

Part I

Setting the theoretical foundation for tobacco control

Part I

Setting the theoretical foundation for tobacco control

- 1.** Tobacco as a risk factor: health, social and economic costs
- 2.** The tobacco industry: global strategies
- 3.** Tobacco control interventions: the scientific basis
- 4.** WHO Framework Convention on Tobacco Control: the political solution

1

Tobacco as a risk factor: health, social and economic costs

*Tobacco surely was designed to poison,
and destroy mankind.*

— Philip Freneau



DISEASE BURDEN

Active tobacco use

Tobacco is the major preventable cause of death in many parts of the world today. In developed countries, where the tobacco epidemic took hold much earlier than in the rest of the world, tobacco-related cardiovascular and lung diseases and cancers cause a significant proportion of total deaths and chronic disability. Among countries undergoing the epidemiologic transition, chronic diseases caused by tobacco are rapidly overtaking the more traditional causes of mortality. In fact, current estimates suggest that smoking prematurely kills as many people in the developing as in the developed world. Even in those countries where infectious diseases are the main cause of death, the effects of tobacco use compound the lethality of pulmonary infections such as pneumonia and tuberculosis.

Tobacco use is harmful and addictive. All forms of tobacco cause many fatal and disabling health problems throughout the life cycle.

Scientific evidence has conclusively shown that smokers are more prone to different types of cancer, particularly lung cancer. In addition, smokers are at far greater risk of developing heart disease, stroke, emphysema and many other fatal and non-fatal diseases. If they chew tobacco, they risk cancer of the lip, tongue and mouth. There is no safe way of using tobacco.

Women who smoke run even more risks than men. For example, the adverse effects of oral contraceptive use are markedly increased in women smokers. Osteoporosis is accelerated with tobacco use. Some evidence indicates that fertility is impaired with smoking. Tobacco use is also associated with a higher rate of spontaneous miscarriages. In pregnancy, smoking contributes to perinatal complications such as bleeding, which is dangerous for both mother and fetus, especially in poor countries where health facilities are inadequate. Intrauterine growth retardation and low-birth-weight babies are known outcomes of smoking during pregnancy. The harm from maternal smoking can extend beyond pregnancy, affecting the child's growth and development. This is often compounded by the child's exposure to second-hand smoke from parents and other adults.

Tuberculosis kills about 1.6 million people each year. A study published in *The Lancet* in 2003 showed that smoking causes half the male tuberculosis deaths in India. Tobacco use also increases the risk of developing clinical TB, which can kill and can easily be spread to others.

—V Gajalakshmi et al., 2003

Passive smoking

Smoking harms non-smokers, too. The first conclusive evidence of the danger of passive smoking came from a study carried out by Takeshi Hirayama, in 1981, on lung cancer in non-smoking Japanese wives married to men who smoked (1). Surprising at the time, those women showed a significantly increased risk of dying from



lung cancer, despite never having smoked a cigarette. Hirayama et al. believed that passive smoking (i.e. breathing in the smoke from their husbands) caused these women’s excess cancer risk. About 40 further studies have confirmed this link.

Today, research indicates that passive smoking can also give rise to other potentially fatal diseases such as heart disease and stroke, and new scientific evidence on the adverse effects of second-hand smoke continues to accumulate.

An hour a day in a room with a smoker is nearly a hundred times more likely to cause lung cancer in a non-smoker than 20 years spent in a building containing asbestos.

— Sir Richard Doll, 1985

Table 1. Adverse health effects of smoking

Body system or organ	Established or suspected adverse health effect of cigarette smoking	Body system or organ	Established or suspected adverse health effect of cigarette smoking
Lungs	<ul style="list-style-type: none"> • Lung cancer • Chronic obstructive pulmonary disease • Increased severity of asthma • Increased risk of developing various respiratory infections 	Bones	<ul style="list-style-type: none"> • Disc degeneration • Osteoporosis • Osteoarthritis • Less successful back surgery • Delayed fracture healing • Musculoskeletal injury
Heart	<ul style="list-style-type: none"> • Coronary heart disease • Angina pectoris • Heart attack • Increased risk of repeat heart attack • Arrhythmia • Aortic aneurysm • Cardiomyopathy 	Reproduction	<ul style="list-style-type: none"> • Infertility • Impotence • Decreased sperm motility and density • Miscarriage • Earlier menopause
Blood vessels	<ul style="list-style-type: none"> • Peripheral vascular disease • Thromboangiitis obliterans (Buerger’s disease) 	The unborn child	<ul style="list-style-type: none"> • Fetal growth retardation • Prematurity • Stillbirth • Enhanced transmission of HIV to fetus • Birth defects • Intellectual impairment • Sudden infant death syndrome
Skin	<ul style="list-style-type: none"> • Earlier wrinkling • Fingernail discoloration • Psoriasis • Palmoplantar pustulosis 	Brain	<ul style="list-style-type: none"> • Transient ischaemic attack • Stroke • Worsened multiple sclerosis
Cancer	<ul style="list-style-type: none"> • Lung cancer • Esophageal cancer • Laryngeal cancer • Oral cancer • Bladder cancer • Kidney cancer • Stomach cancer • Pancreatic cancer • Vulvular cancer • Cervical cancer • Colorectal cancer 	Others	<ul style="list-style-type: none"> • Cataracts • Macular degeneration • Snoring • Periodontal disease • Stomach and duodenal ulcers • Crohn disease • Impaired immunity



