggested that young people may be more price-sensitive than adults, because they have been smoking for a shorter time and so can adjust more quickly to price changes than long-time smokers who are addicted. The fraction of disposable income spent on cigarettes by the young smoker is also likely to be greater than for an adult smoker. These are all important reasons why young smokers are more likely to be affected by price increases than adults. This creates an important opportunity to discourage young people from taking up smoking. Because youth have higher discount rates than adults, they do not internalize risks and give less weight to future consequences from their current consumption. Lewit et al. (6) also argue that youth are more easily influenced by bandwagon or peer group effects. That is, they are more likely to smoke if their parents, siblings, and peers also smoke. Higher prices could discourage young people from smoking by the price mechanism's working through the same peer or bandwagon channel; thus, a price increase will not only reduce a youth's smoking but indirectly also peer smoking. Given evidence that individuals are far less likely to start smoking after reaching their mid-twenties, those young smokers who never begin to smoke because of a price increase would never become regular smokers. As a result, over a longer period of time, aggregate smoking and the detrimental health effects it imposes would be dramatically reduced.

Findings on price elasticity

Generally, the most conclusive evidence relates to the price responsiveness of youth to tobacco prices. Price elasticity estimates relating to persons with lower incomes, in lower socioeconomic groups, and with lower educational levels also suggest that these persons will be more responsive to a price change. Evidence is fairly convincing that younger, lower-income, less-educated and minority subsamples will be more price-responsive. Developing countries as a whole also have more price-responsive consumers than developed countries with lower elasticities. However, it seems that the verdict is still out as to whether there are in fact significant differences between men and women in their response to price increases, if any at all. If such differences do exist, it still remains to be seen whether results would be generalizable across cultures and countries. It is clear that more studies of this nature are required, particularly outside the United States and United Kingdom, to examine whether such differences do indeed exist and are in any way significant.

Given the more conclusive evidence surrounding the price elasticity estimates relating to youth, this is a very powerful and potent tool to use in tobacco control. The price responsiveness of youth bodes well for price increases in helping to prevent young people from ever becoming addicted, as most smoking initiation takes place during the teenage years. In addition, lower prevalence in this age group will also lead to permanent reductions in tobacco use in all age groups. Furthermore, even if there is no statistical difference between men and women in terms of price responsiveness, both subsamples' demand does display an inverse relationship with price. Therefore, price increases will lead to reductions in consumption in both men and women. In general, individual level data studies suggest that half or more of the effect of price on reduced consumption is on smoking prevalence, while the remainder of the effect is on continuing smokers with lower consumption (28). Therefore, given the link between price increases and reduced consumption and the resulting health benefits of both quitting completely and smoking less, price increases can lead to substantial reductions in morbidity and mortality.

Empirical evidence on price elasticity estimates has been somewhat mixed about the myopic addiction model versus the rational addiction model. However, both types of models produce elasticity estimates that predict larger long-run elasticities and thus support the notion that long-run reductions in consumption from price increases will generally be greater than short-run effects (28). The long-run benefits of higher tobacco prices will therefore be even greater than the short-run benefits.

No studies to date using individual level data to examine consumption in population subgroups have come from developing countries. This may be due to the difficulty and infrequency of obtaining survey data, given the cost, the geographic dispersion of the population, and illiteracy levels. Such efforts would add to our understanding of the differential impact of pricing on youth, adolescents, ethnic minorities and women in developing countries and how pricing policies could best be applied. Given that the burden of the tobacco epidemic is shifting to these populations, it would be prudent to examine the effects that pricing policies would have on them.

Taxation

The taxation of tobacco products is a universal practice. Wherever tobacco products are consumed, they are taxed. Taxes serve different objectives and have different effects depending on the prevalence of smoking, the behavioral impact of the tax and the pricing effects. The impact of excise taxes on cigarette demand depends on

the extent to which changes in excise taxes are reflected in cigarette prices and the responsiveness of cigarette demand to price (the price elasticity). Excise tax increases will discourage smoking to the extent that excise tax increases are passed on to smokers in the form of higher prices, and there is substantial evidence that a tax increase often leads to a more than proportional increase in retail price (29).

In general, in most countries it can be found that with a given tax increase, price will rise by an amount equal to or greater than the tax increase (28). This has been explained by the addictive nature of the product and as a result of the coordinated oligopolistic nature of the tobacco industry in many countries (30).

As has been shown, price is an important determinant of the demand for cigarettes, and similarly the excise tax is an important component of price. Therefore, cigarette taxes are a very visible tool for both controlling tobacco consumption and raising governmental revenue. Given the inelasticity of demand, tobacco is an ideal product to tax, as it is an easy source of revenue. Cigarette excise taxes are administratively relatively easy to apply and low-cost; and given the demand elasticities, they can produce significant public health benefits by discouraging smoking, particularly among children.

Abasic premise of taxation policy is the Ramsey Rule, which states that tax rates should vary inversely with the elasticity of demand for products (31). Taxing goods with inelastic demand will minimize any economic distortions that result from the tax, and hence any social welfare loss. Therefore, on goods with highly inelastic demand for which consumers'demand is least affected by price changes—such as cigarettes, which have an addictive capacity—the highest taxes should be borne. From this perspective, the primary effect of low elasticity of demand, as is generally the case with cigarettes, is to greatly increase the flow of revenue to government.

Tobacco taxes have traditionally been classified as "luxury" or "sin" taxes that are susceptible to high tax rates. Because such recreational chemicals are generally not seen as necessities of life, but at the same time are noncriminal substances, they have borne a high tax burden (32). From this point of view, they are a popular source of government revenue.

Cigarettes are taxed in a variety of ways, most commonly as excise taxes, value-added or sales taxes, import duties and, in the case of state-owned industries, monopoly profits. An excise tax is simply a tax levied on the consumption of a good wherein a particular government's excise revenue department takes a percentage of the selling price. The excise tax is applied by manufacturers prior to any sale to a retailer for resale; therefore, the manufacturer would have included the cost of the excise payment in its cost structure already. The retail price of cigarettes, net of sales tax or value-added tax, thus consists of the producer's price plus the excise tax. An increase in the excise tax therefore causes an increase in the equilibrium price and a resultant decrease in the equilibrium quantity demanded (32).

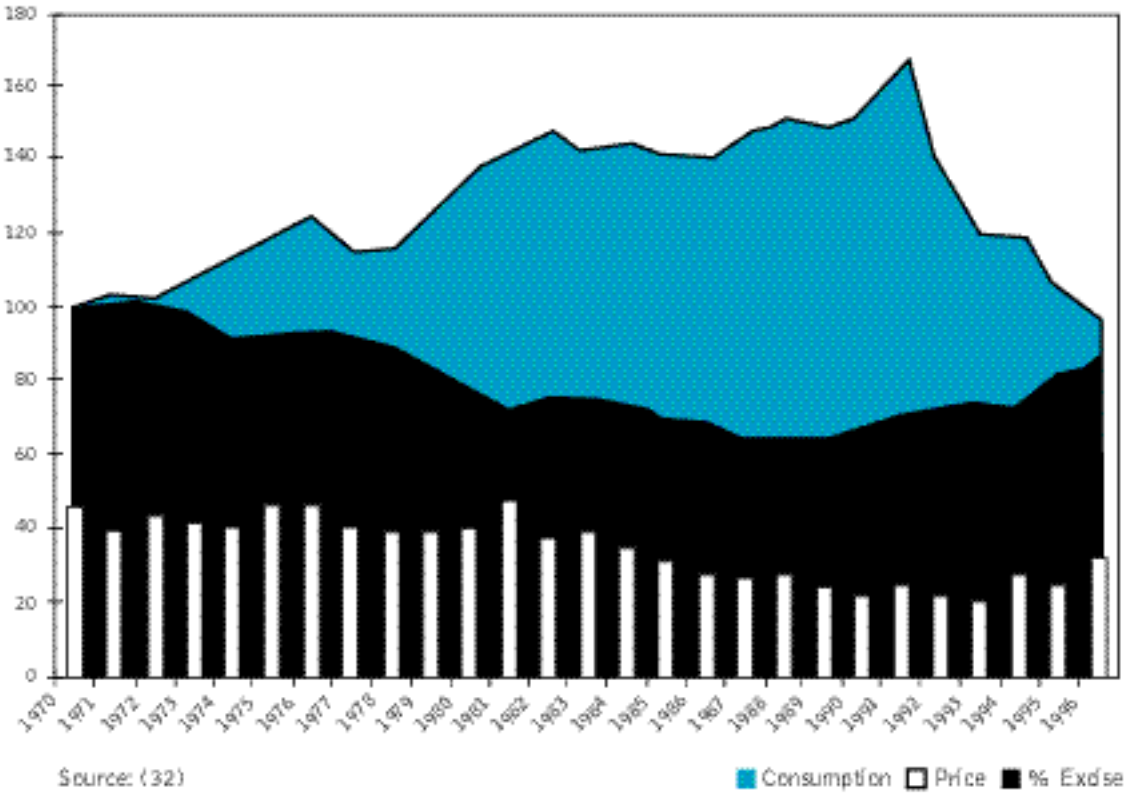
Most cigarette excise taxes are set as a specific amount per a certain number of cigarettes. Therefore, a fixed amount is added to the base price of the product. Other excise taxes are based on the weight of the tobacco in the cigarette. There are different types of ad valorem taxes that are levied as a percentage of price. Some countries impose differential taxes on imported cigarettes versus domestically produced cigarettes, while other countries may impose differential taxes based on other factors, such as whether the cigarettes are longer or unfiltered. In previous years in the United Kingdom, there were differential taxes on cigarettes with a high tar and nicotine content (2).

The tobacco industry will probably seek ways to minimize the impact of these taxes. The hypothesis is that levying a tax on a commodity results in a manufacturer refocusing production on characteristics of the commodity not subject to the tax. For example, a tax levied on cigarettes may induce manufacturers to produce a "slow-burning cigarette," which increases the quality of the cigarette and improves the production process. The "slow-burning" characteristic of the cigarette is not subject to the tax (29). Thus, several countries have turned to "king-size" cigarettes or value-added packs as ways to reduce different types of taxes (28).

In addition, as a way to keep retail prices lower and consumption higher, the tobacco industry may use different methods to maintain their consumer base, such as the use of generic brands and discount coupons.

Like the tobacco industry, smokers may also engage in compensating behaviors as a result of tax and price increases. In other words, in response to tax hikes, they may smoke longer cigarettes or ones with higher tar and nicotine contents; or, because cigarettes and other tobacco products are substitutes for one another, they may switch to hand-rolled cigarettes, pipes, snuff, chewing tobacco or other forms of smokeless tobacco. Thus, tax increases need to be applied symmetrically

FIGURE 4: THE REAL RETAIL CIGARETTE PRICE, PER CAPITA CIGARETTE CONSUMPTION, AND THE PERCENTAGE OF EXCISE TAX PER CIGARETTE IN SOUTH AFRICA, 1970-1997 (1970=100)



across all types of tobacco products in a manner that equalizes their retail prices, so that consumers do not turn away from relatively higher-priced products towards those with relatively lower prices and thus erode any health benefits.

Excise taxes need to keep pace with inflation; otherwise, as the prices of other goods and services increase more rapidly over time, the real price of tobacco or the real value of the tobacco tax will fall. This has been witnessed in several countries. In contrast, the real value of an ad valorem tax is maintained when the prices of tobacco products rise in conjunction with those of other goods and services. Thus, the real value of revenues generated by ad valorem taxes stays relatively stable over time, and they are favored by the tobacco industry because they can keep the base price, and therefore the tax, at a relatively low level. Excise taxes are relatively easy to collect and therefore less costly administratively. However, excise taxes are more susceptible to losing their value, and they need to keep up with inflation in order for the real value of the tax to not be eroded. Thus, taxation policies must frequently address this issue to ensure that the real value of the tobacco excise tax is maintained over time. This became a problem in South Africa; excise taxes did not keep pace with inflation, leading to a fall in the real price of cigarettes and a concomitant rise in consumption during the period up to 1991, as shown in Figure 4.

In countries that have a tobacco industry that is monopolized by the state, governments may collect revenues by increasing the price of the tobacco products they produce and distribute. The indirect taxation from such a state monopoly can generate substantial government revenues. Monopoly profits earned by the Taiwan Tobacco and Wine Monopoly Bureau during the period prior to market liberalization accounted for more than 10 percent of the government's total tax revenue, and about half of this came from the sale of tobacco. In such a system, the retail price of cigarettes consists of production costs and monopoly profits. Since trade liberalization in 1987, Taiwan has used an excise tax to replace the monopolistic profit of imported cigarettes. The importance of cigarette monopoly profits has fallen steadily as revenues from other taxes have increased, and they now contribute

around 2 percent of total government tax revenue (33). Historically, however, the monopoly in Taiwan has been a very important source of government revenue.

There are large differences in tax rates applied across developed and developing countries. Most countries that have used taxation as a successful tobacco control tool have had tax rates of around two thirds to three fourths of the price of cigarettes. However, many middle and lower income countries still have tax rates that fall well below 50 percent and 30 percent of the retail price of cigarettes, respectively.

Taxation and pricing are some of the most powerful tools for bringing about reductions in tobacco use among men and women, and given the price responsiveness of youth, it is an equally powerful tool with which to prevent children from ever starting smoking. Given that many countries still have extremely low tax rates, there is ample room to raise tax rates to levels close to those of countries that have been more successful in tobacco control, with tax rates around two thirds or three fourths of the price of cigarettes. With regard to women, taxation may not be entirely successful in reducing smoking if there are more pressures on women that cause them to continue to smoke. Therefore, non-price measures in conjunction with price measures may be more effective in helping women to quit. However, taxation is not sensitive in this respect, and it cannot be levied differentially on different demographic groups, even though its effect may be slightly different among them. For example, given the evidence relating to young people's price responsiveness, higher taxation rates will be an extremely valuable and cost-effective tool in terms of prevention, as tax increases will have a greater differential effect on youth.

Taxation is a relatively blunt instrument. As taxes are raised, smokers will tend to smoke less but pay more for the cigarettes they do purchase. Thus, in fulfilling the goal of preventing young people from starting, taxation would be imposing a cost on continuing smokers. These costs may be considered acceptable, depending on how much a society values prevention of smoking uptake. One long-term effect of reducing adult consumption may be to further discourage young children from smoking.

