Tobacco Use and Its Impact on Health
Tabaco: mortífero en todas sus formas

EL TABACO CAUSA 5 MILLONES DE MUERTES ANUALES
PODRÍA OCURRIRTE A TÍ.

31 de Mayo Día Mundial Sin Tabaco

Organización Mundial de la Salud
3. Prevalence of Tobacco Use and Factors Influencing Initiation and Maintenance Among Women

Introduction

Tobacco consumption has fallen substantially over the past 30 years in many industrialized countries as a result of increasing awareness of the hazards of tobacco use and the implementation of aggressive and effective tobacco control policies. In contrast, over the same time period, tobacco consumption has been increasing in the developing world; developing nations now consume the greatest share of the world’s cigarette production. Just as global tobacco consumption is shifting between industrialized and developing countries, the tobacco pandemic is spreading to women in a variety of settings. Historically, smoking by women in industrialized countries increased during the last century, lagging behind the rise in men by about 20 to 30 years. This rise among women can be attributed to weakening social, cultural, and political constraints, coupled with women’s earning power and targeted marketing by tobacco companies. Today, the prevalence of smoking among women in some countries remains high, while surveillance data from other countries provide warning of increasing use among youth, particularly girls.

This chapter discusses the prevalence of tobacco use among women and girls and explores the factors that influence the initiation and maintenance of their tobacco use. The factors that motivate women to continue smoking are quite different from those that encourage young girls to start. Factors driving initiation are complex and varied, not only between industrialized and developing countries, but also between different groups within a country. Maintenance of tobacco use results from nicotine addiction, lack of awareness of risk, and difficulty in quitting, which is driven by diverse psychosocial and environmental factors, as well as dependence.

In many countries, manufactured cigarettes are the predominant form of tobacco used by both men and women. For this reason, much of the available prevalence data focuses on cigarette smoking. However, in some countries, e.g. India and Indonesia, chewing tobacco and other smoked products (e.g. bidis, kreteks, and water pipes) are used by many women. We use case-studies of particular countries to highlight women’s use of smokeless tobacco and other tobacco products. The predominance of examples of initiation and maintenance in industrialized countries is not deliberate but is a reflection of the more limited research in developing countries. The types of influences and their importance in shaping youth behaviour in the industrialized world are likely to differ from those in developing countries, depending on social and cultural norms, socioeconomic conditions, and the political context of a country. Where available, representative studies from developing countries are used in this chapter to highlight potential similarities and differences in factors that influence young people to take up smoking.

Prevalence and Trends

Prevalence of Smoking

In 2006, more than 1 billion smokers in the world consumed about 5.7 trillion cigarettes. An additional 700 billion bidis are consumed annually in India alone. There is wide variation in smoking prevalence among both males and females from one region to another. Globally, the prevalence of smoking is higher for men (40% in 2006) than for women (nearly 9% in 2006), and males account for 80% of all smokers (nearly 1 billion).

Table 3.1 provides regional estimates of smoking prevalence in 2006. In the Americas and Europe, the prevalence of female smoking is high, around 17% and 22%, respectively. The disparity between male and female smoking prevalence is greater in other regions of the world. For example, male smoking prevalence is near 37% in South-East Asia and 57% in the Western Pacific, while prevalence among women is around 4% to 5%. These patterns reflect differing social norms, cultural traditions,
and demographic factors. Socioeconomic influences must also be considered.

Recent global estimates of smoking prevalence by age group are limited. The trends in smoking prevalence by age are always dynamic and reflect a combination of age, period, and cohort effects. In most settings, smoking initiation usually occurs during adolescence, and prevalence increases until early or middle adulthood, beyond which smoking declines with age. This decline with age reflects the cumulative impact of smokers quitting and smokers dying prematurely over time. Trends by age within a country are based on changes in the rate and age of initiation and patterns of smoking cessation, which change over time as a result of the interplay between pro-tobacco and anti-tobacco forces.

In addition to differences in prevalence by gender and age group, there is significant variation by income status. As seen in Table 3.2, the majority of the world’s smokers (81%) are in low- and middle-income countries. Smoking prevalence among males in middle-income countries (45%) is higher than that among males in high-income countries (32%), while the reverse is true for females (7% in middle-income countries and 18% in high-income countries). These data may be affected by some underreporting of smoking among women, particularly in countries where it is socially and culturally unacceptable for women to smoke.