Over 60% of children in Argentina, Bulgaria, China (Tianjin), Cuba, India, Indonesia, Jordan, Lebanon, Mali (Bamako), the Philippines, Poland, Uruguay and the West Bank are exposed to passive smoking at home.

— Global Youth Tobacco Survey, 2003

Children are at particular risk from exposure to adults' smoking. Unborn babies can be harmed by their mothers' exposure to other people's smoking. The effects are magnified when combined with further exposure to second-hand smoke after birth. Tobacco use in the home is a risk factor in sudden infant death syndrome (SIDS). Passive smoking can cause pneumonia, bronchitis, coughing and wheezing, and it can aggravate asthma and middle ear disease in young children. Some studies (2, 3) appear to link exposure to second-hand smoke in childhood with neuro-behavioural impairment and cardiovascular disease in adulthood. After reviewing the evidence, a WHO consultation on the effects of environmental tobacco smoke (ETS) on children in 1999 concluded that ETS is a real and substantial threat to child health, causing death and suffering throughout the world.

Deaths from tobacco use (3)

Of the people alive today, 650 million will eventually be killed by tobacco.

Cigarettes kill half of all lifetime users, and half of those die in middle age (35–69 years). There is no other consumer product on the market that is remotely as dangerous, or kills as many people. Tobacco kills more than AIDS, legal drugs, illegal drugs, road accidents, murder and suicide combined.

Tobacco already kills more men in developing than in industrialized countries, and it is likely that deaths among women will soon be the same.

Every day more than 13 000 people around the world die from tobacco. Assuming constant tobacco use prevalence, the World Health Organization projects that between 2000 and 2025 the number of smokers will rise from approximately 1.2 billion to more than 1.7 billion and the annual number of deaths, which is currently estimated at about 5 million, will almost double in 20 years (see Table 2).

TOBACCO CONSUMPTION

Tobacco use initiation and continuation

Smokers and other tobacco users start and continue for different reasons. Children and young people can start smoking from curiosity, risk taking, rebellion, parental and sibling smoking, peer pressure, the desire for weight control, the desire to look 'grown up', and the perception that tobacco use is normal or 'cool'. Aggressive promotion by the tobacco industry and permissive environments that make tobacco products readily available and affordable play a major role in inducing young people



Table 2. Current and projected estimates of the tobacco epidemic (if tobacco use prevalence stays at the 2003 level)

	Year	
	2000	2025
Number of smokers (billions)	1.2 ^a	1.7 ^a
Males (age 15 years and older, billions)	1.0 ^a	1.4 ^a
Females (age 15 years and older, billions)	0.2 ^a	0.3 ^a
Number of smokers in developing countries (billions)	0.9 ^a	1.4 ^a
Annual tobacco deaths (millions)	4.9 ^{b,c}	10 ^{d,e,f} (2030)
Children exposed to ETS (millions)	700 ^g	770 ^h
Economic losses (US\$ billions)	200 ⁱ (1994)	—
Smokers in developing countries and transitional economy countries	84% ^a	88% ^a

^a Source: Guindon & Boisclair (4)
^b Source: WHO (5)
^c Source: *Lancet* (6)
^d Source: Ezzati & Lopez (7)
^e Source: WHO (8)
^f Source: Peto (9)
^g Source: WHO (10)
^h Source: WHO (11)
ⁱ Source: Barnum (12)

to take up smoking. In certain cultures, oral tobacco use forms part of the social tradition, and can begin in early childhood.