Tax revenue

Tobacco tax revenue has accounted for 3–5 percent of total government revenue in most developed countries (28), although its importance has steadily been declining. In some middle income countries, tobacco tax revenue accounts for an important share of total government revenue, but this is less so in lower income countries.

Given the inelasticity of demand for tobacco products and the higher elasticity in the long run, there is great potential for countries to raise revenue from tobacco. For example, in South Africa, with an estimated long-run price elasticity of 0.68 (32) and where taxes now account for 40 percent of the price, a permanent doubling of the cigarette tax would reduce demand by over 27 percent in the long run (assuming the tax is fully passed on to consumers) while increasing cigarette tax revenues by nearly 50 percent (28). Tobacco taxes would then account for nearly 2 percent of total government revenue. However, because the government did not allow tobacco taxes to keep pace with inflation in the 1970s and 1980s, foregone excise revenue was substantial.

> Excise taxes need to keep pace with inflation; otherwise, as the prices of other goods and services increase more rapidly over time, the real price of tobacco or the real value of the tobacco tax will fall.

Revenue-generating potential will be highest where the demand for the product is more inelastic or where tax as a percentage of price is relatively low. Therefore, for a country like Zimbabwe, which has an elasticity of about 0.85 (which is relatively more elastic), very low consumption and thus a small tax base, and a relatively high tax rate as a percentage of price (80 percent), there is less room to increase tobacco taxes. Some level of revenue maximization has probably been achieved (34).

Nevertheless, for most countries there is probably still ample room to increase taxes and raise valuable tax revenue. A10 percent tax increase will, on average, lead to a 7 percent increase in tobacco tax revenue. Therefore, even in countries where demand was more elastic or where taxes were already a high share of price, they would still lead to increases in revenue, at least in the short run. Given the economic models of addiction and the fact that demand will be more responsive to price in the long run, a permanent change in price will have an effect on demand that will grow over time to almost double that of the short-run impact (28). In addition, given the sensitivity of consumers—particularly youth—to price, permanent real increases in tobacco taxes will lead to greater reductions in prevalence and overall consumption. Therefore, tobacco taxes will lead to greater increases in tax revenue in the short run than in the long run.

Ultimately, if fewer people smoked and tobacco tax receipts were to fall in the long run, and if governments were to seek alternative sources of revenue, this might shift the tax burden to previous nonsmokers. However if the new revenues compensated for the loss of the former excise tax yield, then consumers as a whole would bear no additional tax burden. Thus, even a complete (and hypothetical) demise of the tobacco industry would create a governmental revenue shortfall only if the excise tax revenue was not replaced with an equal-yield revenue source. As former smokers shifted their consumption expenditure to other goods and services, tax revenue from these alternative sources would also be able to replace any lost revenue (35).

Taxes and tax revenues have also been applied in different countries in unique ways; for example, several countries (Canada, Finland, Denmark, Peru, Poland, Indonesia, Korea, Malaysia, Romania, Nepal and many US states) have earmarked tobacco taxes, where a dedicated portion of the tax goes towards funding tobacco-related education, counter-advertising, health care for underinsured populations, cancer research or other health-related activities. Tax revenues are used in several Australian states and in New Zealand to fund athletic and art events previously sponsored by the tobacco industry (28). Tobacco tax increases that are earmarked for tobacco control measures can generate even greater reductions in tobacco use than tax increases alone. While many finance ministries have concerns about the use of earmarked taxes for reasons relating to loss of control, rigidities in allocating general revenues and the domino effect of other sectors also wanting hypothecated taxes, it has been argued that earmarked tobacco taxes can help reduce the loss of producer and consumer surplus from higher taxes. Earmarked taxes can also be used to target lower income populations who continue to smoke, and such transfers can therefore help to reduce inequalities in health outcomes. These taxes could be used to subsidize cessation programs and nicotine replacement therapies to assist and support continuing smokers. Therefore, if women do struggle more than men to quit and if women in lower socioeconomic groups continue to smoke, support services for them funded by these taxes could help to reduce the burden of taxation falling on them and the resultant inequalities in health.

Social costs of tobacco use and the call for tobacco taxation

Another reason why there are strong calls for tobacco taxation is that smoking (it is argued) imposes net costs on society and smokers should bear the burden of these costs. Therefore, taxes should be used to improve efficiency in this situation, and they are seen as an appropriate "user fee" that covers the social cost of smoking (28).

The cost-of-smoking studies that have examined the costs associated with the externalities of smoking have been criticized for several flaws and are very controversial. The costs fall into two broad categories: the financial consequences of tobacco use on health care, life insurance, pensions and other collective programs, and the health costs associated with exposure to environmental tobacco smoke (ETS) (28).

Ample evidence shows that the direct medical costs associated with treating tobacco-related illnesses are substantial. Several problems have plagued these studies in attempting to measure other costs. Some of these problems are discussed below.

Many of these studies have used the "human capital" approach to valuing years of life lost due to premature mortality, and have been severely criticized as effectively placing no value on human life at all. Several costs have also been omitted from these studies, including the costs of treating diseases due to ETS, the costs of fires caused by cigarettes and the costs of treating low birthweight babies born to smoking mothers. Lost earnings from work absences due to morbidity have often been excluded as well. Mostly, the intangible psychological costs of pain and suffering have never been quantified. The way in which smoking complicates the course of certain illnesses, for example, or prolongs recovery from surgeries has never been established or taken into account by these studies. Nor have other, relatively minor issues such as the transportation costs of patients or the additional laundry costs of smokers been considered (2). In addition, most studies have not considered the costs of health care that is privately funded.

Another difficult issue concerns whether the effect of a person's tobacco use on his or her spouse and children should be counted as an internal or external cost. Many earlier studies assumed the family as the decision-making unit, and thus a child's exposure to ETS by parents would be considered an internal cost. This may be problematic when applying this notion to fetal and infant exposure, as children are relatively powerless to alter their parents'consumption decisions (28). Furthermore, health problems that develop as a result of such exposure become costs which public institutions have to bear. Therefore, many costs associated with ETS are now being considered external to the family.

Other confounding issues in these studies have not been studied either. At any given age, smokers incur greater health care costs than nonsmokers. However, precisely because smokers have a shorter life span, nonsmokers have more years in which to incur health-care costs. In particular, nonsmokers have more years of old age in which they can be plagued by chronic illness and cost taxpayers millions in health-care expenditures. There is no definitive resolution yet to the question of whether smokers'higher annual health care costs outweigh nonsmokers'additional years of costs (36).

Several caveats are necessary, however. First, and by far most important, the possibility of an approximate equality of the two expenditure streams of smokers and nonsmokers does not mean that the two situations are equally desirable. Nonsmokers spend their health care money over a longer, healthier life. Health-care costs associated with the attainment of a tobacco-free society would therefore seem a more cost-effective social investment in health. In addition, nonsmokers may work longer due to a longer working life and have greater productivity-related contributions, thereby also contributing more to funding the health care system and offsetting later costs.

A further flaw in the analysis of the social cost of smoking is that differential insurance premiums are not considered. In most cases, smokers already pay more than nonsmokers. Also, an expansion of the number of people living into the retirement years would have a financial impact on pension plans. Such plans would see a substantial increase in their financial obligations, because their benefit provisions currently reflect actuarially the reduced life expectancy of smokers. They are currently based on the actuarial realities of a smoking society. In other words, by dying prematurely, smokers "save" pension plans millions of dollars, a "savings" that would be lost if everyone ceased to smoke today. Many studies do not consider these implications when calculating the economic costs of tobacco (37).

Studies focusing on the social and economic costs of smoking have generally been subject to many of the above criticisms. Many have argued that consideration of medical and pension offsets makes the net social cost of smoking small; however, others have argued that in no other area of social policy analysis is death treated as a benefit (2). Calculating the net social cost of tobacco use is therefore exceedingly difficult.

Several studies conducted at a national level (38) have examined the economic impact of tobacco by comparing the costs and benefits of tobacco in a spreadsheet-type formula, where the benefits might include tax revenues to government and earnings and incomes derived from tobacco-related employment. The costs typically include costs to government (such as health care costs from tobacco-attributed illnesses and the trade imbalance from importing foreign cigarettes), to business and industry (such as sick leave, premature death, and reduced productivity due to tobacco-related illnesses, time-off for smoking and damage to property from smoking), to individual smokers (for loss of income due to illness and direct health care costs) and to the environment (due to deforestation for wood-curing of tobacco, clearing of litter and fires caused by cigarettes). These studies have equally had difficulties in measuring and including all types of costs and benefits and are notoriously problematic. More often than not, the costs are largely underestimated in such studies.

This debate is important. At its heart lies the call for higher cigarette taxes, under the premise that smokers are imposing an economic burden on society and ought to pay for it, and that governments should level the balance sheet and try to recoup some of the costs of tobacco by imposing higher tobacco taxes.

Concerns about tobacco taxation

Often, concerns about cigarette taxation as a health promotion tool arise. These include policymakers' consideration of what the appropriate level of taxation might be and issues surrounding the efficiency and equity of such taxes. If more low-income people smoked, cigarette taxes might impose a regressive burden on low-income taxpayers. Therefore, there is a dual concern about the increasing burden of smoking-related diseases on low-income groups and the implications of price increases for low-income smokers. Related concerns about increased taxation also include the effect such taxation may have on cross-border shopping and smuggling and the effect it may have on the tobacco industry regarding employment, and more broadly the macro-economy and trade balances. These last two issues are discussed in more detail under the supply-side policy responses.

A consideration is that governmental interest should be to set a cigarette tax that is fair, appropriate and just. One view would be that the taxed sale of cigarettes is unobjectionable at any level, because it is a voluntary transfer of money. If it were not fair to customers, they would not complete the transaction. There is no government coercion involved in the activity, so there should be no concerns about the fairness or justice of the tax. This is a questionable argument, however, as smokers who are addicted to nicotine could be unjustly exploited to raise government revenue, whereas the burden of

supporting the government should be spread more evenly across citizens and activities. In addition, nonsmokers, such as spouses and children, may suffer economic deprivation because of the high tax burden. Therefore, the voluntary character of the tobacco purchase does not make cigarette taxes immune to charges of unfairness. Jurisprudence remains an important aspect of the use of taxes which cannot be ignored in making judgements about the optimal level of taxation (39).

Given that proportionately more lower-income people smoke than people with high incomes, the burden of tobacco taxation is experienced disproportionately by the poor, and the tax is often criticized as being regressive. Tobacco taxation can violate notions of both horizontal equity (where "equals" or individuals that are identical except for their smoking behavior should be treated equally) and vertical equity (where the rich and the poor should not be treated equally due to differences in income). Vertical equity implies that individuals with the greatest ability to pay should carry the highest tax burden—in other words, marginal tax rates should be higher for the rich. Tobacco taxes clearly violate this principle. The problem is exacerbated where as income falls, tobacco taxes as a share of income or total expenditures rise. Therefore, tobacco taxes are regressive where tobacco use is more prevalent among persons with lower incomes.

However, recent evidence suggests that tobacco taxes may not be nearly as regressive as has been feared and that in fact tobacco tax increases may be progressive. This is because rich and poor consumers do not smoke and quit at the same rates following a price increase. This has recently been shown by differences in the price elasticity of demand for different socioeconomic groups, which suggests that the regressivity normally attributed to cigarette taxation is overstated. Studies have found the price elasticity of demand to be inversely related to social class, with the highest social classes being far less price-responsive than those in the lowest social classes (11). In the United States, less educated persons have also been found to be more price-responsive than more educated persons (17). Therefore, given the correlation between higher income, social class and education, and their lower elasticity, increased cigarette taxes would reduce differences in smoking among socioeconomic groups. Even though cigarette taxes may fall most heavily on lower income smokers, increases in taxes may be progressive given the larger reductions in smoking that occur among lower income smokers. The health benefits from tax-induced reductions in smoking would therefore be disproportionately larger for lower income groups. Thus, analyses that have failed to take into account the inverse relationship between elasticity and income overstate the regressive effect of tobacco taxes.

However, for persons in lower income groups who continue to smoke, support may be needed to reduce the perceived regressivity of tobacco taxes. Cessation therapies and nicotine replacement products and other support services could be offered to the poor, and earmarking of tax revenues could also help in subsidizing these services. Thus, revenues from such tax increases could be specifically earmarked for programs that target low-income populations or women and other vulnerable groups such as youth.

Health impact of policies

At the heart of the call for tobacco control policies, and higher taxes in particular, lies the benefit of decreasing smoking, especially among children, and avoiding premature mortality and morbidity. An important contribution by economists has been to link demand elasticity evidence with data on the health consequences of quitting smoking or not starting to smoke, primarily among children. Thus, policies can be simulated to estimate what approximate health gains would result from raising taxes. Usually this is done with assumptions relating to how many lifetime smokers die prematurely of a smoking-related illness (now believed to be 1 in 2), and how much of an effect a price increase will have on the numbers of people who smoke and the numbers of cigarettes smoked by those who continue. In this way, tax increases can be linked to the number of premature deaths that can be averted.

Both price measures and non-price measures can lead to substantial reductions in smoking, both in prevalence and in the amount of tobacco consumed. Moreover, as already mentioned, these measures can discourage young people from initiating smoking. Given the relationship between pricing and demand and the significant health benefits accruing from cessation, tobacco control measures and taxation in particular can avert millions of premature tobacco-related deaths.

World Bank estimates of the health impact of control measures on global tobacco consumption are striking (1). Using conservative assumptions, it was estimated that a sustained real price increase of 10 percent could lead to 40 million people worldwide quitting smoking and to deterring many more from taking up smoking. The number of premature deaths avoided would be 10 million, or 3 percent of all tobacco-related deaths, from this price increase alone. Four million of the premature deaths avoided would be in East Asia and the Pacific.

Another study examined whether higher tobacco taxes would improve birth outcomes for low birth weight births among pregnant women who smoke (40). Data used were from approximately 10.5 million births occurring in the United States over the period 1989–1992. A smoking prevalence elasticity of 0.5 was found for pregnant women; thus, it was concluded that increased cigarette taxes would significantly raise birth weight. Increased taxes would reduce the adverse health and development consequences associated with low birth weight births.

While the public health community continues to appeal for higher tobacco taxes on the basis of the social cost argument, few people would deny the justification of a tax increase based on the health benefits. Given the empirical and other problems of the social cost argument, this line of research may indeed be a very valuable pursuit in helping to convince policy-makers of the irrefutable health gains that can be achieved from tax increases.