A generally consistent finding is that rates of both daily and current smoking are higher among men than among women, as shown in Table 3.3. However, there is considerable variation among countries. In some countries, such as the United States and the United Kingdom, the rates among men and among women are nearly equal, and in some, such as Sweden, the rates among women are even higher than those among men. In some Asian countries, only a small percentage of women smoke, while the majority of men are smokers. These differences reflect different stages of the smoking epidemic in each country, as well as the influence of social norms, cultural traditions, and socioeconomic and demographic factors.

In addition to the generally lower prevalence of smoking among women, women tend to smoke fewer cigarettes per day than men. Table 3.4 presents estimates of the number of cigarettes smoked per day by male and female smokers in a sample of countries. These data are compiled from various sources, using different survey designs and

<table>
<thead>
<tr>
<th>WHO Region</th>
<th>Smoking Prevalence (%)</th>
<th>Total Smokers (millions)</th>
<th>% of All Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Overall</td>
</tr>
<tr>
<td>African Region (AFR)</td>
<td>16</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Region of the Americas (AMR)</td>
<td>27</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Eastern Mediterranean Region (EMR)</td>
<td>30</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>European Region (EUR)</td>
<td>44</td>
<td>22</td>
<td>32</td>
</tr>
<tr>
<td>South-East Asia Region (SEAR)</td>
<td>37</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>Western Pacific Region (WPR)</td>
<td>57</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td>World / Total</td>
<td>40</td>
<td>9</td>
<td>24</td>
</tr>
</tbody>
</table>


* These estimates are not age-standardized (i.e. the effects of the underlying age structures across countries are not removed) and should be used with caution when making comparisons of smoking prevalence across regions. For this reason, these estimates differ to those published in WHO’s World Health Statistics Report, 2010.

b All estimates have been rounded off.
smoking definitions, but they indicate the differences in smoking behaviour between men and women.

Differences in smoking prevalence between young male and female smokers are less evident. Data from the Global Youth Tobacco Survey (GYTS) for 13- to 15-year-old students suggest a similar pattern of smoking among boys and girls in many areas of the world. Table 3.5 shows the prevalence of cigarette and other tobacco-product use by sex and region. The GYTS data presented include 29 Member States in AFR (19 national and 10 subnational); 34 Member States and four territories in AMR (25 national and 13 subnational); 21 Member States and two geographical regions in EMR (17 national and six subnational); 28 Member States and one United Nations administered province in EUR (28 national and one subnational); 10 Member States in SEAR (eight national and two subnational); and 18 Member States, two territories, one special administrative region, and one commonwealth in WPR (19 national and three subnational). Although boys are significantly more likely than girls to smoke cigarettes in AFR, EMR, SEAR, and WPR, significant differences were not observed by gender in AMR and EUR. Boys were found to be significantly more likely than girls to use other tobacco products overall and in AMR, EUR, and SEAR; however, significant differences by gender were not observed in AFR, EMR, or WPR.

No differences in cigarette smoking by gender were observed in more than half (87) of the 151 sites where the GYTS was conducted from 2000 to 2007. The potential increase in female youth smoking raises great concern for the future burden of tobacco use and tobacco-related disease among women.

**Trends in Smoking Prevalence**

Fortunately, tobacco consumption has fallen over the past several decades in many industrialized countries. Consumption among men peaked around 1970 in many countries, but patterns over time among women have been more variable. In the United States, the prevalence of smoking increased steadily between the 1930s and 1964, when more than 40% of all adult Americans smoked. Since then, smoking prevalence has decreased, and it dropped below 20% in 2007 (22% in men, 17% in women). In Japan, smoking prevalence was highest in 1966, when the proportions of adult male and female smokers reached 84% and 18%, respectively. By 1996, the proportions had declined to 59% and 15%. In 2004, smoking prevalence in Japan was down to 39.9% among men and 10% among women. In the United Kingdom, cigarette smoking prevalence fell from 51% in men and 41% in women in 1974 to 23% and 21%, respectively, in 2006.