While tobacco use is prompted by several different factors, the continuation of tobacco use is largely fuelled by addiction. Human and animal studies have shown that nicotine is the substance in tobacco that leads to addiction. Nicotine is readily absorbed from the lungs or mouth, rapidly enters the blood stream, dispersing throughout the body and interacting with specific receptors in the brain (14). Some of these receptors are responsible for the feeling of pleasure – the ‘rush’ – that smokers and other tobacco users get from tobacco. Other receptors kick in when nicotine levels begin to drop, causing a constellation of symptoms that characterize the ‘withdrawal syndrome’, similar to what heroin and cocaine addicts experience. People addicted to tobacco need to smoke or chew tobacco regularly and frequently to keep their nicotine levels up, so that they can feel pleasure and avoid the discomfort of withdrawal. Other factors that reinforce tobacco use include social and psychological pressure, lack of knowledge of the risk to health and difficulty in quitting.



Talking points

- In many parts of the world, smokers still do not know about the dangers of tobacco use. For instance, in China, in 1996, 7 out of 10 Chinese smokers thought smoking did them “little or no harm” (14).
- Nicotine addiction is extremely powerful. About 70% of current smokers in high-income countries want to quit, but 80% of those who try to give up smoking fail.

Tobacco consumption patterns (4, 15)

Since the mechanization of cigarette manufacturing at the turn of the 20th century, global consumption of cigarettes has been rising steadily. Today, more people are smoking, and consuming more cigarettes per capita, than ever before. At present, about 1070 million males and 230 million females in the world smoke, generating an epidemic of global magnitude. In developed countries, the prevalence of smoking among adult males is decreasing, but the increasing number of adult male smokers in developing countries offsets this. Smoking is still rising among females in developed countries, with the exception of a few countries such as Australia, Canada, the United Kingdom and the United States. With the expansion of the tobacco industry’s marketing campaigns into the developing world, more and more people are taking up smoking in countries least able to deal with the grave public health consequences of tobacco use.

Tobacco companies produce approximately 7 million tonnes of tobacco annually. Cigarettes represent the largest share of manufactured tobacco products, accounting for 96% by value of total sales. Every year, cigarette factories produce more than 5.5 trillion cigarettes – enough to provide every individual on the planet with 1000 cigarettes. Asia, Australia and the Far East are by far the largest consumers (2715 billion cigarettes), followed by the Americas (754 billion), eastern Europe and former Soviet economies (631 billion), and western Europe (606 billion).

China produces about a third of all the cigarettes in the world. It is also a major tobacco consumer, since nearly 60% of adult Chinese males smoke, representing one-third of all smokers globally. Currently, it is estimated that one out of every three cigarettes in the world is smoked in China.

Youth

Tobacco use often begins before adulthood. The Global Youth Tobacco Survey (GYTS), the largest database of its kind in the world today, has data from 75 sites in 43 countries and the Gaza Strip/West Bank region. It shows that a disturbingly high number of school children between the ages of 13 and 15 are currently using or have tried tobacco. Nearly a quarter of those young smokers began before the age of 10.

The most serious consequences of tobacco use appear later in adulthood. However, there are immediate adverse health effects of smoking that affect the growing number



of young tobacco users. Addiction to nicotine occurs faster in young smokers, and the risks of developing tobacco-related cancer and chronic heart and lung diseases are greater the younger one starts to smoke.

According to the Global Youth Tobacco Survey (16):

- The highest youth smoking rates are found in Central and eastern Europe, parts of India, and some of the Western Pacific islands.
- Current use of tobacco products ranges from 62.8% to 3.3%, with high rates of oral tobacco use in certain regions.
- Current cigarette smoking ranges from 39.6% to less than 1%.
- Nearly 25% of students who smoke admit to having smoked their first cigarette before the age of 10.
- Most current smokers want to stop smoking and have already tried to quit, although very few students who currently smoke have ever attended a smoking-cessation programme.
- Exposure to advertising is high (75% of students had seen pro-tobacco adverts).
- Exposure to environmental tobacco smoke is very high in all countries. In Bulgaria, Northern Mariana Islands, and selected cities in Burkina Faso, India, Indonesia and Mali, over 75% of young people surveyed indicated significant exposure to second-hand smoke in public places.
- Only about half of the students reported that they had been taught in school about the dangers of smoking during the year preceding the survey.
- Girls are smoking as much as boys in more than 30% of surveyed countries.

Adult male

Current geographical distribution and rates of tobacco use among men:

- Most of today's smokers are male, and most live in developing countries. Nearly a third – 300 million – live in China.
- The highest rates of tobacco use are found in Cambodia, Djibouti, Indonesia, Myanmar, Papua New Guinea, and Viet Nam.
- Half of all males in developing countries currently smoke as compared to about 35% in developed countries, a proportion that has fallen in recent decades.
- Trends in both developed and developing countries show that smoking rates among males are slowly declining. However, this is an extremely slow process occurring over decades. In the meantime, millions of males are dying because of tobacco.
- Better educated males are tending to give up smoking, so tobacco use is becoming a habit of poorer, less educated males.
- If actual prevalence remains, it is estimated that the number of male smokers worldwide will rise from 1 billion in 2000 to 1.4 billion in 2025.