Non-price measures

Advertising and promotion. Large amounts of money are spent by the tobacco industry around the world to promote the use of its products. Increasingly, the monies that have traditionally gone into above-the-line media such as television, radio, billboards, newspapers and magazines are being spent on promotional allowances to retailers, point-of-purchase materials, direct mail advertising, free samples, coupons, value-added offers, specialty items, endorsements and sponsorships. Because of advertising restrictions in certain countries, these below-the-line spending categories have been taking on increasing significance.

Women in particular have been strongly targeted by the tobacco industry as a potential growth market, and media campaigns have been geared towards presenting smoking as liberating, socially acceptable, sophisticated, sexy and slimming. This issue is addressed in the chapter *The Marketing of Tobacco to Women: Global Perspectives* by Nancy Kaufman and Mimi Nichter. In an increasing number of less developed countries, smoking is depicted as being linked with a cosmopolitan, urbanized, and affluent lifestyle, with women enjoying increased educational and career achievement and increasing spending power. The tobacco industry has made huge investments in targeting women and girls with aggressive and seductive advertising that exploits the notions of independence, emancipation, sex appeal, and slimness. This advertising erodes sociocultural constraints that would otherwise discourage women from smoking.

Economists have found that magazines'coverage of the health consequences of smoking were much reduced as their share of advertising revenue from tobacco companies rose (42). Warner et al. found that magazines which did not carry advertising were more than 40 percent more likely to cover issues relating to the hazards of smoking than those that had tobacco advertising (43). The difference was especially pronounced for women's magazines, with those that did not carry tobacco advertising being over 230 percent more likely to cover issues relating to the health consequences of smoking.

> It was estimated that a sustained real price increase of 10 percent could lead to 40 million people worldwide quitting smoking.

Until the early 1990s, there was a steady increase in cigarette advertising expenditures in women's magazines in the United Kingdom. Women's magazines are read by about half of all British women from all age groups and social backgrounds and are an ideal medium not only for promoting cigarettes to women but also for informing women about health choices. Asurvey in the 1980s showed that women's magazines were specifically being used to target teenagers and young women with tobacco advertising (44). The trend towards increased emphasis on cigarette advertisements in media aimed at women was also noted in the United States (45). Ironically, several editors of women's magazines who were surveyed in the United Kingdom claimed to have a policy of rejecting advertising for products known to be "dangerous," even though they would accept advertising for cigarettes, which kill 35,000 British women each year (44). The underreporting of the health risks of smoking is a particular concern for developing countries, where public awareness of the harmfulness of smoking is low and sometimes nonexistent.

Therefore, although women's magazines and magazines in general have probably seen a decline in spending on tobacco advertising (at least in the developed world), these monies are shifting increasingly into promotional activities that also target young women. For example, in South Asia, concerts by Madonna and Paula Abdul have been sponsored by tobacco companies; this helps to promote aspirational images of Western life and glamour in association with smoking (41). It is likely that

these kinds of activities will receive increasing financial backing by the tobacco industry as a means of promoting their products and as restrictions are placed on their ability to advertise.

The econometric consensus around the effects of advertising on smoking is still murky, primarily because of study design factors. It appears, however, that the positive effect of advertising on tobacco consumption has declined over time. This may be due to the fact that the markets in the countries studied are already quite mature. On the other hand, many authors have found no effect of tobacco advertising on cigarette consumption. The inconsistency of the findings is due primarily to the different models employed, the types of data used, and the variation in empirical methods across many studies (2).

With studies using aggregate-level industry data in particular, it appears that advertising has a small or negligible effect on aggregate cigarette sales. However, many researchers have suggested that there should be at least a small effect of aggregate cigarette advertising on aggregate consumption. Given that these econometric analyses of aggregate expenditures and consumption are trying to assess the impact of a marginal change in advertising expenditures on aggregate cigarette sales, it is not surprising that the effects of advertising on demand are mostly small or insignificant. Some of the problems with such studies include the problem of the measure used for advertising, the omission of important variables such as counter-advertising, and other technical problems in the modeling. One of the omitted variables is the level of advertising in all other industries, or external advertising; if all industries including cigarettes doubled their advertising, there would be no effect for cigarette advertising, since the effects would cancel each other out (46).

As with the demand analyses, it would be better to use more disaggregated data for future research on advertising and to include analyses of complete advertising and promotional bans. If data were measured over a relatively large range and used monthly or quarterly data, there would be larger variations in advertising levels and consumption data and a greater probability of seeing a positive relationship between advertising and consumption. The results in these studies are very much dependent on the type of data used, since aggregate annual data have too little variance and show little or no relationship to consumption (46). On the other hand, studies using cross-sectional data show a large and significant relationship with consumption.

Counter-advertising studies have been plagued by the same aggregate data problems, since the level of counter-advertising is usually low and irregular over time. If it is measured over a wide enough range, it is more likely that a negative relationship will be found between counter-advertising and consumption than has been found in the literature to date. In fact, in 1970, the cigarette companies themselves concluded that one dollar of counter-advertising had a bigger negative effect than the positive effect of three dollars of advertising (46).

Studies on advertising bans have shown mixed results regarding their effectiveness in reducing demand. In general, most studies suggest that partial bans are effective in the short run in reducing demand but have very little impact in the long run. However, when complete and extensive bans are introduced, coupled with anti-smoking publicity and strong health warnings, these seem to be effective in reducing demand more permanently (47). When countries take the more legislative approach to tobacco control, with comprehensive advertising restrictions, smoking declines more rapidly. However, econometric analyses have again been plagued by technical difficulties in examining advertising bans, which again leads to confusing results. For example, most studies examine the impact of restrictions on one or two media only, allowing for substitution towards other media and the development of new market approaches. To counteract this effect, comprehensive bans are required to significantly reduce media substitution effects and subsequently demand (1). Studies also need to control for offsetting increases in the use of other media to show that advertising bans are significant in reducing consumption. In a recent study of 22 OECD countries using data from 1970 to 1992, it was shown that comprehensive bans can reduce consumption by 6.3 percent while limited bans would have little or no effect (48). For countries that have instituted comprehensive bans (for example, Canada, Finland, Iraq, Italy, Iceland, Norway, Portugal, Singapore and Thailand), estimated per capita cigarette consumption has decreased by around 8 percent on average, while for countries without comprehensive bans (Argentina, Bangladesh, Brazil, Denmark, France, Germany, Greece, India, Indonesia, Ireland, Israel, Japan, United States, United Kingdom, Sweden, Netherlands, Nepal and Malaysia) the corresponding figure is 1 percent.

Non-economic studies such as survey research and experiments have been more conclusive on the relationship between advertising and smoking behavior and are a fruitful avenue for further research. The body of evidence from economic studies has been less conclusive than the

evidence on the relationship between cigarette prices and demand, but there is still room for econometric research to offer valuable insights into the effects of advertising.

Occasionally there have been restrictions on the content of advertisements—restrictions on the time of airing in broadcast media and so on. For example, a content analysis study that employed coding criteria to analyze whether advertising was designed to appeal to specific demographic groups used data from the National Health Interview Surveys and found that cigarette advertising targeted at women increased the smoking initiation rates of adolescent girls (46). Targeted advertising is used to create brand personalities that appeal to specific market segments; thus, for example, Virginia Slims users are portrayed via models as sassy, bold, slim and exuberantly independent. Use of these products connects the consumers' fantasies to these images. Limitations on advertising that are partial in terms of content, placement, or one or two media only are clearly ineffective.

It seems evident that given the amount of money spent on advertising and promotion, and given the fact that in most countries tobacco industries are either monopolies or oligopolies, with consumers who have notoriously strong brand loyalty, the industry is not merely trying to influence brand share. If this were indeed the case, tobacco companies around the world would not care about advertising restrictions. However, in an industry which needs to recruit new smokers every day to maintain its market (given that in the United States around 5 percent of smokers are lost annually to cessation or death), marketing activities are intent on promoting market expansion rather than brand sharing. The World Bank (1) has estimated that the number of children taking up smoking every day ranges from 14,000 to 15,000 in high income countries as a whole. For low- and middle-income countries, the estimated numbers range from 68,000 to 84,000 young people per day. This means that worldwide, there are between 82,000 and 99,000 young people starting to smoke every day, with a growing proportion being young girls, who are specifically targeted by the tobacco industry.

In the United States, the advertising-to-sales ratio for most industries is less than 4 percent, averaging around 2–3 percent, while for cigarettes, the advertising-to-sales ratio has hovered between 6.3 in 1980 and 5.9 in 1997 (46). With promotional spending added to advertising monies, the total is both high and increasing. While in many developed countries some segments of the market may appear mature, there are several growth markets available for multinational tobacco companies, particularly young people, women and men in developing countries. Substantial shares of advertising and promotional activities are being directed towards these potential growth markets. In a survey of Europe, Asia and the Middle East, tobacco companies were listed among the top 10 advertisers in 21 out of 50 countries (46).

One suggestion to restrict tobacco advertising has been to tax advertising, as the demand for advertising is price-responsive (46). In order to prevent media substitution, the tax would have to be applied equally to all media, while it could raise tax revenue which could be used to fund counter-advertising. The tax could either be applied directly on tobacco advertising or applied indirectly by eliminating the tax deductibility of advertising.

Health information. Econometric analyses on the release of health information about smoking or "health scares" have been found to significantly reduce consumption and have an immediate impact, with the negative impact eventually diminishing over time. Limited econometric evidence on health warnings on cigarette packs has also been shown to have a small but significant effect on reducing consumption (2).

In several countries, portions of tobacco taxes are earmarked for health education to reduce smoking, including several US states (California, Massachusetts, Arizona and Oregon). Given that many women do not have full knowledge of the health consequences of tobacco use, particularly in developing countries, this may form an important aspect of tobacco control policy.

Access and clean air. Clean indoor air laws and youth access restrictions are an important component of a comprehensive tobacco control policy. Restrictions on smoking protect the health of nonsmokers through reductions in their exposure to ETS and help smokers to quit by reducing their smoking opportunities (49). They induce smokers to carry the full cost of smoking and therefore reinforce social norms of the undesirability of smoking.

Minors use commercial sources (such as convenience stores, gas stations, and vending machines) and social sources (parents, other adults, peers, and strangers) to acquire tobacco products. Youth access laws restrict the availability of tobacco products from commercial sources and minors'access to them. While controlling social sources of tobacco is more difficult, as it conflicts with the autonomy of adults, reducing commercial availability can be framed in terms of protecting young children. Such laws include instituting minimum legal purchase-age laws, limiting the placement of vending

machines to adult locations, banning the sale of loose cigarettes, and outlawing the distribution of free samples to minors. Regulating sellers through licensing requirements, with strict penalties for violating minimum age-at-sale laws, would also be included in a workable set of policies to restrict youth access to tobacco.

Many countries do ban the sale of cigarettes to minors, which establishes a minimum legal purchase age for cigarettes (50). A few econometric studies have examined the effects of these legal restrictions on youth smoking and have generally found that they have little or no impact. This has been attributed to the lack of enforcement of such laws. More recent studies have shown that where such restrictions are aggressively and comprehensively enforced, they have a significant effect on youth smoking (1). Thus, the law itself is not expected to have an effect, but its enforcement is. Compliance measures or checks coupled with higher retailer compliance have been found to lead to reductions in youth smoking (49).

As commercial sources of tobacco become more limited, noncommercial sources will be used more (other youth, peers, parents, strangers), and this poses an even greater challenge. It will require broader community interventions that seek to change social norms to discourage smoking behavior. This would help to reinforce legislative and regulatory efforts.

Many governments have also increasingly applied restrictions on smoking in certain locations, given increasing evidence as to the detrimental effects of ETS. These generally apply restrictions to smoking in public places and on public transportation. Since this raises the cost of smoking for smokers, it not only protects nonsmokers but also contributes towards reducing smoking, as smokers have fewer opportunities to smoke and it makes smoking less socially acceptable. There is ample evidence that restrictions in public places and private workplaces reduce smoking prevalence and actual consumption. Again, cross-sectional data produce better econometric results. Models suggest that as clean indoor air laws become more restrictive and comprehensive, consumption will decrease. Studies from the United States suggest that workplace bans reduce prevalence by 4–6 percent and consumption among smokers by 10 percent. Smoke-free ordinances have been shown not to affect restaurant and bar revenues, nor have they resulted in job losses in the restaurant industry or reduce the number of restaurants (49).

In conclusion, a comprehensive package of non-price measures in conjunction with price measures would be the best way to address smoking among both men and women. Access laws and other nonprice measures are also extremely important tools in preventing young children from becoming smokers, and should therefore form part of a holistic and comprehensive tobacco control strategy.

The costs and consequences of tobacco control policies

Given the evidence presented in this paper on the health consequences of tobacco use and the future toll it may impose on health care systems worldwide, governments may want to consider whether tobacco control measures that have been discussed in this paper (namely taxation and other non-price measures) are worth paying for. Because many governments have limited resources with which to produce health benefits, tradeoffs must be made in terms of which health care interventions are more cost-effective and beneficial. This can be evaluated by estimating the expected gain in years of healthy life that each intervention will achieve in return for the public cost required to implement the intervention. Tobacco control policies are indeed a very cost-effective and worthy inclusion in a minimum package of health care programs, and the cost is around $20–$80 per discounted year of healthy life saved (disability-adjusted life year) (51).

TABLE 3: THE COST-EFFECTIVENESS OF TOBACCO CONTROL MEASURES

	PRICE INCREASE OF 10 PERCENT	NON-PRICE MEASURES WITH EFFECTIVENESS OF 5 PERCENT	NRT (PUBLICLY PROVIDED) WITH 25 PERCENT COVERAGE
Low/middle income	4 to 17	68 to 272	276 to 297
High income	161 to 645	1347 to 5388	746 to 1160

Source:[52]

Table 3 shows estimates of the cost-effectiveness of a basic package of tobacco control interventions in US dollars per disability-adjusted life year saved. These include a tax increase, a package of non-price measures including a ban on tobacco advertising and promotion, and drug costs for nicotine replacement therapy (NRT). Implementing a tax increase is shown to be extremely cost-effective, particularly in low- and middle-income countries. The cost is comparable to that of health interventions such as child immunization. Non-price measures have a cost-effectiveness comparable to that of the integrated management of a sick child in low and

middle income countries. Liberalizing access to NRT will be extremely cost-effective, but directly meeting the costs of NRT with public funds may have to be assessed with caution in each individual country. As the number of adults wishing to quit smoking grows, the cost-effectiveness of NRT will also grow.