In contrast, cigarette consumption per capita increased in developing countries at a rate of about 3.7% per annum between 1970 and 2000, almost 10 times the

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**Table 3.2. Smoking Prevalence by Socioeconomic Status, Sex, and Number of Smokers Age 15 or Older, 2006**

<table>
<thead>
<tr>
<th>Income Group</th>
<th>Smoking Prevalence (%)</th>
<th>Total Smokers (millions)</th>
<th>% of All Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Overall</td>
</tr>
<tr>
<td>High</td>
<td>32</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Middle</td>
<td>45</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>Low</td>
<td>28</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>9</td>
<td>24</td>
</tr>
</tbody>
</table>


These estimates are not age-standardized (i.e. the effects of the underlying age structures across countries are not removed) and should be used with caution when making comparisons of smoking prevalence across regions. For this reason, these estimates differ from those published in WHO’s World Health Statistics Report, 2010.

All estimates have been rounded off.
Table 3.3. Prevalence of Daily and Current Tobacco Smoking in Adult Men and Women in Selected Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Daily smoking (%)</th>
<th>Current smoking (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td><strong>African Region (AFR)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>2003</td>
<td>19</td>
<td>10.3</td>
</tr>
<tr>
<td>Chad</td>
<td>2003</td>
<td>13.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Côte d’lvoire</td>
<td>2003</td>
<td>14.5</td>
<td>1.2</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2003</td>
<td>5.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Ghana</td>
<td>2003</td>
<td>6.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Kenya</td>
<td>2004</td>
<td>21.2</td>
<td>0.9</td>
</tr>
<tr>
<td>Uganda a</td>
<td>2000–2001</td>
<td>25.2</td>
<td>3.3</td>
</tr>
<tr>
<td>South Africa</td>
<td>2003</td>
<td>31.7</td>
<td>9</td>
</tr>
<tr>
<td><strong>Region of the Americas (AMR)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina b</td>
<td>2005</td>
<td>26.2</td>
<td>18.6</td>
</tr>
<tr>
<td>Brazil</td>
<td>2008</td>
<td>17.3</td>
<td>11</td>
</tr>
<tr>
<td>Chile</td>
<td>2006</td>
<td>29.7</td>
<td>26.3</td>
</tr>
<tr>
<td>Canada b</td>
<td>2007</td>
<td>16.4</td>
<td>14.3</td>
</tr>
<tr>
<td>Mexico b</td>
<td>2006</td>
<td>21.6</td>
<td>6.5</td>
</tr>
<tr>
<td>Paraguay</td>
<td>2003</td>
<td>23.5</td>
<td>6.5</td>
</tr>
<tr>
<td>United States</td>
<td>2007</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Uruguay</td>
<td>2006</td>
<td>37.2</td>
<td>28.6</td>
</tr>
<tr>
<td>Venezuela (Bolivarian Republic of)</td>
<td>2005</td>
<td>20.9</td>
<td>13</td>
</tr>
<tr>
<td><strong>Eastern Mediterranean Region (EMR)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>2005</td>
<td>22.9</td>
<td>0.3</td>
</tr>
<tr>
<td>Iran (Islamic Republic of)</td>
<td>2005</td>
<td>20.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2002–2003</td>
<td>27.3</td>
<td>4.4</td>
</tr>
<tr>
<td>Tunisia</td>
<td>2005–2006</td>
<td>53.1</td>
<td>6.6</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>2003</td>
<td>17.6</td>
<td>1.4</td>
</tr>
<tr>
<td><strong>European Region (EUR)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>2004</td>
<td>40.2</td>
<td>35.5</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>2003</td>
<td>46.6</td>
<td>24.9</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2008</td>
<td>26.1</td>
<td>19.3</td>
</tr>
<tr>
<td>Denmark</td>
<td>2008</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>France</td>
<td>2005</td>
<td>28.2</td>
<td>21.7</td>
</tr>
<tr>
<td>Germany</td>
<td>2005</td>
<td>27.9</td>
<td>18.8</td>
</tr>
<tr>
<td>Hungary</td>
<td>2003</td>
<td>38.6</td>
<td>27.7</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>2003</td>
<td>38.7</td>
<td>5.8</td>
</tr>
<tr>
<td>Norway</td>
<td>2007</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td>Poland</td>
<td>2007</td>
<td>34</td>
<td>23</td>
</tr>
<tr>
<td>Russian Federation a</td>
<td>2001</td>
<td>60.4</td>
<td>15.5</td>
</tr>
<tr>
<td>Spain</td>
<td>2006</td>
<td>32</td>
<td>22</td>
</tr>
</tbody>
</table>
By 2005, developing countries accounted for approximately 70% of world cigarette consumption. The ratio of average cigarette consumption per adult between industrialized and developing countries narrowed from 3.3 in the early 1970s to 1.8 in the early 1990s.