Adult female

Current geographical distribution and rates of tobacco use among females:

- The tobacco epidemic started later among females. Currently, an estimated 22% of females in developed countries and 9% in developing countries smoke tobacco, totalling about 230 million females.
- In addition, many females in South Asia and the Pacific chew tobacco.
- The highest rates of tobacco use among females are recorded in Guinea, Myanmar, Nauru, Papua New Guinea, Tokelau, and Turkey.
- Cigarette smoking among females is declining in many developed countries, notably Australia, Canada, the United Kingdom, USA, and Australia. But this trend is not found in all developed countries: in several southern, central and eastern European countries cigarette smoking is either still increasing among females or has not shown any decline.
- As social traditions fade and incomes rise, the number of females smoking could double to 460 million by 2030.
- Arguably, the greatest public health challenge in primary prevention in the next 30 years will be to prevent a rise in smoking among girls and women in developing countries, especially in Asia.

THE SOCIAL AND ECONOMIC COSTS OF TOBACCO USE

The costs to individuals and their families

The costs to the individual smoker, and to non-smoking family members, include:

- loss of money spent on buying tobacco;
- loss of income through illness and premature death;
- health care costs induced by tobacco-related illnesses;

Unhealthy choices

- Bangladesh, China, Ghana, Moldova, Pakistan and Papua New Guinea, 2000: 20 imported cigarettes cost more than 50% of daily income.
- China, 1990: farmers near Shanghai spent more on cigarettes and wine than on grains, pork and fruits.
- Minhang, China, 1993: smokers spent on average 60% of their personal income and 17% of household income on cigarettes.
- Panama, 2000: one packet of imported cigarettes costs as much as 12 eggs.

Source: Scientific Committee on Tobacco and Health (2)



- the cost of the time spent by other family members looking after smokers or taking them to hospital (which may sometimes be measured in days in developing countries);
- the cost of illness or death in family members exposed to passive smoke in the home;
- higher health insurance premiums;
- miscellaneous costs, such as increased fire risk.

Smokers clearly perceive some benefit in smoking and are willing to pay for their tobacco. However, smokers' purchases can come at the expense of their families. In developing countries, where families have less available income, money spent on tobacco could be used instead for food, shelter, health care or other basic necessities (see Table 3).

Global evidence shows that smokers may not always be fully aware of the damage to health caused by smoking. Young smokers also tend to underestimate the power of nicotine addiction. When young smokers develop tobacco-related diseases, many often say they regret starting. The chronic diseases caused by tobacco require frequent use of the health care system, and are resource-intensive. The considerable costs of accessing this type of care can be a heavy economic burden on smokers and their families.

Smokers inflict direct costs on non-smokers, who risk several potentially disabling diseases as a result of exposure to tobacco smoke. When health care costs are partially or fully borne by government or private insurance, and the contributions to those institutions are shared by smokers and non-smokers alike, then smokers also impose an economic burden on society. The World Bank estimates that the gross costs of health care attributed to the extra health needs of smokers can range from 0.1% to 1.1% of gross domestic product in the high-income countries. There is less information available on low-income countries, but existing data indicate that the gross health care expenditure may be proportionately as high as in the developed countries.

The cost of tobacco for governments, employers and the environment

The economic burden of tobacco use on governments and societies can be summarized as follows.

- Social, welfare and health care costs: Governments often have to bear the burden of caring for chronically sick and terminally ill smokers, and providing for their spouses and children in the event of social incapacity or premature death.
- Loss of foreign exchange in importing cigarettes: In countries where tobacco is not grown or is insufficient to meet national demand, the importation of cigarettes could lead to a net loss of foreign currency.
- Loss of arable land that could be used to grow food.
- Higher costs for employers due to absence from work, decreased productivity, higher accident rates and higher insurance premiums: Absence from work is often higher among smokers due to illness. Smokers also take smoke breaks during



work, contributing to lower productivity. Some studies reveal a higher accident rate among smokers. Employers generally pay higher fire and accident insurance premiums in buildings where smoking is allowed. They also have to pay higher insurance premiums for health and life insurance policies for their employees who smoke. In addition, cleaning and maintenance cost more for buildings where smoking is permitted, adding to the burden borne by employers.