Therefore, even in countries where public health care expenditure is extremely low, a basic package of tobacco control measures can be an extremely affordable and cost-effective investment in health.

SUPPLY-SIDE POLICY RESPONSES

Most of the literature has focused on issues pertaining to the demand for tobacco and policies relating to reducing the demand for tobacco, as it is generally believed that such policies are more effective than trying to reduce the supply of tobacco. However, it is important to understand supply-side responses, as they are an essential ingredient in the policy debate. The benefits of the tobacco business—employment, tax revenues, and profits—must be traded off against the reduced duration and quality of life for the users of tobacco. The main supply-side concerns relate to whether increased taxes induce more smuggling, whether increased taxes (and other tobacco control policies) create more unemployment and harm the macro-economy, and what sort of agricultural policies should be put in place for tobacco farmers who depend on the crop.

The threat of smuggling

Around 30 percent of internationally exported cigarettes are lost to smuggling (1), and although the problem is acute, it has often been overstated (28). Both large tobacco-tax increases by countries and significant price increases initiated by the tobacco industry have occurred in several countries without dramatic increases in smuggling. Several other reasons, such as lack of enforcement and a general culture of corruption, may be more important in contributing to the likelihood of smuggling taking place than differences in tax rates. Many countries with high prices, such as France, Norway, the United Kingdom and Sweden, show very little evidence of smuggling, while several low price countries such as Spain and Italy have evidence of extensive smuggling.

The share of cigarette taxes in cigarette prices varies considerably across countries, from over 80 percent in some countries that have been successful in tobacco control efforts to less than 30 percent in many developing countries. Large differences in taxes lead to large differences in price among these countries and can fuel black market activities and smuggling behavior. Differences in cigarette taxes and prices potentially create casual and organized smuggling and other forms of tax evasion. The tobacco industry argues that cigarette tax increases can erode valuable tax revenues, as a result of smuggling, while not reducing consumption. Consequently, Canada and Sweden both reduced tobacco taxes in recent years because of the perception that smuggling led to lost cigarette tax revenues. The United States and other countries also have not increased tobacco taxes partly out of fear of the development of a black market, given differences in tax rates across neighboring countries (2).

The complicity of the tobacco industry in smuggling should also be recognized when considering the credibility of their call for reducing taxes to prevent smuggling. The tobacco industry will be a clear beneficiary of smuggling: when smuggled cigarettes account for a high proportion of the total sold, the average price of all cigarettes, taxed and untaxed, will fall, increasing sales of cigarettes overall. The presence of smuggled cigarettes also influences governments toward keeping tax rates low.

The smuggling problem is exacerbated by the ease with which tobacco products can be transported, the huge potential profits, the informal distribution networks in many countries, the availability of tax-free and duty-free cigarettes, and the lack of enforcement in many countries (53). Most smuggled cigarettes are well-known international brands smuggled somewhere in transit between the country of origin and the country of destination, reappearing in the country of origin at cut-rate prices, untaxed.

> The WHO Framework Convention on Tobacco Control will include protocols with specific obligations for countries to address smuggling and taxation and pricing.

There are several easy-to-implement policies, including stronger enforcement, use of tax stamps, and greater penalties for smugglers, that could significantly reduce the problem (54). Tax stamps—which must be difficult to forge—used on duty paid packs can help enforcers to ensure the legality of packs. Special packaging for duty-free packs would also help. In addition, all parties in the supply chain could be licensed, as they are in

France and Singapore, for example. Manufacturers could be forced to use serial numbers on each pack to facilitate tracking, while pack-marking technology could provide further information about each link in the supply chain, such as the distributor, wholesaler and exporter. Manufacturers could be required to keep better records regarding the final destination of their products. Computerized control systems would enable the tracking of individual consignments and their progress at any point in time, as is in place in Hong Kong. Exporters could be required to label packs with the country of final destination and a health warning in the language of that country (1).

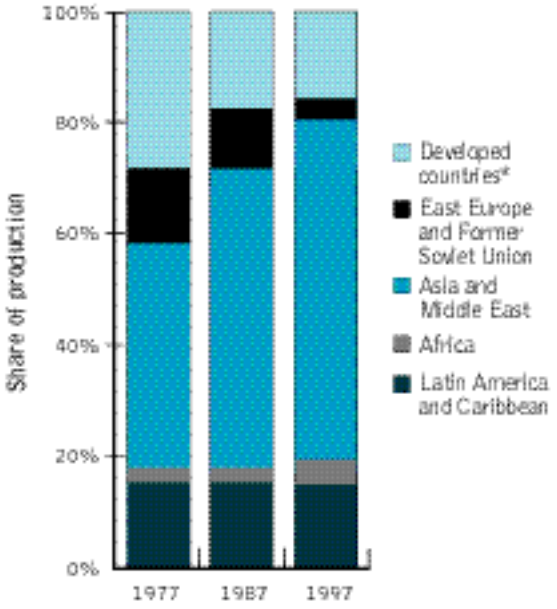
The threat of smuggling may also call for regional coordination in successfully applying tobacco tax policies across countries. Multilateral agreements that took relative tax structures into account could be valuable in applying consistent tobacco control policies across regions. For example, the WHO Framework Convention on Tobacco Control will include protocols with specific obligations for countries to address smuggling and taxation and pricing, since strong national measures taken in a single country can be undone if transnational dimensions such as smuggling are not addressed.

Agricultural policy and the macroeconomic effects of tobacco control policies

An estimated 33 million people are engaged in tobacco farming worldwide; some 15 million of them are in China. Most of these people are small farmers who grow other crops in conjunction with tobacco. Tobacco manufacturing, on the other hand, is highly mechanized, and in most countries it accounts for less than 1 percent of total manufacturing employment. On the whole, tobacco production is a small part of most economies.

One of the main concerns often raised by the tobacco industry and the general public is whether tobacco control policies (such as increased taxation on cigarettes or advertising bans), which in effect reduce consumption and demand, would create a sudden mass increase in unemployment and negatively impact the economy. Several studies have been commissioned by the tobacco industry to produce estimates of their contribution to employment, incomes, and tax revenue in order to convince legislators that tobacco control policies will harm the broader economy and cause widespread job loss (55–65). These studies have been criticized because they calculate the gross contribution of tobacco to employment, tax revenue, and the economy. They do not take into account the fact that if people stop spending money on tobacco they will usually spend it on other things, thus generating alternative jobs to compensate.

FIGURE 5: SHARES OF WORLD TOBACCO PRODUCTION, BY REGION



Source: (30)
Note: Developed countries* include North America, Western Europe and Japan

However, several independent studies examining the overall net effect of tobacco control policies on various economies mostly show a very minimal but usually positive effect in the long run (66–75). These studies take into account the compensating effect of alternative jobs that would be generated by money not spent on tobacco (76).

The independent studies show that in the overwhelming majority of countries and in the medium and long run, even very stringent tobacco control policies will have minimal negative impact on long-run Gross National Product, employment, tax revenue and foreign trade balances, as expenditure switches and reallocations in the economy take place. A country's reliance on tobacco exports and its stage of development influence its view of and openness to tobacco control measures, as in general a few large tobacco-producing and -exporting countries stand to lose more than the majority of countries which are net importers and consumers of tobacco (35). The impact of a fall in consumption will vary depending on the type of economy. The small handful

of net exporting economies that are heavily dependent on tobacco for foreign exchange earnings—such as Zimbabwe and Malawi, for example—could experience net national job losses. However, even these agrarian economies that are dependent on tobacco production and exports will have a large enough market to ensure jobs for many years to come, even in the face of gradually declining demand. The majority of countries, though, produces and consumes or fully imports tobacco; for those countries, much of the impact of tobacco control is borne by the consumer, and it is likely that more jobs will be created than lost.

If, however, there were a sudden and sharp reduction in tobacco production (which is not likely, since global demand for tobacco is set to increase), it is highly unlikely that supply-side policies designed to restrict tobacco production would be practicable for the majority of countries. Policy-makers are often concerned about how they should implement the transition in agriculture toward reduced dependency on tobacco crops. Concerns over farmer subsidies or price-support measures are often highlighted by the public health community. Similarly, calls are made for policy-makers to encourage substitution from tobacco to alternative crops, or even to buy out tobacco producers altogether. In many high-income countries, tobacco farmers have been making economic adjustments for decades as a result of declining world tobacco prices, and many farms are already very diversified. However, governments may want to provide assistance in meeting transition costs for poorer farmers. These costs are increasingly becoming a problem in developing countries, as shown in Figure 5. Farms represent an important source of rural employment, and appropriate interventions should consider broad rural development programs, assistance with crop diversification, rural training, and broader off-farm employment opportunities. This support could be financed by tobacco taxes earmarked for such purposes.

The overwhelming evidence suggests that the best approach is to emphasize measures that act to reduce demand, leaving supply to adjust to evolving changes in demand.

Supply-side policies—crop diversification, subsidies, price supports and other strategies such as buy-outs—have had a very limited effect in significantly reducing the supply of tobacco. These policies may work in particular countries or with particular farmers in appropriate settings, and are therefore important to understand, but they will not have a meaningful effect on the overall supply of tobacco as long as global demand continues to increase.

Ultimately, supply-side policies are of limited value. The best way to reduce supply is to reduce demand. As long as demand grows, buy-outs, price supports, subsidies and alternative crop programs will have minimal effect, since they will merely produce opportunities and profits for future producers of tobacco (30).

CONCLUSIONS AND FUTURE RESEARCH NEEDS

Economic analysis has made valuable contributions to research on tobacco control based on objective data and increasingly sophisticated knowledge. Particularly with respect to price and taxation policy, economic analyses have had the most influence and made the most contribution to guiding policy formulation. Economic research has also offered important insights regarding the effects of advertising and promotion on demand, restrictions on advertising, access, and smoking in public places, counter-advertising, and the dissemination of health information. In some of these subject areas, however, economic approaches have been less helpful in answering certain questions. This reflects in part the limitations of econometric methods and the inadequacy of some data.

Evidence presented in this chapter suggests that comprehensive measures for promoting smoking cessation among women and girls and reducing the prevalence of smoking include instituting higher tobacco taxes, enforcing minors'access laws, restricting smoking in public places, banning tobacco advertising and promotion, using counter-advertising, and disseminating health education and information on the health consequences of tobacco. Tobacco tax increases will be far more effective if they are employed in conjunction with a comprehensive package of prevention and control policies, given that women experience a complex set of environmental and social pressures that make it hard for them to quit. Therefore, although taxation is the most potent and tractable policy tool, a package of price and non-price policy measures will be most effective in influencing women's smoking behavior.

Because taxation is essentially a blunt instrument, price increases will reduce smoking prevalence and consumption, especially among young people, but many adult smokers will continue to smoke and pay the higher prices. Cessation programs should therefore be made available to benefit those who continue to smoke and pay a greater share of the increased prices. Nicotine replacement therapy and other cessation services could be made available to women who struggle to quit through earmarked tobacco taxes.

Higher taxes are the most potent available tool with which to balance young people's inadequate perceptions about the addictive nature of tobacco and their myopic behavior in discounting the future health consequences of their consumption. Youth are also strongly targeted by billion-dollar advertising and promotion campaigns. Given their relative elastic demand for tobacco, the benefits from a tax increase would be substantially larger than the losses incurred by adult smokers, because of the mortality and morbidity that will be prevented in the long run.

Very little economic analysis has been conducted on population subgroups and on women in particular. It is imperative that further studies be carried out using individual level data to examine the differential impact of pricing on gender—especially in developing countries, where young women are being particularly targeted by the tobacco industry as a growth market. Such surveys need to include data not only on consumption but also on price, availability, advertising, counter-advertising, smoking policies and other important macro-level determinants of demand that are often not collected in such surveys. This would help researchers to avoid problems of potential bias through the omission of important relevant variables in analyses.

Survey data and epidemiologic data for tracking tobacco trends in women and children should be collected and linked through economic studies to examine the health impact of tobacco control policies on these population groups. The ultimate aim of tobacco control policies is to reduce tobacco-related mortality and morbidity, and understanding how specific policies can contribute to this end will be extremely powerful.

Objections to increased taxes and other tobacco control policies on the supply side are mostly based on misconceptions and should not be used as arguments to dissuade governments from raising taxes. These include threats of smuggling, the fact that tobacco taxes place a disproportionate burden on the poor, the fact that higher taxes will lead to reductions in revenue, and the possibility that tax increases will lead to falls in employment and macro-economic vitality. There is little evidence to support many of these claims, and the threat of not doing anything to prevent the tobacco epidemic spreading to women and children is far greater than any of these concerns.

RECOMMENDATIONS

- Governments should raise tax rates to levels close to those of countries that have been more successful in tobacco control, with tax rates being around two-thirds to three-fourths of the price of cigarettes.
- Governments should implement a comprehensive package of non-price measures together with tax increases that include a comprehensive ban on all forms of advertising and promotion, the use of counter-advertising, strict enforcement of access laws for minors, dissemination of health information regarding the consequences of tobacco use, health educatio, and the passage of clean-air legislation.
- More research should be conducted on the differential impact of tobacco control policies and the health consequences of such policies on youth, adolescents, ethnic minorities and women, particularly in developing countries, given that the burden of the tobacco epidemic is shifting to these populations.

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Strengthening International Agreements

Charlotte C. Abaka

The world is faced with a rising but totally preventable public health disaster. According to the World Health Organization's *World Health Report* of 1998 (1), the number of women, particularly young women, who smoke is increasing. In addition, involuntary exposure worldwide to tobacco smoke is also a great concern for women and children in many countries. This other avoidable exposure comes mainly from the smoking of men at home and in public places and workplaces.

The trend of rising active smoking among women has social and economic consequences for national welfare in virtually every country in the world. Tobacco-related diseases add yet another health burden to countries in which women's access to healthcare is already restricted. In many developing countries, severe economic difficulties coupled with structural adjustment and political transitions have led to privatization of health and other social services. In Africa, the Middle East and Eastern Europe, ethnic conflicts, civil wars and uprisings have further disrupted health and social support for women and children. These countries are not prepared to deal with the costs, both financial and nonfinancial, of epidemic tobacco-caused disease.