Just as the gap in cigarette consumption has narrowed between industrialized and developing countries, it is clearly narrowing between men and women. The tobacco pandemic is reaching men and women equally as multinational tobacco companies expand their focus from men in high-income countries to men in developing countries and women in both industrialized and developing countries. At the same time, the divide between socioeconomic groups is broadening. In areas where women have been smoking for several decades, the relationship between socioeconomic status (SES) and smoking in women is similar to that seen in men. In most high-income countries, there are significant differences in smoking prevalence between different socioeconomic groups. In the United Kingdom in 2006, for example, only 14% of women and 17% of men in the highest socioeconomic groups were smokers, in contrast to 28% and 32%, respectively, in the lowest socioeconomic groups. In a sample of nine Western European countries, between 1985 and 2000, smoking prevalence and/or consumption decreased more rapidly, on average, among the more highly educated than among the less-educated. The gap was greatest among women.

Note: All surveys were conducted among adults, but age groups and survey methodologies varied.

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Daily smoking (%)</th>
<th>Current smoking (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td><strong>Sweden</strong></td>
<td>2007</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td><strong>Switzerland</strong></td>
<td>2007</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td><strong>Turkey</strong></td>
<td>2006</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Ukraine</strong></td>
<td>2005</td>
<td>62.3</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>United Kingdom</strong>a</td>
<td>2007</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

**South-East Asia Region (SEAR)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Daily smoking (%)</th>
<th>Current smoking (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td><strong>Bangladesh</strong></td>
<td>2004</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>India</strong>a</td>
<td>2005–2006</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Indonesia</strong></td>
<td>2007</td>
<td>46.8</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Myanmar</strong></td>
<td>2003</td>
<td>35.6</td>
<td>10.4</td>
</tr>
<tr>
<td><strong>Sri Lanka</strong></td>
<td>2003</td>
<td>24.5</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>Thailand</strong></td>
<td>2007</td>
<td>36.6</td>
<td>1.6</td>
</tr>
</tbody>
</table>

**Western Pacific Region (WPR)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Daily smoking (%)</th>
<th>Current smoking (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td><strong>China</strong>b</td>
<td>2002</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td><strong>Japan</strong></td>
<td>2006</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td><strong>Malaysia</strong></td>
<td>2006</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td><strong>New Zealand</strong></td>
<td>2007</td>
<td>19.3</td>
<td>17</td>
</tr>
<tr>
<td><strong>Philippines</strong></td>
<td>2003</td>
<td>40.3</td>
<td>7.1</td>
</tr>
<tr>
<td><strong>Singapore</strong>b</td>
<td>2007</td>
<td>22.8</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Viet Nam</strong></td>
<td>2003</td>
<td>34.8</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Note: All surveys were conducted among adults, but age groups and survey methodologies varied.

a The difference cannot be calculated, because the age range for males differs from that for females.
b Cigarette smoking.
c Cigarette or bidi smoking.

Source: Ref. 1. See Ref. 1 for more detail on data sources and smoking prevalence in other countries.
in women is highest among the highly educated, more urban, and least economically deprived.\textsuperscript{17,19}

The historical trajectories of tobacco use among men and women reflect different sociocultural motivating and constraining forces, which have acted to determine tobacco use patterns among women. The constraints against smoking have weakened in many countries, and smoking prevalence among women has risen, often accelerated by marketing campaigns targeted directly at girls and women. In some countries, the prevalence of smoking among girls and women is still rising. In Spain, the prevalence of cigarette smoking among women remained low after the Second World War, because of traditional norms reinforced by the government. A dramatic increase was observed after the democratization of Spain in the 1970s, which allowed the entry of the multinational tobacco industry and large increases in cigarette marketing expenditures.\textsuperscript{29} Among 21- to 30-year-olds, the prevalence of cigarette smoking increased from 9.4% in 1970, to 31.9% in 1980, to 49.9% in 1990.\textsuperscript{30} The rapid increase in cigarette smoking in Spain provides a warning about the impact of aggressive tobacco marketing in the context of increasing education, liberalization, and economic prosperity of women.\textsuperscript{29} This pattern, which has been seen in many industrialized countries throughout the 20th century, seems likely to be repeated in developing countries during the present century unless effective tobacco control measures are implemented.

