

improved pesticide management by adopting an interdisciplinary 'agromedical' approach, and suggestions have also been made that a Caribbean poison center or a Caribbean pesticide surveillance unit should be established.

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Sources: Caribbean Epidemiology Center, *CAREC Surveillance Report* 12(1,2):1-9, 1986; and Pan American Health Organization, *Epidemiological Bulletin* 7(1):11-13, 1986.

# T TOBACCO USE AND WORLD HEALTH: A SITUATION ANALYSIS

## Diseases Caused by Tobacco Use

Tobacco smoking is a major avoidable cause of ill health and premature mortality in countries where it is widespread. It is responsible for about 90% of all lung cancer cases, 75% of all chronic bronchitis and emphysema cases, and 25% of all ischemic heart disease cases among men under 65 years old (1). An estimated one-third of all cancer cases are related to tobacco use.

Calculations indicate that at least one million premature deaths occur yearly worldwide because of tobacco use (2). In the United States, some 25% of all deaths can be attributed to the consequences of smoking, compared with 5% linked to alcohol and 2% to use of other addictive substances (3). Smoking-related diseases account for over 30% of all deaths in Cuba (4), and for about 15-20% in the United Kingdom (5-7). According to a report of the Royal College of Physicians, the extent of the problem is such that of 1,000 young male adults in England and Wales who smoke cigarettes, an average of one will be murdered, six will be killed on the roads, and 250 will die prematurely of tobacco-related diseases (7).

Despite repeated attempts by the tobacco industry and other vested interests to minimize as “only statistical” the evidence linking tobacco smoking to lung cancer and coronary heart disease, this evidence is overwhelming. It is based on thousands of independent publications resulting from studies of all kinds—prospective, retrospective, clinical, case-control, epidemiologic, and experimental—carried out in many countries (2). By comparison, environmental pollution—which is often pointed up by vested interests seeking to sidetrack attention from the smoking issue—is of secondary public health importance.

**Cardiovascular diseases.** A 1983 report of the United States Surgeon General on cardiovascular diseases (8) concluded that there were over three million premature deaths among Americans from heart disease attributed to cigarette smoking in 1965–1980, and that unless U.S. smoking habits changed, as many as 10% of all people then alive might die prematurely of heart disease attributable to their smoking. Similar trends are now appearing in many developing countries.

The influence of smoking is independent of, but also synergistic with, other risk factors such as hypertension and high serum cholesterol levels. The relative risk is greater at younger ages; the risk to the smoker increases with the amount smoked, but decreases with cessation of smoking until, some years later, it becomes almost the same as that of the lifelong nonsmoker. Cigarette smoking seems particularly important in causing peripheral artery diseases and sudden death from coronary heart disease, especially in men under 50 years of age.

It is sometimes argued that the urge to smoke and the diseases related to smoking are both due to a genetic predisposition with no causative relationship. Studies of smoking-discordant male twins, however, have shown that while psychological scores and life event scales were practically the same for the smoking and nonsmoking co-twins, the incidence of angina pectoris and myocardial infarction was significantly higher among the smoking co-twins, a finding which supports the conclusion that cigarette smoking is a causal factor in coronary heart disease (9).

**Cancer.** The worldwide use of tobacco, whether for smoking (10) or chewing (11), is cause-related to one-third of all cancers around the world (12). Prevention of tobacco use would therefore be one of the most cost-effective approaches to cancer control (12–14).

While cigarette smoking is implicated in many types of cancer, its responsibility is particularly striking for the great majority of lung cancer cases, the number of which has increased notably in all countries with reliable mortality statistics. This trend is not confined to industrialized countries but is present in the developing countries as well, and the evidence of a causal relationship is clear (1, 2, 15, 16). Overall, it has been estimated that 600,000 new cases of lung cancer occur worldwide every year, most of them due to smoking (11). By the year 2000 the yearly number of new lung cancer cases may be as high as two million (17). On cessation of smoking, however, the relative risk of a person's developing lung cancer de-

clines, slowly descending to almost the level of risk for the lifelong non-smoker (1).