Urgent action involving all nations is needed to curb the rising epidemic of tobacco use among women and youth. The transnationalization of the tobacco industry, with its promotion and marketing, is creating a global public health threat. Advertising that targets women and youth is a transboundary problem that requires an international strategy and intergovernmental cooperation. The evidence indicates that governments should show strong support for the World Health Organization initiative on the Framework Convention on Tobacco Control (FCTC) (2). Already in the process of intergovernmental negotiations, this accord promises to address important issues of concern to women including smuggling, access to cessation methods, taxation and tobacco use among children. Such a global treaty is not only timely, it is one of the most important political tools currently available to public health today.

The purpose of this chapter is to examine how this new treaty relates to other important international agreements concerning women's human rights. In particular, the issue of women, tobacco, and the FCTC will be examined in the context of the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (3). Trends in Africa are also addressed.

In developing a gender-sensitive strategy for the FCTC, the international community should build on existing policy documents, legislative instruments, and international initiatives. The world women's conferences in l975, l980, and l985 provide excellent policy documents. The concept of women's health as a human right has been promoted by the recent series of United Nations (UN) world conferences, all providing solid foundations to support the FCTC (2). Among these, the most recent were the Conference on Human Rights held in Vienna (1993), the International Conference on Population and Development in Cairo (1994), and the Fourth World Women's Conference held in Beijing (1995). The Beijing women's conference specifically identified tobacco as a women's health issue and called upon governments to take action.

Such policy documents, however, are not legally binding, and institutional or individual discretion may determine their implementation. The most important international legally binding document for the human rights of women is CEDAW (3), ratified by more than 163 countries. Only the State Parties that have signed on to international conventions like CEDAW are legally required to uphold the agreements. An FCTC with a gender perspective would provide additional strength.

History of UN Agreements on Human Rights and the Convention on the Elimination of All Forms of Discrimination Against Women

To understand fully the importance of the CEDAW and its relation to the FCTC, it is necessary to examine the context of its evolution. The majority of human rights agreements come from negotiations under the auspices of the UN. They are usually initiated as a result of global concern about specific issues or about global tragedies such as World War II. Thus, in 1948, the United Nations proclaimed a Universal Declaration of Human Rights that clearly describes the "inalienable and inviolable rights of all members of the human family" (4). This declaration marked a moral milestone in the history of the community of nations. However, because a declaration lacks the force of law, the principles of the Universal Declaration of Human Rights had to be transformed into treaties, covenants or conventions to make them legally binding on the countries that ratified them.

Following the Universal Declaration of Human Rights, there were two crucial legal instruments: the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights. These two legal instruments together with the original Universal Declaration of Human Rights comprise what is known as the International Bill of Human Rights. Subsequent conventions have elaborated on the International Bill of Human Rights by focusing in greater detail on specific human rights areas.

The 1960s saw an emergence in many parts of the world of a new awareness of the patterns of discrimination against women and a rise in the number of organizations committed to combating the effects of such discrimination. The human rights treaties established a comprehensive set of rights to which all persons are entitled. However, over the years, these proved insufficient to guarantee women the enjoyment of their internationally agreed-upon rights.

For these reasons, the UN General Assembly adopted a resolution in 1963 in which the Commission on the Status of Women was requested to prepare a draft declaration combining in a single instrument the international standards that articulated the equal rights of men and women. Four years later, the Declaration on Elimination of Discrimination was adopted by the General Assembly.

In 1972, five years after the adoption of the Declaration, the Commission on the Status of Women considered preparing a binding document that would give normative force to the provisions of the Declaration. Finally, in 1979, the CEDAW (3) was adopted. On September 3, 1981, just 30 days after the 20th State Party had ratified it, the Convention entered into force, bringing to a climax UN efforts to codify international legal standards for women.

The CEDAW, which celebrated its 20th anniversary in 1999, has been ratified by 163 State Parties.

Often described as an international bill of rights for women, the convention was the first international document to embody the concept that rights are basic values shared by every human regardless of sex, race, religion, culture or age. The CEDAW (3), which celebrated its 20th anniversary in 1999, has been ratified by 163 State Parties. It is unique among existing human rights instruments, because it is exclusively concerned with promoting and protecting women's human rights in a wide range of areas and because it operates from the premise that patriarchy is a global reality. It is based on the reality of deep-rooted and multifaceted gender inequality, which exists worldwide. It also emphasizes both public- and private-sphere relations and rights and specifically underlines the almost universal difference between de jure and de facto equality of women in the world. The Convention focuses on elements of the social traditions, customs and cultural practices that restrict the practice by women of their rights in many societies. These are identified as factors that help perpetuate de facto inequality. Consequently, the Convention is very specific about certain social and cultural forces, such as traditions and religions that "legitimately" violate women's human rights. Likewise, the Convention is clear about State Parties'use of such economic conditions and factors as structural adjustment policies and programs, slow economic growth rates, recessionary pressures and privatization to justify discriminatory practices against women. The CEDAW also operates with the understanding that the State's failure to remove obstacles to women's enjoyment of all their rights is also discriminatory. This means that the Convention has an expanded conception of rights and holds State Parties accountable for failure to act and for abuse of power by private parties.

One of the rights guaranteed under the Convention is the right to equality in the full enjoyment of health. Article 12 of the Convention requires State Parties to eliminate discrimination against women in all aspects of their health care including drug addiction and related problems. Although tobacco is not specifically mentioned, it is covered by Article 12 and has been interpreted by the CEDAW Committee as an issue on which governments can be held accountable. Since 1995 the CEDAW Committee has increased its efforts to hold governments accountable for accurate reporting on women and tobacco and compliance to this provision.

A main assumption of CEDAW is that the maintenance of health affects the very existence of human beings and is a fundamental need that forms the basis for securing human rights. World Health Organization studies indicate that more than 20 million lives could be saved by the provision of necessary medicines, pharmaceuticals, health care education and facilitation of improved lifestyles (1). These can all be included under Article 12 as part of women's rights to health.

The CEDAW Committee also notes that women's health should have a high priority because women are the providers of health care to their families, and their role in health care, including childbirth and child rearing, is of great significance to successful development. The CEDAW Committee has worked within a framework in which health care is directly concerned with issues such as population growth, development and the environment. If malnutrition and poverty are to be overcome, the promotion of health and education and the advancement of women's status must be considered as cardinal elements. In viewing the enjoyment by women of health as an intrinsic human right, State Parties are obliged to address the conditions that lead to poor health as well as women's health status.

The issue of a human rights approach to women's health is not limited to Article 12 of CEDAW (3). For example, Article 7 of the Convention gives women the right to participate in public life and political decision-making. The effective implementation of this right would mean involving women in designing and implementing national health policies and programs. Article 2 notes that States must propose a policy to guarantee women the exercise and enjoyment of human rights and fundamental freedoms, covering both private as well as public sectors. This means that women must be fully informed about their rights, a provision that can be applied to tobacco control legislation. Article 11.1 refers to the right of women to the protection of health and safety in working conditions, a provision that is directly relevant to passive smoke hazards. Another example is the application of the right to life. Through implementation of special proactive measures, maternal health must be protected.

In addition to the existing articles, the CEDAW Committee has the power of General Recommendations that interpret and update the articles. According to General Recommendation 24, governments have a duty to report to CEDAW on health legislation plans, policies with reliable data disaggregated by sex on the incidence of the severity of conditions hazardous to women's health, and cost-effective preventive measures. All should be based on ethical and scientific research. State Parties must make appropriate budgetary provisions to ensure that women realize their rights to health care. The implication is that, if governments do not provide these rights in relation to women and tobacco, they will not have fulfilled their obligations under the convention. The general recommendation also outlines the need for States to cover women's health throughout their life cycle (1).

In addition to Article 12 and other related articles of CEDAW, the following international agreements are also explicit on the issue of women's health:

- The International Covenant on Economic, Social and Cultural Rights (Article 12:2a) (5)
- The Convention on the Rights of the Child (Article 24: 1d, 1f) (6)
- The Beijing Platform for Action (Articles 89 and 106) (7)
- The UN Declaration on Violence against Women (Article 3f) (8)

As already noted, when a country becomes a State Party, it accepts a legal obligation to eliminate discrimination against women. To monitor the CEDAW treaty, the United Nations established an independent body of 23 experts in l982 as the UN Committee on the Elimination of Discrimination against Women (CEDAW Committee). This body uses information on State Parties'reports under review from all UN agencies and bodies, as well as from nongovernmental organizations, to monitor the fulfilment of State Party obligations.

The Committee meetings are held twice annually when national reports submitted by State Parties are reviewed. These reports are to be submitted within one year of ratification or accession and thereafter every

four years. Government representatives present these reports, which cover national action taken to improve the situation of women, to the Committee. In discussions with the representatives, CEDAW experts can comment on the report and obtain additional information. This procedure of dialogue developed by the Committee has proven valuable because it allows for an exchange of views and a clearer analysis of antidiscrimination policies in the various countries.

The Committee also makes recommendations on any women's issue to which State Parties should devote more attention. For example, at the 1999 session, the Committee discussed the high incidence of tobacco use among young women and requested information on this issue.

When a State Party agrees to CEDAW and adopts a policy document, the combination can be very powerful, and CEDAW can be combined effectively with such policy documents as well as new treaties. This is because CEDAW and some policy documents are mutually reinforcing. Most of the issues in the Twelve Critical Areas of Concern (1), such as women's health, in the Beijing Platform for Action (7), are also included in CEDAW. For example, in paragraph 232, the Platform makes the CEDAW Committee one of the implementation monitors of the Beijing Platform for Action. A government or State Party such as Ghana that ratified CEDAW without reservation and also signed onto the Beijing Platform for Action is doubly committed, first at the policy level and second according to international law.

Although the CEDAW Committee gives precedence to State Parties, it must also address the issues critical to the Beijing Platform for Action. In so doing, CEDAW is useful for the implementation of the Beijing Platform for Action. Another reason to combine the two is because of areas where the Beijing Platform for Action is more extensive. When CEDAW was drafted, the issue of women and tobacco was not recognized. Similarly, the issue of violence against women was not as visible as it is today. The above policy and treaty agreements can be brought to bear on strengthening the FCTC with regard to these emerging health issues.

In 1996, the Convention adopted a suggestion (number 7) proposing elements for a petition and an investigation procedure for complaints. Then, at the 43rd session of the Commission on the Status of Women, delegates adopted an Optional Protocol to CEDAW, which entered into force in 2000.

It is important to recognize the strategic importance of nongovernmental organizations with regard to monitoring. At a time when the increasing power and influence of transnational corporations in political and economic decision-making threaten to overshadow those of individual nations, particularly developing countries, nongovernmental organizations can play a crucial role, working in conjunction with national and intergovernmental bodies. The greater the role of nongovernmental organizations throughout the entire process, the stronger the final outcome. Nongovernmental organizations can also provide technical expertise on issues and on working with the media. Nongovernmental organizations have the ability, together with the media, to build public support for the proposed FCTC.

Women leaders and nongovernmental organizations have played a critical role in promoting the establishment and drafting of conventions and international policy documents to protect human and environmental health and safety, among others, in the past two decades. Women's groups, nongovernmental organizations, UN agencies, and UN bodies have helped to strengthen the visibility of the CEDAW Convention and the Convention on the Rights of the Child.

During the 1993 World Conference on Human Rights in Vienna, nongovernmental organizations were also very instrumental in promoting the concept, "women's rights are human rights." At the CEDAW proceedings, nongovernmental organizations had a critical role in helping to monitor implementation through the submission of "shadow reports" based on alternative sources and analyses of national data. (It is important to mention that, although CEDAW is one of the most widely ratified conventions, with 163 State Parties as of March 1999, it also has the highest number of reservations. Removal of these reservations is a major goal for both nongovernmental organizations and governments in the coming years.)

All these experiences can be applied to strengthen a tobacco convention, but what can such a treaty accomplish? Like other international agreements, the FCTC and its provisions concerning women can be used to commit governments for more gender-sensitive policies and legislation. The FCTC will hold governments accountable for commitments made in ratifying or acceding to the FCTC, provide a legal basis for interpretation of or amendments to existing national laws, and assist in the enactment of new legislation regarding women's health related to tobacco. The FCTC can also create an expanded human rights framework for women

that is acceptable within their own culture or under their own legal system. This includes women's rights to a safe and smoke-free environment in public places and in the home.

A strong FCTC will provide access to a large human rights community, including legal recourse and advocacy groups, and to international legal bodies with a related review and compliance procedure. It will also establish the legal parameters and structures of a public health tool for women in dealing with tobacco control and clarify that tobacco is a contributor to inequality in all societies.

EMERGING TRENDS

The urgent need for a tobacco treaty that addresses women's and tobacco issues is illustrated by the situation in Africa. Multinational tobacco companies are now searching for new markets in developing countries. Tobacco companies aggressively promote cigarette smoking, especially to women from lower socioeconomic levels. Currently, in the developing world where smoking has been associated with a cosmopolitan and affluent lifestyle and with emancipation, many young women who aspire to this lifestyle have taken up smoking. There is serious concern, particularly among parents, that these aspirations will result in increased prevalence of tobacco use among women.

The World Health Organization publication, *Women and Tobacco* (9), indicates that in Africa, the current estimated prevalence of women who smoke is 10 percent and that the rate is increasing, especially in urban areas. In rural areas, purchasing power is limited and is a contributing factor to the lower rates of smoking. Tobacco chewing, however, is not uncommon among women in the rural areas. According to Elegbeleye and Femi-Pearse in their 1976 publication (10), less than 3 percent of Nigerian female students smoked tobacco.

At a regional seminar of selected English-speaking countries in Lusaka, Zambia in June 1984, it was reported that, among students in secondary and tertiary educational institutions in Zambia, 4 percent of women were tobacco smokers and, in the general population, 7-10 percent of women were daily smokers (11). However, only a few African countries have conducted surveys of smoking among the general population, and the few surveys reported tend to focus on specific groups, such as students.