\textbf{Case-Study: Tobacco Use in India}

India provides a case-study of the challenges of controlling tobacco use in a population that uses...
numerous types of tobacco products. These products include smoked tobacco, such as bidi and chutta, and chewed tobacco, such as khaini, mawa, and betel quid. The prevalence of smoking and chewing differs widely by region of the country.\(^{31,32}\) In general, men both smoke and chew tobacco, whereas women generally only chew tobacco, except in a few areas where the prevalence of smoking among women is high. In the coastal areas of Andhra Pradesh and Orissa, women smoke cheroots (cigars, also called chutta) in a reverse manner (i.e. with the burning end inside the mouth), and in some northern parts of the country, many women smoke hookah or hubble bubble.\(^{32}\) Table 3.6 shows the prevalence of different forms of tobacco use among adult men and women in urban and rural areas of India. Rural men and women are more likely to smoke and chew tobacco than are their urban counterparts. Additionally, women are more likely to chew tobacco than to smoke cigarettes or bidis. The prevalence of tobacco use is only slightly lower among pregnant women than in the general population of reproductive age, suggesting a lack of awareness of the potential harm of tobacco use on the part of these women, their families, and their healthcare providers.

The prevalence of tobacco use by women increases with age. In 2005–2006, the reported prevalence of tobacco use was 3.5% among 15- to 19-year-olds, 9.1% among 20- to 34-year-olds, and 18.3% among 35- to 49-year-olds.\(^{33}\) Results from the 2006 GYTS show that 1.6% of 13- to 15-year-old female students smoke cigarettes, and another 8.5% use other tobacco products. Further, among girls who were ever-smokers, more than half began before age 10.\(^{34,35}\) It should be noted, however, that survey methodologies,

**Table 3.5. Prevalence of Tobacco Use by Boys and Girls by Gender and WHO Region**

<table>
<thead>
<tr>
<th>Region</th>
<th>% Currently smoked cigarettes</th>
<th>% Currently used tobacco products other than cigarettes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>African Region (AFR)</td>
<td>13.5</td>
<td>5.2</td>
</tr>
<tr>
<td>Region of the Americas (AMR)</td>
<td>13.5</td>
<td>15</td>
</tr>
<tr>
<td>Eastern Mediterranean Region (EMR)</td>
<td>7.3</td>
<td>2</td>
</tr>
<tr>
<td>European Region (EUR)</td>
<td>21</td>
<td>17.4</td>
</tr>
<tr>
<td>South-East Asia Region (SEAR)</td>
<td>9.5</td>
<td>2</td>
</tr>
<tr>
<td>Western Pacific Region (WPR)</td>
<td>18.5</td>
<td>8.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12.1</td>
<td>6.8</td>
</tr>
</tbody>
</table>

Note: These data are from a subset of countries in each region. For details concerning how the data were aggregated, see Ref. 22.

\(^a\) Smoked on at least one day during the month preceding the survey.

\(^b\) Used tobacco products other than cigarettes on at least one day during the month preceding the survey.

\(^c\) Significant differences.

Figure 3.1. Tobacco Use Among Men and Women Ages 15–49 in India by Level of Wealth

Source: Ref. 33.
smoking definitions, and target populations differ between studies, limiting the ability to make comparisons.

There is also a strong socioeconomic element in tobacco use in India. Figure 3.1 shows that among both men and women, there is a clear inverse relationship between level of wealth and prevalence of tobacco use. A similar relationship is observed when education is used as the measure of SES. These data indicate a need for targeted efforts with effective programmes and policies to reach the lowest-income and most-vulnerable populations. There is also considerable variation in tobacco use by members of different religions, with Sikhs and Jains reporting the lowest prevalence.

The tobacco profile of women in rural India is varied. In general, female tobacco users in rural India are housewives or farmers working in the fields, and their literacy levels are low. The main reasons for starting to use tobacco in various forms include accepted sociocultural norms, beliefs, and use as a medicinal aid (e.g. to cure toothaches or during labour). For example, women in Kerala tend to chew tobacco with betel leaf and areca nut. These women are full-time housewives who also work in the fields, growing, tending, and harvesting paddy. The literacy rate in Kerala is higher than in most parts of India, and in addition, the women are independent, have their private supplies of chewing tobacco, and indulge whenever they want to. Their counterparts in Andhra Pradesh are poorer and less literate, and those who do not chew tobacco smoke chutta.