Other uses of tobacco are also implicated in cancer. The habit of chewing tobacco and mixtures containing tobacco—which is widespread in southeast Asia—is responsible for 90% of all oral cancer cases (12). The chewing of tobacco and the use of snuff passed their peaks many decades ago in the industrialized countries, but a resurgence has occurred since the mid-1960s; and these habits, actively promoted by the tobacco industry, are becoming popular again. A working group convened in 1984 by the International Agency for Research on Cancer concluded that tobacco thus used, and not smoked, is carcinogenic in man (15).

**Acute and chronic respiratory diseases.** Cigarette smoking acts independently of, and synergistically with, the other risk factors contributing to non-neoplastic respiratory diseases. In developing countries it is now the most important cause of chronic bronchitis and is relatively much more important than atmospheric pollution or occupational exposure as a cause of bronchopulmonary diseases. For instance, smoking markedly increases the risk that miners and smelter workers will develop chronic bronchitis.

In purely economic terms, bronchitis is the most expensive of all the smoking-related diseases (1). Many of the conditions that gave rise to widespread bronchitis in nineteenth century England are occurring now in developing countries: poor social conditions in urban areas, poor nutrition, overcrowding leading to the spread of respiratory infections, and uncontrolled atmospheric pollution arising from rapid industrialization. Hence, a large increase in bronchitis-related morbidity and mortality is probably inevitable if urgent steps are not taken to reduce smoking as much as possible.

**Other diseases and adverse effects on health.** Other diseases and disease manifestations caused or aggravated by tobacco use include oral and bladder cancers, cancers of certain other sites, peripheral vascular diseases, gastric ulcers, dental diseases, subarachnoid hemorrhages, and complications of pregnancy. Recent evidence also suggests that the consequences of smoking are particularly deleterious to reproductive health (18). Indeed, smoking affects contraception and fecundity, pregnancy, birth outcomes, lactation, early childhood development, and development of cancers of the reproductive system among both men and women. For example, the risk of myocardial infarction among women using oral contraceptives is 10 times greater among smokers than among nonsmokers (19). Recent studies reflect an increased risk of spontaneous abortion, fetal death, and perinatal death directly paralleling the mother's level of smoking during pregnancy. They also indicate a 20% increase in the perinatal death rate for children of women who smoke less than one pack a day, and a 35% increase in the rate for children of women who smoke more than that amount. Studies have also consistently

shown that smoking during pregnancy is associated with a more than twofold increase in the proportion of small-for-date babies (< 2,500 g), the proportion increasing with the number of cigarettes smoked (1, 19).

Deaths and property losses are also caused indirectly by smoking. In the United States alone, some 65,000 fires in residential accommodations, resulting in about 2,000 deaths and 5,000 burn casualties, are caused each year by careless smoking, mainly of cigarettes (20, 21).

**Passive smoking.** While the disease effects described above are often well-recognized for the direct consumer, insufficient attention has been given to what is known as "passive" smoking, i.e., smoking "forced" on others. In this connection, studies suggest that the lung cancer risk among nonsmoking wives of smokers is higher than that of nonsmoking wives of nonsmokers (22, 23). Early signs of impairment of small airways function have been detected in nonsmokers continually exposed to passive smoking in the workplace (24). Smoking by parents has been found to increase the incidence of acute respiratory infections in small children—for instance, the risk of an infant developing bronchitis or pneumonia in its first year of life is doubled if its parents smoke (2). And more generally, the elderly, children, and cardiac, asthmatic, or hypersensitive subjects can be adversely affected by smoke produced in their vicinity.

## Tobacco Production

Tobacco is produced in about 120 countries around the world. The contribution of developing countries to world tobacco production increased from some 50% in 1963 to 63% in 1983. The major tobacco producing and consuming countries are China, the United States of America, the Union of Soviet Socialist Republics, India, and Brazil (25).

A small number of large enterprises are responsible for manufacturing operations throughout the world. (Table 1 shows the upward trend in worldwide cigarette production.) About 37% of

TABLE 1. Average annual cigarette production in billions (10<sup>9</sup>), by geographic area, in 1971–1982.