At the same seminar, the report from Ghana on the topic of smoking and health issues (12) mentioned that, in the early 1980s, 0.75-5.9 percent of women in Ghana smoked. Fortunately, the prevalence of tobacco use in Ghana is relatively low. Nonetheless, the incidence poses a serious threat to the individual, parents, community, and nation because the habit is spreading among youth. A recent survey of schools in the Ashanti and Greater Accra regions (the most developed regions in Ghana) revealed that about 5 percent of the pupils smoke; 4.88 percent are male and 0.2 percent are female. The majority had started smoking around the age of 14 years. The Ghanaian National Committee has conducted surveys in specific schools as a pilot project and has found that many underaged people and pupils have started smoking. An urgent need exists to launch an educational campaign against the practice, including disseminating the disadvantages of smoking. Fortunately, many nongovernmental organizations in Ghana could be involved in the anti-tobacco campaign.

To combat the rising epidemic of tobacco use, the FCTC and women's leadership need to design campaigns that have an impact. At the national level, Ghana provides an example whereby the issue of women and tobacco as a public health issue has not yet been emphasized. This is particularly important because Ghana is a substantial consumer of tobacco. It imports tobacco from various countries and also manufactures cigarettes. Revenues earned from taxes on tobacco are also substantial.

In Ghana, the National Tobacco Control Committee lies within the Ministry of Health (12). The main objective of this national body is to devise strategies to curb smoking. The Committee has been in existence for many years, and it is notable that the Committee's activities are now becoming more visible. On World No Tobacco Day in 1999, it organized a series of talks on television and radio about the dangers of smoking. The Committee also published an article in a widely circulated national newspaper about the health consequences of tobacco. The National Tobacco Control Committee was involved in adopting a policy that forbids advertising in print and electronic media as well as smoking in public places and on national airlines. The policy also requires tobacco companies to post health warnings on their products. In most instances, implementation is the rule.

In Ghana, the issue that is often raised is individual rights and freedom of choice. The argument often centers on individual responsibility for health. However, anti-tobacco advocates make a strong counterargument that where one's freedom ends the other person's begins and that we all breathe the same air.

Serious consideration must be given to the plight of innocent passive smokers, unhealthy babies born to mothers who smoke, and children who fall victim to tobacco-related diseases. The human rights of the victims are violated because they are not given the opportunity to be responsible for their own health and equal access to cessation programs.

Aggressive advertising through billboards and other media is increasing. Marketing strategies link cigarettes with alcoholic beverages, and the messages used are particularly effective among youth. An aspect of globalization in Africa, including Ghana, is that the youth consider whatever happens in the Western world, particularly in America, as modern. Parents are concerned about this view, and many believe that this is contributing to the moral degradation of youth. It is now not uncommon to see young people, including females, openly smoking.

Many Ghanaian citizens and nongovernmental organizations, including the National Council on Women and Development, protested a tobacco company's sponsorship of national beauty and dancing competitions and other forms of entertainment. The tobacco control policies, however, are contested in the name of the free market system and trade liberalization.

The government of Ghana, as in many other African nations, earns revenue from the tobacco industry. However, it is estimated that the cost of low productivity coupled with the cost of treating tobacco-related chronic diseases outweighs the economic gains arising from taxes on tobacco products. The World Bank estimates that tobacco products cause an economic loss of billions per annum globally (13).

It will be difficult to estimate the number of tobacco-related deaths in rural areas at the present level of development. Certainly many cases do not seek medical attention and therefore cannot be incorporated in any statistics of tobacco-related illnesses. From the examples cited and the level of tobacco consumption in Ghana, it is clear that the good intention of the government in adopting tobacco control policies is not effective. Policies do not have the force of law and therefore only set a moral standard. The FCTC would reinforce existing tobacco control policies and help strengthen the national legislation infrastructure.

The government of Ghana, like all governments, should recognize that the impact of tobacco smoking on the population, especially women and youth, is a serious health issue, a human rights issue, an economic issue and an environmental issue.

The government needs the political will to look beyond the immediate revenue that it receives in the form of taxes from the tobacco industry. The good health of the people is crucial for the overall development of the nation. Ghana must therefore consider developing policies on tobacco control into enforceable laws and put into place a mechanism for their implementation and monitoring.

CONCLUSIONS

As Dr Brundtland has noted, the world enters the 21st century with hope but also with uncertainty. In this year's *WHO World Health Report—Making a difference*, she states, "The Universal Declaration of Human rights—now a century old—is only a tantalizing promise for far too many of our fellow humans.. .We can make a difference" (14). Women's leadership in achieving health as a human right is essential.

To strengthen the role of women in global tobacco control, governments and the World Health Organization should link FCTC and CEDAW, which is the only UN convention specifically on women's rights throughout the life span. CEDAWhas almost achieved universal ratification, and there are numerous nongovernmental organizations around the world that focus on its implementation.

The World Health Organization's must intensify its advocacy role with national governments in Africa and widely disseminate the summary country profiles on tobacco control programs (15). The profile was designed as a response to a request by the World Health Assembly to monitor and report regularly on the progress and effectiveness of member States'tobacco control programs. Such information can be used to advocate strengthening government programs and to monitor the course of such activities. In monitoring and controlling the tobacco epidemic among women and youth (particularly girls), assessment of targeted group surveys should be carried out at regular intervals. Where the expertise is not available locally or the subject is not considered a priority, the possibility of obtaining information through other health surveys should be investigated. It is important in all cases that scientific accuracy is emphasized and that data collection is sex- and age -specific.

The World Health Organization's joint action program with the European Union, entitled *European Action on Tobacco for a Smoke-free Europe*, is laudable as an

example of UN cooperation with regional bodies. Since smoking is increasingly becoming a problem among women and youth in Africa, the World Health Organization may consider a similar joint action plan with the Organization of African Unity for a smoke-free Africa. Many States of the Organization of African Unity have embraced the concept and the principle that respect for human rights is an important ingredient for democratic governance. This principle is enshrined in the spirit of the African charter on human rights and peoples'rights.

The power of numbers is seen in the placing of the Convention strategy within the context of the women's movement. For a convention to be effective at the national and international levels, both the power of information in all its various forms and the power of numbers must be used. People must be conversant with the text of the convention and must use the media to raise public awareness and international support. Women have the right to life and therefore also the right to be fully informed about the health hazards of using tobacco products. It is only when men and women have equal access to and use of information that they can make informed choices and take control of their own lives and destiny.

RECOMMENDATIONS

National governments

National governments must ensure the following:

- National tobacco control committees must be established and, within the same framework, each committee must have a focal point that deals with women and tobacco.
- Nongovernmental organizations must be empowered and supported financially at all political and technical levels to develop the necessary advocacy skills to monitor and control the tobacco epidemic among women.
- Legislation must be enacted that includes all necessary measures to discourage women from using tobacco (such as a ban on tobacco advertising and on all other forms of promotion).
- National machineries for the advancement of women (where they exist) and nongovernmental organizations engaged in the field of women's empowerment (health, economic, human rights) must be involved at all stages of the tobacco control program.
- All monitoring and implementation bodies must be strengthened to enable effective coordination at international, national and community levels.
- The convention and all other documents and publications must be translated into languages that can easily be understood.
- World Health Organization resident representatives must collaborate with the national bodies working in the tobacco control initiative.

International strategies

Strategies internationally should include the following:

- The World Health Organization, all UN agencies and bodies, and international nongovernmental organizations must work together to make States aware that the principle of tobacco control is to sustain human resource development through improved public health.
- Similar to the National Tobacco Control Committee, an international committee of experts under the supervision of the World Health Organization should be established with the overall objective of ensuring that tobacco products are less harmful.
- Consistent with the policy of the World Bank, no financial incentives or legislative protection should be given to encourage tobacco production.
- Tobacco farmers and women in tobacco production should be helped to diversify to alternate crops.
- For the World Health Organization to comply with the World Health Assembly's request to assist countries in implementing tobacco control policies and to monitor closely the evolution of the global epidemic of tobacco-related diseases, a globally standardized approach must be adopted. There is the need now for an international legal instrument, a convention and for a women's protocol within that document.
- An expert body based on gender equality must be established with the specific mandate of monitoring the progress and/or difficulties in the implementation of the FCTC.
- Nongovernmental organizations must be encouraged to send inputs on State Parties'implementation of the FCTC to the expert body.
- The convention must allow for individual complaints or groups of individual complaints (optional protocol procedure).

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The International Women's Movement and Anti-Tobacco Campaigns

Mabel Bianco, Margaretha Haglund, Yayori Matsui and Nobuko Nakano

For more than two decades, the international women's movement has been mobilizing at the grassroots level and affecting the international political agenda. Among the issues it has brought successfully to the world's attention are violence against women, consumer and environmental justice, reproductive health and sexual rights, and human rights. Although nongovernmental organizations (NGOs) involved in the anti-tobacco movement were active in developing countries, they have often worked apart from the mainstream women's movements. In some instances, the high rates of tobacco use among members of the women's movement made anti-tobacco campaigns unpopular with this group. The degree to which successful, emancipated women smoked attests in part to the successful marketing of tobacco as a "liberating" product. It is also true that tobacco control programmes often failed to reach out to the women's movement. However, in recent years, the international women's movement has begun to join forces with the tobacco control movement. Therefore, it is now timely to take stock of the possibilities for future partnerships on this issue.

The following is an account of women's activism in two regions—Asia and the Pacific, and Latin America and the Caribbean—where women's leadership has made a significant contribution to women's health and development. Through an historical analysis and overview of the current situation, this chapter outlines the potential as well as existing social resources that promise to help prevent the rising epidemic of tobacco use among women.

A BRIEF HISTORY OF THE WOMEN'S INTERNATIONAL MOVEMENT

For several decades, women have taken strong leadership roles at the national and international levels of the women's movement throughout the world. An important influence on the international women's movement have been the United Nations world women's conferences that provided opportunities to build solidarity, share visions and articulate regional concerns (1). The First UN World Conference on Women was held in Mexico City in 1975, the same year that was designated as the International Women's Year. The Women's Tribune, comprised of about 2,000 women from NGOs of various countries, was held simultaneously with the UN conference. The majority of the participants came from the United States and Latin America, while Asian, African and grassroots women's groups were underrepresented. Asian women watched the heated confrontation between feminists from the industrialized "North" (Northern hemisphere) and the developing countries of the "South" (Southern hemisphere). Issues such as women's reproductive rights featured in debates on women and health, but otherwise health was low on the list of priorities. In 1980, the Second UN World Conference on Women was held in Copenhagen. African women were more visible because of geographical and historical ties between Europe and Africa. The North-South confrontation was less apparent but other political issues related to the Cold War dominated the agenda. Known as the most controversial of the women's global conferences, this one nevertheless succeeded in introducing the important Convention on the Elimination of All Forms of Discrimination Against Women or the women's bill of rights. In Article 12, women's rights to health were guaranteed.

The new strength of the Asian women's movement was reflected at the Third World Conference on Women in Nairobi in 1985. Unfortunately, women's health and the environment were not major issues at that event, although women's reproductive health was an increasingly important human rights issue, while other issues such as poverty and education were highlighted. In the aftermath of other UN confer-

ences, including one on environment and development, the Vienna Human Rights conference, and the International Conference on Population and Development, women's NGOs concerned with health and environment developed stronger lobbying strategies and political agendas. This momentum culminated with the Fourth World Conference on Women held in Beijing in 1995 when both environmental and women's health issues achieved an important consensus between North and South.

The Platform for Action—the blueprint for women's equality in the 21st century—was adopted by the governmental conference in Beijing. It included 12 critical areas: poverty, education, health, violence against women, armed conflicts, economy, decision-making, mechanisms for the advancement of women, women's human rights, media, environment and the girl-child. The Platform also contained hundreds of recommendations and strategies for each area. For the first time at the UN women's conferences, tobacco was recognized as a women's health issue in the body of the general discussions and recommendations (1).

Hundreds of workshops were held at the parallel NGO Forum on a large variety of issues, including violence against women, reproductive rights, trafficking in women, armed conflicts, feminization of poverty and political participation. Participants at the grassroots level shared their experiences on how they organized to fight against development projects that perpetuated gender discrimination. There was also an important transformation of women's self-image as "victims" to women as leaders and visionaries. For example, at the workshop on Asian Women's Alternatives in Action, participants from various Asian countries reported innovative and dynamic strategies and practices and showed their determination to work toward a world based on gender justice through women's empowerment. The theme of the NGO Forum, "Look at the World Through Women's Eyes," reflected this newfound confidence and assertiveness.

Since that time, women's awareness and support for tobacco control has grown. A major turning point was the gathering of nearly 500 women from 50 countries in Kobe, Japan in November 1999 at the WHO Conference on Women and Tobacco. After returning to their countries, many women leaders carried out national campaigns and media events and joined forces with tobacco control programmes. Anti-tobacco activities led by women's groups have grown in countries such as Bangladesh, Japan, Laos, Turkey, Cuba and Brazil.

Signs are also evident of a growing awareness and strategy for mobilization at UN women's events. It is noteworthy that in l999 and 2000, the Commission on the Status of Women, which oversees the implementation of the Platform for Action, included women and tobacco in its working documents. Similarly, at its session in 2000, the Committee to Eliminate All Forms of Discrimination against Women (CEDAW) requested that governments report on tobacco use under Article 12. A women's caucus at the NGO Alliance on the Framework Convention on Tobacco Control was also begun during the FCTC negotiations held in Geneva held in October 2000 (2, 3).

ASIAN WOMEN'S ANTI-TOBACCO ORGANIZATIONS

Even with these encouraging signs, much remains to be done. In the Asia region, overall prevalence of tobacco use among women varies. However, in most countries, until recently the incidence of smoking has been relatively low and women's groups have not seen tobacco use as a priority issue. All this is slowly changing. The following is an account of Asian anti-tobacco organizations that, although small in membership, laid the groundwork for a stronger movement today. As taboos against women smoking in public subsided in many traditional Asian societies, well-educated, emancipated women increasingly used tobacco. Some health-conscious groups, nevertheless, prevailed in their struggle to control the tobacco epidemic among women.

Japanese Non-Smokers' Rights Group

Around the time that a Japanese Non-Smokers'Rights Group was formed, feminists in Nagoya founded the Women's Group to Eliminate Harm of Tobacco in 1977. The women's liberation movement in the early 1970s claimed the equal right to smoke, and many young feminists started to use tobacco. However, those feminists who objected to smoking challenged this idea and insisted that men and women should both stop smoking.