Although the prevalence of tobacco use among women in India is relatively low, there are many users given the country’s large population. Further, there is concern about an increase in the prevalence of smoking among urban women, with increasing independence, modernization, and purchasing power and a decrease in the cultural pressures constraining tobacco use. In the past, the tobacco industry has aggressively exploited the image of the emancipated woman to increase sales.31

Because of the high prevalence of tobacco use and the manner in which it is used, tobacco poses a large burden of morbidity and mortality in India. It has been estimated that 20% of deaths among men and 5% of deaths among women between the ages of 30 and 69 are caused by smoking. Recent estimates indicate that by 2010, almost 1 million adult deaths per year of people between the ages of 30 and 69 in India will be caused by smoking.36

### Case-Study: Tobacco Use in Singapore

Singapore offers a case-study of a country with a well-established tobacco control programme and a smoking prevalence that is relatively low among high-income countries. Singapore has been a leader in tobacco control policy. It was the first country to implement a tobacco advertising ban, which it did as early as 1970. Legislation that followed included protection from exposure to tobacco smoke, rotating and graphic health warnings, cessation policies for youth, and public education campaigns.1

A recent national survey showed that since the start of Singapore’s National Smoking Control Programme in 1986, there has been an overall decrease in smoking prevalence from 20% in 1984, to 15% in 1998, to 14% in 2007.37,38 Of concern is the plateau in smoking prevalence among females and an increase in smoking by young

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### Table 3.6. Tobacco Use Among Men And Women Ages 15–49 in India, 2005–2006

<table>
<thead>
<tr>
<th>Tobacco Type</th>
<th>Women (%)</th>
<th>Men (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Cigarettes/bidis</td>
<td>0.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Chewing tobacco (paan masala, gutkha, other)</td>
<td>5.5</td>
<td>9.8</td>
</tr>
<tr>
<td>Any tobacco use</td>
<td>6.7</td>
<td>12.9</td>
</tr>
</tbody>
</table>

Source: Adapted from Ref. 33.
women 20 to 24 years of age in recent years.\textsuperscript{37} The decrease observed in overall smoking prevalence since 1986 is largely due to a decrease in male smoking, as female smoking prevalence increased from 3\% in 1984 to 4\% in 2007.\textsuperscript{37,38} In particular, between 1992 and 1998, there was a significant increase in the prevalence of smoking among 20- to 24-year-old women, according to National Health Survey data: from 2.5\% in 1992 to 6.7\% in 1998.\textsuperscript{37} Table 3.7 presents a summary of the trends in smoking prevalence among 18- to 69-year-olds in Singapore.

The reason for the increase in smoking prevalence among young women is unclear; however, the Ministry of Health has responded to it by targeting smoking cessation efforts at young women.\textsuperscript{39} Recent GYTS data indicate that smoking prevalence among 13- to 15-year-old girls is 7.5\%, and prevalence among boys is 10.5\%.\textsuperscript{22} Morrow and Barraclough\textsuperscript{40} suggest that recent changes in smoking among young women and the small difference in smoking prevalence between young men and young women may be the result of shifting social dynamics in Singapore. The significance of gender is not recognized in tobacco control policies and programmes, since Singapore is a country where policies are gender-neutral. Increased attention is needed to trends among women to avoid the uptake of smoking seen in Western countries with the attainment of social and economic equality.

Another trend of concern in Singapore is the educational gradient reported in the most recent National Health Survey: as daily smoking prevalence has increased, the level of education has decreased for both men and women 18 to 69 years of age. Similar to trends in other countries, less-educated men are 12.6 times more likely to smoke daily than the most-educated cohort, and less-educated women are 8.8 times more likely.\textsuperscript{41}

Despite Singapore’s achievements in tobacco control policies and programmes, the changing prevalence among young women is cause for concern. The case-study of Singapore shows the need for continued monitoring of changing patterns of tobacco use, even after decades of success in tobacco control, and the need for responses to unfavourable trends.

### Initiation of Tobacco Use

Most tobacco use begins in early adolescence—almost all first use occurs before the age of 18.\textsuperscript{42} In most countries, few people start smoking after the age of 21; however, in some countries, such as China, prevalence is low during adolescence and increases during early adulthood. In a 1996 national survey in China, the average age at initiation of tobacco use was 19 for men and 25 for women.\textsuperscript{43} Many factors have been reported to affect initiation. These factors differ between industrialized and developing countries and among various groups within a country. Most of the available evidence comes from the industrialized world, but where possible, we highlight representative studies from developing countries.