Area	1971–1975	1976	1977	1978	1979	1980	1981	1982	Overall increase (%)
Africa	105	123	131	137	141	150	151	154	46.7
America, North	760	844	824	855	871	883	907	864	13.7
America, South	181	214	228	237	242	248	235	229	26.5
Asia	1,326	1,472	1,527	1,539	1,588	1,620	1,770	1,827	37.8
Europe	1,287	1,376	1,391	1,414	1,430	1,457	1,461	1,463	13.7
Oceania	36	37	40	40	40	42	42	42	16.7
Total	3,695	4,066	4,141	4,222	4,312	4,400	4,566	4,579	23.9

Source: Commonwealth Secretariat, *Tobacco Quarterly*, No. 3, 1984.

the world's cigarettes are produced by state-controlled industries in centrally planned countries, and a further 17% are manufactured by state monopolies whose aim is to maximize government revenue. The remainder of the market is dominated by seven international conglomerates which, although primarily interested in tobacco, have diversified widely into other manufacturing sectors or trading enterprises. On a short-term basis, tobacco production is of tangible economic significance to many producing countries (25). It provides jobs and income to tens of thousands of families engaged in tobacco growing, manufacturing, and trade. It provides revenue to a flourishing advertising industry, tax revenue to governments, and foreign currency to nations short on foreign exchange. Some developing countries—such as Brazil, Malawi, the United Republic of Tanzania, and Zimbabwe—rely heavily on tobacco-generated income.

It should be pointed out, however, that most of the profits from tobacco go to the transnational tobacco companies rather than to the local producers. According to the United Nations Conference on Trade and Development, “the developing countries are totally at the margin in the marketing decision process. They gain only an insignificant share of the total profit made from tobacco-growing because their aggregate receipts from the tobacco industry are based, almost exclusively, on the demand response and the marketing decisions determined by the transnational tobacco companies” (26).

Also, the adverse effects of tobacco cultivation on the availability of food are well-documented. Smokers worldwide spend between US\$85 and US\$100 billion annually to buy four trillion ( $10^{12}$ ) cigarettes, or more than 1,000 cigarettes for every man, woman, and child (27). When land or labor is scarce, tobacco cultivation reduces the resources available for food production. Similarly, to the extent that cash is spent on buying tobacco, correspondingly less is likely to be applied to the purchase of food, and so the nutritional status of the poor will decline. Reduced local food production may also lead to higher prices, which will penalize even nonsmoking families. And, because tobacco provides ready cash, food crops such as rice in Nigeria tend to become a second choice for cultivation. The net result of such displacement of a staple food crop is that food has to be imported (28).

It is true that the tobacco exported from a developing country generates valuable foreign exchange. If, however, most of the tobacco produced is consumed in the country of origin, the expected benefits are reduced by this loss of export earnings and by the costs of damaged health. In addition, the increased popularity of imported cigarettes may entail a huge drain on foreign currency.

## Worldwide Trends in Tobacco Use

As the foregoing suggests, addiction to smoking is spreading throughout the world. Starting as a predominantly

**TABLE 2. Per capita consumption of manufactured cigarettes in 110 countries and territories in 1982.**

Country or territory	Consumption per capita	Country or territory	Consumption per capita
Cyprus	3,117	Jordan	867
Greece	2,927	Algeria	861
Cuba	2,857	Belize	850
Canada	2,797	Chile	847
United States	2,678	Nicaragua	846
Spain	2,658	Albania	786
Japan	2,636	Barbados	785
Hungary	2,570	Tunisia	768
Poland	2,517	Korea, Democratic People's Rep. of	713
Bulgaria	2,472	Guyana	656
Australia	2,340	Jamaica	650
Yugoslavia	2,323	Dominican Republic	614
New Zealand	2,305	Thailand	605
Switzerland	2,171	Panama	599
Austria	2,111	Indonesia	577
Belgium-Luxembourg	2,055	Iraq	574
Singapore	1,961	Honduras	563
Hong Kong	1,957	Norway	556
Lebanon	1,926	Morocco	537
Germany, Federal Republic	1,867	Congo	531
Italy	1,854	Paraguay	521
United Kingdom	1,818	El Salvador	508
Czechoslovakia	1,812	Ecuador	508
German Democratic Republic	1,796	Senegal	448
Ireland	1,778	Viet Nam	424
Korea, Republic of	1,747	Ivory Coast	422
Union of Soviet Socialist Republics	1,715	Sierra Leone	419
Libyan Arab Jamahiriya	1,688	Pakistan	396
Israel	1,656	Angola	375
Netherlands	1,652	Iran, Islamic Republic of	364
Denmark	1,636	Sri Lanka	341
France	1,608	Guatemala	325
Romania	1,593	Zimbabwe	319
Sweden	1,543	Haiti	316
Taiwan	1,531	Kenya	283
Portugal	1,428	Zambia	223
Philippines	1,371	Mozambique	221
Trinidad and Tobago	1,318	Ghana	218
Turkey	1,305	Peru	216
Uruguay	1,241	Lao People's Democratic Republic	209
Malaysia	1,222	Bolivia	206
Mauritius	1,215	Malawi	197
Finland	1,148	United Republic of Tanzania	181
Argentina	1,136	Cameroon	175
Venezuela	1,089	Bangladesh	170
Brazil	1,051	Uganda	146
Syrian Arab Republic	1,049	India	141
Democratic Yemen	1,038	Zaire	129
South Africa	1,002	Cape Verde	117
Fiji	986	Nigeria	98
Suriname	975	Nepal	83
China	900	Burma	71
Colombia	873	Ethiopia	48
Egypt	872	Sudan	37
Costa Rica	868	Equatorial Guinea	17