Ayako Kuno, one of the eight founding members of the Group, wrote in the magazine *Women's Revolt*, "I realized recently that most feminists smoke. I felt sick of the polluted air. I myself used to look positively at women smoking because it seemed they challenged the traditional social norm based on Confucian patriarchal ideology that smoking is not women's behavior. However, I began to question if smoking means women's liberation, because tobacco is poison and harmful to health and the environment."

The issue reappeared in 1987 when the Women's Action on Smoking was formed in Tokyo by female doctors, teachers, writers and working women who were concerned about smoking among young women. According to Nobuko Nakano, one of the founders, its main objectives were non-smokers'rights and prevention of smoking among young women (4). Its members focused their activities on anti-smoking education in schools and lobbying and established a hotline for non-smokers to address passive smoking in the workplace and a campaign to remove tobacco vending machines.

The Consumers Association of Penang

The Consumers Association of Penang (CAP) in Malaysia, an internationally recognized consumer advocacy group, was a pioneer organization that started an anti-smoking campaign in 1973. Since then, it has organized numerous seminars, forums, and exhibitions and published and distributed booklets, educational kits, posters and stickers to inform people of the negative effects of tobacco smoking on health, the environment and the economy.

CAP urges women to play active roles in smoking prevention and cessation and provides concrete suggestions to women of various fields, including:

- Women as health professionals can actively promote a tobacco-free lifestyle. Women as doctors and nurses can serve as educators and disseminators of information.
- Women in the media can reverse the social acceptability of smoking. They can promote non-smoking as an attractive and healthy lifestyle and undo the damage done by others in the media.
- Women in politics/government can be instrumental in passing anti-smoking legislation and regulations and should advocate stricter laws.
- Women in sports should boycott sports activities sponsored by the tobacco industry, as participation in such activities implies an endorsement of smoking.

ASH Thailand

The Women and Smoking Project in Thailand was an NGO formed by 12 health organizations in 1986. It was the first project in Thailand to deal exclusively with tobacco control, and in 1997 became the Action on Smoking and Health Foundation of Thailand (ASH Thailand). Among its activities are those designed for youth, including Smoke-Free Schools 2000. ASH cooperates closely with the National Council of Thai Women, an umbrella group that has taken strong anti-tobacco initiatives in recent years.

One special project called "Thai women don't smoke" was set up in 1995 to counter the tobacco companies' efforts to encourage women to start smoking. It focuses on the effects of smoking on appearance and on children's health and promotes the view that smart women do not smoke. The mass media has been actively involved in the project, and ASH works closely with three national beauty contests: Miss Teen Thailand, Miss Thailand and Miss Thailand World.

The Consumers' Union of Korea

The Consumers'Union of Korea, established in 1970, started a no-smoking campaign in 1984 to stop the spread of tobacco use among young people. The Union has 25,000 mostly women members and 121 member firms. Among its activities and goals are:

- Demonstrations and press releases;
- Street rallies on World No Tobacco Day;
- Protests of tobacco-sponsored events, e.g., Marlboro Concert;
- Stronger warning labels;
- Ban on tobacco vending machines.

THE ASIAN WOMEN'S HEALTH MOVEMENT

It is vitally important to mobilize women at the local level to participate in the anti-smoking campaign. In a number of countries, such as in India, Bangladesh, Nepal, the Philippines and Malaysia, many women's organizations are very committed to the advancement of women's health and are working on important health issues (5). The following groups have not focused on women and tobacco issues to date. However, it is important to enlarge the participation and involvement of such groups. This section provides examples of organizations that are, in most cases, potential allies for tobacco control.

Center for Health Education, Training and Nutrition Awareness (CHETNA)

CHETNA, which means "awareness" in several Indian languages, is an NGO based in Gujarat, India. Established in 1980 with the mission of contributing to the empowerment of disadvantaged women through health education, CHETNA's Women and Health Programme aims to enable women and communities to

initiate, manage and sustain comprehensive, gender-sensitive primary health care for all. Its main activity is to train women and men from NGOs as well as government, using the participatory approach to gender and health, reproductive health, emotional and mental health, aging women, and traditional health and healing practices. CETNA's communications strength is its adaptation to the local social, cultural and economic conditions of its constituents.

Baudha Bahnipati Family Welfare Project (BBP)

This project of the Family Planning Association in Nepal formed its first women's group in 1990. Members of the group take a comprehensive approach to improving their overall livelihood, conducting informal classes on literacy, savings and credit, animal raising, fodder production and health camps where women can learn about gynecology, vasectomy, and dental, eye and general health check-ups. The purpose is to help women gain confidence, security and dignity, as well as improve their standards of living.

Bangladesh Women's Health Coalition (BWHC)

The activities of the Bangladesh Women's Health Coalition are based on three principles: 1) each woman should be treated with respect; 2) each woman's particular needs should be carefully discussed with her by health-care professionals; and 3) each woman should be provided with sufficient information and counseling to make her own choices about her reproductive health.

BWHC has seven clinics that offer a choice of family planning methods; women paramedics recruited from the community staff the clinics. Doctors, nurses, and attendants are also involved in counseling, as BWHC considers counseling crucial to overcoming any class barriers between the counselors and clients. BWHC also organizes training programmes for government paramedics.

Gabriela

The Gabriela is a national coalition of women's organizations in various sectors of the Philippines. Its Commission on Women's Health and Reproductive Rights provides community-based health services for women, men, and children. The Commission has a women's clinic in Metro-Manila and two pilot communities; in one year, it provided approximately 1,500 consultations, 1,100 of which were to women. The Commission's objectives are to develop women's health initiatives and to integrate these with the overall developmental efforts of the communities. Two pilot communities have already developed their own management plan. The outstanding characteristic of Gabriela's "health service to sisters in need" is to let women in communities organize themselves and manage by themselves.

Asian-Pacific Resource & Research Centre for Women (ARROW)

ARROW, based in Malaysia, advocates women-centered and gender-sensitive policies and programmes for women's health based on, and further evolved from, comprehensive public health care. This NGO provides practical information, resources, and research findings. The information kit, "Towards Women-Centered Reproductive Health" is an action-oriented introduction to women-centred reproductive health and is most useful for women's health projects and movements at the grassroots level. It can also be used for advocacy for government public health policy. ARROW adopts the life-cycle approach, covering prenatal, girlhood, adolescence, menopause and old age. It also addresses critical areas of women's health that have been given little attention, including occupational health, emotional and mental health, and violence against women.

As evident in this brief review, these networks and alliances have the potential to provide essential links in the worldwide movement to control tobacco and advance women's health, but stronger connections must be made between these networks and the tobacco control movements. It is crucial that information be disseminated on the hazards of tobacco use on women's health among these NGOs and that strong leadership skills be fostered.

LATIN AMERICAN AND CARIBBEAN WOMEN'S HEALTH MOVEMENT

Feminism started in Latin American and Caribbean countries simultaneously with its growth in North America and Europe. In the late 19th and early 20th centuries, important feminist leaders in Latin American countries provided leadership and stimulated activism to improve women's status and access to education, including universities. Women's rights to health as well as economic and political participation were the main areas of concern for the early activists.

Feminism in the Latin American and Caribbean region promoted women's autonomy and liberation. At the same

time, the incorporation of traditional male activities changed women's lifestyles to include smoking. Feminist arguments used to improve women's status were adopted, and their ideology was manipulated by tobacco advertising. Initially, advertising associated tobacco with sophisticated and glamorous women. Images of women who succeeded in men's activities, like Amelia Earhart, were also used. In the last decade, messages targeting women linked tobacco to liberty and pleasure.

Although the tobacco industry succeeded in courting many emancipated women, the beginnings of an opposition were forming. In 1984, representatives from sixty women's health groups who attended the First Regional Women and Health meeting in Colombia created the Latin American and the Caribbean Women's Health Network (LACWHN). The Network is made up of approximately 2,000 member groups, principally from Latin America and the Caribbean (approximately 80 percent), as well as from North America, Europe, Africa, Asia and the Pacific. Its board of directors is composed of nine health activists from different countries in Latin America and the Caribbean with a headquarters in Santiago, Chile. One of its main activities is a quarterly publication, *Women's Health Journal*, and a special annual publication, *Women's Health Collection*. During its first 10 years, the Network was coordinated by Isis International, a regional feminist NGO based in Santiago, Chile. In 1995, by agreement of its board of directors, LACWHN became an autonomous institution and functions currently as a foundation.

The LACWHN makes an important contribution by disseminating and promoting research and studies on women's health issues and mobilizing groups and activists to advocate and defend these issues. Such mobilization activities were organized as campaigns around specific days designated to draw attention to specific health issues. The network also promotes activities among its members and disseminates health information to interested parties, such as women's groups, academic institutions, governmental health and social authorities, health and associated professionals, the private sector, journalists and policy makers.

A review of women's health campaigns promoted by the LACWHN provides some perspective on women's health activities and their possible applications to tobacco control. The first LACWHN campaign focused on maternal mortality, and the date of 28 May 1987 was declared the first Women's Health Day set aside to prevent maternal mortality. National maternal mortality rates in the region and the difficulties to reduce it were the motivating factors in developing a campaign to influence political will and social support.

Since 1988, the Women's Health Day has been adopted internationally and celebrated worldwide by women's health groups and other interested parties. Other campaigns have been established on specific days to promote awareness on such health topics as abortion (28 September), violence against women and girls (25 November), human rights (10 December), and HIV/AIDS (1 December).

Although the tobacco industry succeeded in courting many emancipated women, the beginnings of an opposition were forming.

The initial campaign was initially a protest. Later, the campaign began to incorporate proposals for change. Its visibility and impact grew, while mobilization groups increased. In 1987, 100 groups from 45 countries participated, and today more than 1,500 groups participate in approximately 80 countries. Health workers joined with women's health activist groups to diversify and expand participation.

Background papers providing data, analyses, and perspectives were produced and published. Interactions between academic groups as well as between health professionals and grassroots women's organizations produced an expansion of conceptual boundaries, providing credibility and strengthening women's lobbying efforts. Interaction with UN agencies, international and national research/funding organizations, and governments increased the impact of local and national actions. The media were incorporated from the beginning, and recently media attention has increased and heightened the campaign's visibility (6).

The principal indicators to evaluate the campaign remain the numbers of participants and the alliances made, as well as the programmes and actions established by health services. Over the last three years, small grants (from US$300-1,000 each) for women's groups were distributed for local projects. Small grants improved grassroots women's organizations. Most activities are done voluntarily, and it is important to maintain that characteristic to preserve credibility and enthusiasm (7).

Recently, the LACWHN organized regional training and the development of educational programmes for human resources in women's health issues from a gender perspective. These programmes were initiated in universities and academic units by women's health network members associated with national women's health NGOs to disseminate scientific knowledge on women's health from a gender perspective. In addition, scholarships for short training programmes at women's health NGOs were organized to share successful women's health programmes and services, particularly in sexual and reproductive health and violence against women.

In 1992, the LACWHN began to organize and promote, through member meetings, a regional preparatory process for the International Conference on Population and Development (ICPD), to be held in Cairo, Egypt, in 1994. The role of women's health activists in the ICPD in Cairo was crucial in adopting the Plan of Action by consensus. The LAWCHN and its members were key players in Cairo as well as in Beijing.

In 1995, the LACWHN developed a project to monitor implementation of the ICPD Plan of Action in several Latin American and Caribbean countries, with the cooperation of the United Nations Fund for Population Activities (UNFPA). From 1996 to 1999, five countries in Latin America were monitored by women's health NGOs in partnership with UN agencies and governments. In many Latin American and Caribbean countries, democracies were recovered in the 1980s, but the participatory process for women was rare. Women's participation in development through the monitoring of governmental implementation strengthened democratic procedures. Through this project, many women's health leaders and activists developed and increased their negotiation and advocacy capacities and tools to promote national, regional and local women's health policies and programmes. Similar experiences in other countries of the region outside the project will increase and improve women's participation.

Today, approximately 80 percent of LACWHN members are based in Latin America and the Caribbean. The scope of themes, activities and goals of those groups is very broad. Not all groups or NGOs are women's groups, and not all work only on health. Some groups are more activist-oriented, while others provide services and sponsor academic activities. Their actions influence the grassroots, local, national, regional, and international level.

In a study of its members in 1997-98, the LACWHN database considered 30 categories of thematic issues and subdivided each one for more specific classification of members'interests and activities. They are all related to women and tobacco control but do not necessarily give the issue prominence in their programmes. The potential, however, is apparent as these concerns include human rights, family, mental health, women's identity, life cycles, communications, legislation, environment, religions and economic issues.

Ageographical analysis (Table 1) reported the numerical importance of groups in the different subregions. In the Andean area where community-based organizations are a long-standing tradition, many women's groups matured decades ago. They incorporated early into the network for broader interaction with other groups. In the Southern Hemisphere, where many countries were ruled by dictatorship governments until the 1980s, women's groups have developed only in the last decade.

TABLE 1: WOMEN'S HEALTH GROUPS IN THE LACWHN BY SUBREGIONS 1998

SUBREGION	AMOUNT
Caribbean:	130
- English Caribbean	81
- Latin Caribbean	49
Puerto Rico	21
Mexico	288
Central America	208
Andean Area	404
Southern Hemisphere	320
Brazil	286
TOTAL	1657

Source:(8).

Few of those registered groups currently have tobacco-control activities. Their primary focus is on the impact of sexual and reproductive health issues as well as mental health and medical care policies on health care reform. At the same time, great potential exists for integrating anti-tobacco campaigns into these activities. There is also potential for the dissemination of research and news related to tobacco and health through the LACWHN journal, *Women and Health.*

A key reason for the lack of involvement on the part of women's groups is that they were not invited to participate in tobacco control activities by international, regional or national networks, governments or UN agencies. The frequent and fluid relations of LACWHN with UN agencies have been related to sexual and

reproductive health matters and other issues of growing awareness, such as violence against women, women's impact on the health care reform process, and other women's health matters.

In Latin America and the Caribbean, the WHO Tobacco Free Initiative should expand its scope and strengthen its social base. Awareness and mobilization of women's health activists in the region are basic requirements for reaching women and girls. The advantage of having those groups organized and connected through the LACWHN benefits coordination and promotion of any tobacco control activities. The wide range of women's groups affiliated with the LACWHN could ensure reaching women and girls, including grassroots and rural women.