The development of tobacco use is influenced by a complex interplay of personal, social, and cultural factors which can vary over time and stage of development and may vary in impact on girls and boys.\textsuperscript{44,45} Personal factors include personality type and characteristics that may predispose individuals to risk-taking behaviour. Social influences include the behaviour and attitudes of the individual’s social support network, including friends, family, and peers. Cultural influences constitute the broader environmental context regarding social norms and acceptability in communities, neighbourhoods, and countries.\textsuperscript{44,45} Here, we discuss some of the interpersonal and environmental determinants that may influence initiation of tobacco use among adolescents.

### Personal Factors

Personal factors that have consistently been associated with tobacco use by young people include sociodemo-
graphic factors; socioeconomic factors; knowledge, attitudes, and beliefs; self-esteem; and self-image.

**Sociodemographic factors.** Sociodemographic factors include age, gender, ethnicity and acculturation, family size and structure, and SES. It is difficult to isolate effects of these factors because they interrelate and overlap. Initiation and prevalence of tobacco use among adolescents typically rises with increasing age and grade, peaking during late adolescence and the early twenties. Adolescents who begin smoking at a younger age are more likely to become regular smokers and are less likely to quit smoking.

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**Price affects not only whether adolescents smoke, but also how much they smoke.**

In the United States, Afro-American youths report significantly lower levels of initiation and current smoking than whites or Hispanics. Recent data from the US National Youth Tobacco Survey show little difference in current tobacco use between Afro-American and white middle-school students, but significant differences among high-school students. In 2006, 16% of Afro-American high-school students had smoked within the past 30 days, compared with 28% of white students. The reasons for these differences are not clear given the correlation between race and SES in the United States. However, the mechanisms contributing to initiation for Afro-Americans who do smoke may be different from those for whites; e.g. smoking may serve more of a social function for white adolescents, because they may be more strongly influenced by peer smoking.

Studies of family structure have found that intact, two-parent families tend to be protective against smoking. The effect of household size on risk of tobacco use is unclear: larger families have been associated with both lower and higher levels of tobacco use, and some studies do not associate family size with smoking. Higher levels of parental SES, such as higher education and social class, are found in some studies to be inversely related to tobacco use among adolescents.

**Socioeconomic factors.** Socioeconomic status has been implicated in the risk for onset of smoking among adolescents. Adolescents from lower socioeconomic backgrounds are more likely to smoke than are other adolescents. This difference may reflect, in part, divergent beliefs and attitudes about tobacco use, along with other interpersonal and environmental risk factors. Moreover, cigarette advertising has been shown to influence low-income youth beliefs and attitudes about tobacco use. A field study in Mumbai found that the tobacco industry in India targeted both high- and low-SES youth, using minor variations on similar themes of Westernization and affluence in marketing campaigns. Such advertising associates cigarette smoking with financial success and may make it appear attractive.

In a cross-sectional survey of approximately 12,000 sixth- and eighth-grade students in Delhi and Chennai, India, in 2004, Mathur et al. compared government and private schools as a proxy for SES and found that students from government schools were more likely to be current (within the previous 30 days) and ever-smokers of bidis and cigarettes. They were also about four times as likely as private-school students to have ever used bidis. The survey found a higher prevalence of many psychosocial risk factors among students in government schools, suggesting greater susceptibility to tobacco use. Although this study was not representative of all schoolchildren, and many children do not attend school at all, it suggests that socioeconomic differences observed in Indian adults may hold for children as well.

Personal income of adolescents is also associated with adolescent tobacco use. Some studies indicate that young people with more spending money have higher levels of tobacco use. In several countries, adolescents are even more sensitive than adults to the price of cigarettes: price affects not only whether adolescents smoke, but also how much they smoke. Thus, a rise in the price of tobacco products can have a substantial impact on youth tobacco consumption.

**Knowledge, attitudes, and beliefs.** There is a lack of consensus on the role of tobacco-related knowledge in smoking uptake. Studies have shown that in industrialized countries, adolescents who smoke are usually less knowledgeable about the health risks involved, do not believe that smoking will affect them personally, or feel 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 particularly low because of cultural beliefs and lack of systematic health-education programmes. Knowledge about the health consequences of smoking is limited in many low- and middle-income countries, but this may be changing in some. In China, for example, 61% of adult smokers surveyed in 1996 believed that cigarettes did them "little or no harm." In a 1998 survey among youth, about 80% of the respondents were aware that smoking causes lung cancer and other negative health outcomes. A cross-sectional survey in Egypt conducted in 2005 found that among females, knowledge of the immediate negative consequences of smoking reduced susceptibility to future tobacco use.