Source: *Journal of the American Medical Association* 252(1):24, 1984.

male phenomenon in the industrialized countries, smoking is now practiced by women and young people in those countries and by many in the developing world, where cigarette smoking is now the predominant form of tobacco use. (Indigenous forms of tobacco smoking and chewing are also widespread in many developing countries, where the materials smoked or chewed are usually even more noxious than those used in the developed countries and yield much higher levels of toxic components, particularly tar and nicotine.)

Poor housing and environmental conditions, malnutrition, the absence or inadequacy of legislative measures to control tobacco promotion and use, and a lack of public education and information about the dangers of tobacco make the populations in developing countries especially susceptible to the mounting epidemic of tobacco-related diseases. At present, cigarette consumption per capita in most of the developing countries is much lower than in the affluent countries (Table 2), but the prevalence of smoking is higher than in the developed countries, where intensive and sustained education and information action has brought about significant decreases in the number of smokers. It should be noted, however, that the number of manufactured cigarettes consumed may not provide an accurate picture of the intensity of smoking in certain developing countries where the use of bidis and home-grown tobacco is widespread.

Many governments will act with great speed when pharmaceutical products or food additives are merely suspected of harmful health consequences that might entail only a remote chance of producing such adverse effects as cancer. This is in marked contrast to common government reluctance to act on tobacco, which is demonstrably a cause of avoidable disease and death on a scale unmatched by any other currently available product for human consumption (2). The message is clear: In the absence of strong and resolute government action, we face the serious probability that the damage done by the smoking epidemic will have started to take effect in the developing world within a decade, and that a major avoidable public health problem will have been inflicted on the countries least able to deal with it as a result of unscrupulous commercial enterprise and government inactivity. Smoking diseases will appear in developing countries before communicable diseases and malnutrition have been controlled, and thus the gap between rich and poor countries will widen further (2).

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## PAHO ESTABLISHES A NONSMOKING POLICY

PAHO, which has been working aggressively to assist its Member Governments with smoking control strategies, established a nonsmoking policy on all Organization premises—at Headquarters, all field offices, and all centers—in February 1986. This policy was supported by a subsequent educational workshop for headquarters staff members.

The workshop, which concentrated on the health hazards of smoking, took place on 14 May. It featured presentations on the subjects of smoking and cancer; tobacco, heart disease, and hypertension; the health hazards of passive smoking; smoking control strategies; and ways to stop smoking. Those addressing the workshop included PAHO's Director, Dr. Carlyle Guerra de Macedo; Dr. Jorge Litvak, Coordinator of PAHO's Health of Adults Program; Dr. Joseph Cullen of the U.S. National Cancer Institute; Mr. Mario Martínez Palacios of the American Cancer Society; and Dr. Jorge Rios, Chairman of the Department of Internal Medicine at George Washington University.

This gathering afforded PAHO staff members an opportunity to ask questions, form their own opinions, and become sensitized to the health versus smoking issue. This sensitization process was important, for it was felt that in order for PAHO's new internal policy on smoking to work well, full understanding and cooperation by virtually all staff members would be required.