REACHING OUT TO OTHER WOMEN'S NETWORKS

In addition to these women's NGOs actively involved in health promotion, a number of regional and international networks concerned with sustainable development and women's rights could be mobilized in tobacco control (9). One of the most important roles of global networks is the lobbying and advocacy of the United Nations and other relevant international agencies.

The International Network of Women Against Tobacco (INWAT) was founded in and is a specialized network of approximately 600 members in over 60 countries. INWAT is working for better understanding of the complicated effects of tobacco growing, manufacturing, and consumption on women and girls worldwide. A number of other women organizations have indicated a strong interest in joining in the anti-tobacco movement. Among these are the NGO Committees for the Commission on the Status of Women, which is based in New York, Vienna and Geneva, as well as the European Women's Lobby, which has a number of women's groups working in tobacco control. The Women's Global Network for Reproductive Rights has members in more than 110 countries and is a strong potential ally. Other internationally important groups are the International Association of University Women, the Girl Guides Association, and Soroptimist International, which has almost 100,000 members in 119 countries. It is worth noting that recently the Soroptimist has decided to make tobacco control one of its official priorities.

As tobacco control efforts focus more on the Framework Convention on Tobacco Control, the importance of including women lawyers and human rights organizations will grow. An example of an active regional network is the Asia Pacific Forum on Women, Law and Development (APWLD). This NGO was an outcome of the Third World Forum on Women, Law and Development held in Nairobi, Kenya in 1985. The Asian participants formed APWLD as a regional organization committed to enabling women to use law as an instrument of social change for equality, justice and development.

The breast-feeding and infant formula campaigns are important allies because their organizations have had considerable experience mobilizing at an international level, calling on conventions to deal with aggressive marketing and commercial interests. In Asia, the breast-feeding campaign was launched in the 1970s when a large numbers of babies in the third world were dying after bottle-feeding. The women's boycott of Nestle, one of the world's largest producers of infant formula, is reportedly the largest boycott in the world to date. The International Baby Food Action Network (IBFAN) was founded by six members in 1979 and grew to 140 groups by 1989.

In addition to consumer organizations, a number of international reproductive and human rights networks continue to lobby on behalf of women's health. These organizations have expressed interest in the tobacco issue and should be supported as advocates in tobacco control. An example of a strong international network is the Women's Global Network for Reproductive Rights and Women's Environment and Development Organization (WEDO). WEDO is an international advocacy network that works to achieve a healthy and peaceful planet, with social, political, economic and environmental justice for all, through the empowerment of women in all their diversity and through their equal participation with men in decision-making from grassroots to global arenas. It was actively involved in the Rio Summit and since has played an important role in convening a "linkage caucus" that helps to integrate NGO views concerning various UN conferences. Most recently, it has helped to convene the women's caucus of the NGO Alliance on the FCTC.

DISCUSSION

The greatest challenge facing women's organizations is to galvanize the leadership to prevent a rising epidemic of tobacco use among women, particularly young women, before it starts. To be successful, women's groups involved in tobacco control programmes have

argued that it is necessary to start from girls'and women's own experiences and take into account the broader context of women's lives. This is possible when women's leadership is prominent within tobacco control. Key reasons why women's organizations should be involved in tobacco control are:

- Working with women's groups helps to reach other groups, such as husbands and partners, and children, to influence their behaviour and reduce their exposure to environmental tobacco smoke.
- Working with women's organizations can widen the political support for tobacco control, taking it beyond the health community. This may be particularly important when seeking support to introduce specific legislative or regulatory mechanisms.
- Women leaders offer expertise on women's perspectives and experiences, particularly in networking and building alliances.

Below are several barriers that should be recognized:

- An emphasis on emancipation and autonomy may provoke a hostile reaction to measures perceived as restrictive of individual freedom. Smoking may be seen as a symbol of women's emancipation or as an important coping mechanism for women under stress. Some women's organizations are critical of traditional health education approaches aimed at changing women's smoking; they see this as individualistic, victim-blaming, guilt-inducing and disempowering.
- Funding needs have prompted some women's organizations to accept money from tobacco companies. For example, in the United States, Philip Morris spent millions of dollars on women's causes between 1990 and 1995 and supported more than 100 women's groups in 1995.
- Many women's organizations, particularly grassroots and community-based groups, work in a collective, non-hierarchical way. They may view traditional tobacco control activities as top-down and inimical to the way they work. Information flow between national and community networks, and between international and national networks, can often be difficult.

Considering these issues, it is worth remembering what Dr Brundtland said: "Tobacco control cannot succeed solely through the efforts of individual governments, national NGOs and media advocates. We need an international response to an international problem. I believe that a response will be well encapsulated in the development of an International Framework Convention" (2). Therefore, it is necessary to strengthen the FCTC so that the women's health movement can draw upon the authority of an international treaty. Armed with a tobacco treaty, women's health activists can promote a comprehensive approach to women's health in which they include tobacco control activities and bring to bear important human rights treaties, such as the Convention on the Elimination of All Forms of Discrimination Against Women. It is vitally important to enlist women's leadership at all levels in the advocacy campaign for the Framework Convention on Tobacco Control.

RECOMMENDATIONS

WHO, governments and tobacco control programmes should:

- Contact a national coalition or network of women's organizations and influential women in each country and provide information on tobacco hazards and the tobacco industry;
- Involve regional and global women's NGO networks in fighting the tobacco epidemic and urge them to put the issue on their agenda through their member organizations;
- Utilize the Convention on the Elimination of All Forms of Discrimination Against Women and the Convention on the Rights of the Child to strengthen a gender perspective in the Framework Convention on Tobacco Control;
- Urge male-oriented anti-smoking groups to work together with women's groups in each country;
- Contact groups working on the environment, consumers'rights, human rights, labor, academia, religion, peace, children's rights and the media; and
- Establish a national committee to deal with tobacco and health problems for women. This committee should include doctors, nurses, teachers, lawyers, journalists, psychologists and leaders of women's organizations.

WHO, governments and tobacco control programmes should monitor the marketing practices of tobacco companies by taking the following actions:

- A Women's Watch Group should be formed to monitor the FCTC and the marketing practices of tobacco companies; and
- Regional Women's Conferences on Tobacco should be held to form regional networks against smoking.

A media watch and strategy should include the following:

- New information technologies and electronic media that reach women should be used for the anti-tobacco campaign;
- A commercial film on women and tobacco should be made; and
- A Women's No-Smoking Week should be implemented. A variety of events for the week would be promoted in each country and worldwide.

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Virginia Ernster

Virginia Ernster is a Professor of Epidemiology at the School of Medicine at the University of California, San Francisco, where she is also Director of the Tobacco Control Program at the University Cancer Center. She has been a Member and Chair of the Policy Advisory Committee of the Community Intervention Trial for Smoking Cessation at the National Cancer Institute. Since 1991, she has served as Vice-Chair of the Board of Trustees of the Northern California Cancer Center. She is also a member of the Board of Scientific Advisors of the National Cancer Institute, and a Senior Scientific Editor on the forthcoming U.S. Surgeon General's Report, "Women and Smoking." She received a M.Phil. and Ph.D. in Sociomedical Sciences from Columbia University. In 1998, she was selected as one of the 75 "Heroes of Public Health" in conjunction with the 75th Anniversary of Columbia University's Public Health.

Margaretha Haglund

Margaretha Haglund is Head of the Tobacco Control Programme at the National Institute of Public Health in Sweden. She is President of the International Network of Women Against Tobacco and a member of the WHO Policy/Strategy Advisory Committee for the Tobacco Free Initiative Project. In addition, she is a Member of the Swedish Network for Smoking Prevention and one of the two Swedish representatives in the European Network for Smoking Prevention. She was a member of the Steering Committee of the 11th World Conference on Smoking and Health, Chicago, 2000; and of the Second European Conference on Tobacco or Health held in Las Palmas in 1999. In 1995, she received the World Health Organization medal for her efforts in combating smoking in Sweden and other countries.

Saundra MacD.Hunter

Saundra MacD. Hunter is a professor in the Department of Public Health and Preventive Medicine at Louisiana State University Medical Center. She developed the tobacco, alcohol and psychosocial research protocols for the Bogalusa Heart Study. She was a visiting professor for the Medical Research Council, Centre for Epidemiological Research in South Africa. Currently, she is a psychotherapist for the Committed to Kids Weight Loss Program and a licensed clinical psychiatric social worker with research, treatment and prevention interests in tobacco and obesity.

Rowena Jacobs

Rowena Jacobs is a Research Fellow at the Centre for Health Economics at the University of York, United Kingdom where she is also completing her D.Phil. in Health Economics. She received her Masters Degree in Economics at the University of Cape Town *cum laude.* While at the University of Cape Town as a researcher and lecturer, she ran the Economics of Tobacco Control Project under the auspices of the Medical Research Council. She also worked as a consultant for the World Bank on its publication on tobacco control and policies for developing countries.

Nancy J.Kaufman

Nancy Kaufman is a Vice President of the Robert Wood Johnson Foundation. She holds a graduate degree in Administrative and Preventive Medicine from the University of Wisconsin Medical School, and a Bachelor of Science degree in nursing from the University of Wisconsin. She recently completed a term as a member of the National Advisory Council of the Agency for Health Care Policy Research. Kaufman is Immediate Past Chair of the American Public Health Association's Alcohol, Tobacco and Other Drugs Section. She served as Chair of the Federal Office for Substance Abuse Prevention's Pregnant and Postpartum Women and Their Infants Grant Review Committee. Kaufman was Program Chair of the Year 2000 World Conference on Tobacco OR Health, held in Chicago.

Yayori Matsui

Yayori Matsui is a journalist who received her education at the Tokyo University of Foreign Studies, University of Minnesota and University of France. In 1961, she joined the Asahi Shimbum, a leading daily newspaper in Japan as the only female reporter. She helped found the Asia-Japan Women's Resource Center and is active in NGOs such Violence Against Women in War Network, Japan and the Japanese Filipino Children's Network. She coordinated national and international conferences, such as the Asian Tribunal on Women's Human Rights and the International Conference on Violence Against Women in War and Armed Conflict Situation. She has published more than ten books among which are "Women's Asia" and "Women in the New Asia."

Nobuko Nakano

Noboko Nakano has been teaching at Japanese junior high schools for 35 years and helped found a teachers'study group for smoke-free education in 1983. A founding member of Women's Action on Smoking, she helped organize campaigns to inform the public about the hazards of passive smoking at home and at work. She was a participant at the World and APACT tobacco conference since 1987, acted as a Secretary General of the Third APACT Conference and had been a liaison between the international tobacco control movement and Japanese movements.

Mimi Nichter

Mimi Nichter is an Assistant Professor of Anthropology at the University of Arizona. Previously, she taught in the International Health Program, Arizona Graduate Program in Public Health and the Arizona Prevention Center, University of Arizona. For the past 25 years, she has been conducting research on maternal and child health issues and the household production of health in Karnataka State, South India. She completed her Post-Doctoral Fellowship in Medical Anthropology in 1996 at the University of Arizona, Dept. of Anthropology. She completed her Ph.D. at the University of Arizona, Department of Family Studies and Human Development. She has recently completed a book entitled "Fat Talk: Body Image and Dieting among Teenage Girls."

Jonathan M.Samet

Jonathan Samet is Professor and Chairman of the Department of Epidemiology and the Director of the Institute for Global Tobacco Control of the Johns Hopkins University School of Hygiene and Public Health. Samet received a Bachelor's degree in Chemistry and Physics from Harvard College, a M.D. degree from the University of Rochester School of Medicine and Dentistry and a Master of Science in epidemiology from the Harvard School of Public Health. He served as Consultant Editor and Senior Editor for Reports of the Surgeon General on Smoking and Health. He was a member of the Science Advisory Board for the U.S. Environmental Protection Agency and Chairman of the Biological Effects of Ionizing Radiation Committee VI of the National Research Council. He is presently Chairman of the National Research Council's Committee on Research Priorities for Airborne Particulate Matter and was elected to the Institute of Medicine of the National Academy of Sciences in 1997.

Rose Vaithinathan

Rose Vaithinathan is the Director of School Health Services with the Ministry of Health in Singapore. She was involved in the early planning and implementation of Singapore's National Smoking Control Programme. The School Health Service is responsible for the Programme's implementation in schools.

Richard A.Windsor

Richard Windsor received a B.S. with Honors in Health Education at Morgan State College and a M.S. and Ph.D. in Health Education from the University of Illinois. He was a member of the Senior Executive Service of the US Government and Associate Director for Prevention of the National Heart, Lung, and Blood Institute-NIH. He is currently a Research Professor and Principal Investigator of the NIH funded—Smoking Cessation/Reduction in Pregnancy Trial (SCRIPT). He received the 1997 C. Everett Koop National Health Award for SCRIPT. He is also a Senior Science Advisor to the Robert Wood Johnson Foundation—Smoke-Free Families—National Program Office in the Department of OB/Gyn, UAB School of Medicine.

Gonghuan Yang

Gonghuan Yang is a Professor and Researcher at the Chinese Academy of Preventive Medicine, Institute of Epidemiology & Microbiology. She has served as Director of Disease Surveillance Points system for the World Bank, was a Director of Central Experts Group of Project Disease Prevention, Component of Health Promotion, and set up a Behavior Risk Factors Surveillance System (BRFSS) and Community Environmental Monitor Mechanism. She received a Bachelors Degree of Medicine at West-China Medical University and was awarded a Masters Degree in Public Health by the Chinese Institute of Preventive Medicine. She has also been a research fellow in the Department of Epidemiology of the School of Public health, Harvard University in the US and a fellow at WHO/TFI.

Soon-Young Yoon

Soon-Young Yoon received her A.B. in French literature and Ph.D. in anthropology from the University of Michigan. She was a Social Development officer for UNICEF for the Southeast Asia office as well as the Social Scientist for Health Behavior Research at WHO/SEARO in New Delhi. A former Fulbright scholar, she taught at Ewha Woman's University in Seoul, Korea where she helped to establish a women's studies curriculum. In 1995, she was one of the organizers of the NGO Forum on Women at the Beijing women's conference, acting as the UN Liaison for that meeting. Formerly a Senior Technical Officer for the World Health Organization's Tobacco Free Initiative, she helped organize the Kobe conference on women and tobacco. Currently, she is the New York Liaison for the Campaign for Tobacco Free Kids Project on the Framework Convention on Tobacco Control and a columnist for the EarthTimes newspaper.