- The cost of fires and damage to buildings as a result of careless smoking.
- Environmental costs: The wood needed to cure tobacco and the paper used for cigarettes require cutting down large tracts of forest, contributing to deforestation. Cigarettes often start fires, causing massive environmental losses. For example, in 1987, cigarettes sparked off China’s worst fire in recent history, causing 300 deaths, destroying 1.3 million hectares of land and making 5000 people homeless (17, 18). It is estimated that every year, 1 million fires are started by children using cigarette lighters. Annual global estimates for 2000 indicate that smoking-related fires contributed to 10% of all fire deaths, and cost US\$ 27 billion in damages (19).

Unhealthy choices

- In 1994, Telecom Australia lost AU\$ 16.5 million from time off work due to tobacco-related illnesses.
- Workplace smoking costs the USA US\$ 47 billion each year.

Source: Mackay & Eriksen (15)

Table 3. Estimates of annual health care costs attributable to tobacco use, in US\$ (billions) (2002 or latest available estimates, selected countries)

Country	Health care costs (US\$ billions)
Australia	6.0
Canada	1.6
China	3.5
Germany	14.7
New Zealand	0.8
The Philippines	0.6
United Kingdom	2.3
USA	76.0

Source: Mackay & Eriksen (15)



Everyone pays for tobacco use

While the cost to the individual smoker is often obvious and accepted, in reality tobacco use costs everyone in society. Tobacco use leads to inefficient allocation of resources, justifying the need for government intervention to reduce tobacco consumption. Policy-makers need to become aware of the costs, as the rationale for instituting policies aimed at controlling tobacco use.

References

- Hirayama T. Non-smoking wives of heavy smokers have a higher risk of lung cancer: a study from Japan. *British Medical Journal*, 1981, 282:183–185.
- Great Britain Scientific Committee on Tobacco and Health (SCOTH). *Report of the Scientific Committee on Tobacco and Health*. London, The Stationary Office, 1998.
- International Consultation on Environmental Tobacco Smoke (ETS) and Child Health: Geneva, 11–14 January 1999*. Geneva, World Health Organization, 1999 (WHO/NCD/TFI/99.10).
- Guindon GE, Boisclair D. *Past, current and future trends in tobacco use*. Washington, DC, The World Bank, 2003 (Health Nutrition and Population Discussion Paper, Economics of Tobacco Control, paper no. 6).
- The world health report 2002: reducing risks, promoting healthy life*. Geneva, World Health Organization, 2002:65.
- Ezzati M, Lopez AD. Estimates of global mortality attributable to smoking in 2000. *Lancet*, 2003, 362 (9387):847–852 (http://www.thelancet.com/journal/vol362/iss9387/full/llan.362.9387.original_research.27132.1).
- Ezzati M, Lopez AD. Burden of disease attributable to smoking and oral tobacco use. Global and regional estimates for 2000 (in press).
- The world health report 2001*. Geneva, World Health Organization, 2001:31.
- Peto R. Education and debate – smoking and death: the past 40 years and the next 40. *British Medical Journal*, 1994, 309:937–939.
- International Consultation on Environmental Tobacco Smoke (ETS) and Child Health: Geneva, 11–14 January 1999*. Geneva, World Health Organization, 1999 (WHO/NCD/TFI/99.10).
- International Consultation on Environmental Tobacco Smoke (ETS) and Child Health: Global estimate of children aged 0–14 years exposed to ETS at home. Calculations by Dr A. Lopez: Geneva, 11–14 January 1999*. Geneva, World Health Organization, 1999.
- Barnum H. The economic burden of the global trade in tobacco. *Tobacco Control*, 1994, 3(4):358–361.
- The health consequences of smoking: nicotine addiction. A report of the US Surgeon General*. Maryland, United States Department of Health and Human Services, 1988.
- Smoking and health in China: 1996 National Prevalence Survey of Smoking Pattern*. Beijing, China Science and Technology Press, 1996:85.
- Mackay J, Eriksen M. *The tobacco atlas*. Geneva, World Health Organization, 2002:40–41.
- The Global Youth Tobacco Survey Collaborative Group. Tobacco use among youth: a cross country comparison. *Tobacco Control*, 2002, 11:252–270 (<http://www.tobaccocontrol.com/cgi/content/abstract/11/3/252>).
- Reuter. Sacked foreign minister was in the hospital during the blaze. *South China Morning Post*, 8 June 1987.
- Associated Press. Eleven face court after death fires. *South China Morning Post*, 14 June 1988:8.
- Leistikow BN, Martin DC, Milano CE. Fire injuries, disasters, and costs from cigarettes and cigarette lights: a global overview. *Preventive Medicine*, 2000, 31:91–99.