In high-income countries, general awareness of the health effects of smoking has undoubtedly increased over the past four decades. Nevertheless, there is some debate about how accurately smokers perceive the risks of developing disease. Various studies conducted over the past several decades have produced mixed conclusions, in part because of differing methodologies and possibly the reluctance of respondents to answer interviewer-administered questions honestly. Recent evidence suggests that most smokers in the United States are aware of their increased risk of disease, but they significantly underestimate the magnitude of this risk relative to that of non-smokers. Young adult smokers, in particular, have been found to underestimate the risk of light smoking. Moreover, even individuals with a reasonably accurate perception of the health risks faced by smokers minimize the personal relevance of this information, believing that other smokers' risks are greater than their own.

In a study of smoker perceptions in the United States, the majority of youth smokers reported giving no thought to how long they would continue to smoke when they began smoking. The majority of those who had given it thought reported expecting to smoke for less than five years. Although many young smokers reported being addicted, they tended to believe that they were less addicted than the average smoker and would be able to quit more easily than other smokers. Young people's overestimation of their ability to quit may play a role in the initiation of regular smoking. Even adolescents who know 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. In a study in northern England, Charlton and Blair found a significant relationship between positive attitudes towards smoking and initiation of smoking among females. Positive beliefs about smoking have also been associated with youth smoking. In general, adolescent smokers have less knowledge about the negative consequences of smoking than their non-smoking counterparts, discount the addictive property of tobacco, and negate the risks of experimental smoking. Data from the 2003 GYTS in Turkey found that having positive beliefs about smokers is cross-sectionally associated with youth susceptibility to smoking, ever-smoking, and established smoking behaviour.

In a series of focus groups among a small sample (n = 27) of Chinese high-school girls in Beijing in 2006, about half of the respondents believed that smoking makes a woman look independent.

Self-esteem. The process of individuation and identity formation is inherent in 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 qualitative self-evaluation, emerges from these contexts. In some studies, lack of self-esteem has been implicated in tobacco use among adolescents. In other research, however, no association was found between self-esteem and smoking initiation. Different measures of self-esteem have been used in the literature, and this may have contributed to the inconsistent findings. The 2001 report of the Surgeon General of the United States concluded that adolescents who smoke are more likely to have low self-esteem and low expectations for future achievement. In fact, they may regard smoking as a means of coping with the stress, anxiety, and depression associated with lack of self-confidence. Several studies have found that girls have lower self-esteem than boys. One study of schoolchildren in Calgary, Canada, found
that girls have lower self-esteem than boys, and a significant association was observed between low self-esteem and smoking behaviour in girls only. Young and Werch also found that young non-smokers and those with no intention of smoking in the future had higher self-esteem than frequent users or those who intended to use in the future.

**Self-image.** Some adolescents may smoke cigarettes to enhance their 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. Adolescents who believe that smoking bestows these attributes may see smoking as a powerful mechanism for self-enhancement. These adolescents may experiment with smoking in an attempt to adopt a perceived positive social image and thereby improve the way others, particularly peers, view them. If peers respond favourably to this strategy, these new young smokers may continue to smoke, since the behaviour has proved functional for them. In a series of focus groups among a small sample (n = 27) of Chinese high-school girls in Beijing in 2006, about half of the respondents believed that smoking makes a woman look independent. These respondents also approved of smoking by celebrities.

Smoking is portrayed in advertising as a means of attaining maturity and adulthood and, for women, of being sophisticated, sociable, feminine, and sexually attractive. In industrialized countries, where the media promote an image of female attractiveness that equates being thin with desirability, weight control and dieting are major obsessions among adolescent girls. Being slim gives these girls self-confidence and seems fashionable. The expected benefits of smoking on body weight may play an important role in smoking uptake. The association between dieting and smoking initiation among adolescents has been studied in high-income countries, including the United States, where Austin et al. found that girls who reported dieting at baseline were four times more likely to become smokers at the two-year follow-up than girls who were not dieting at baseline. In a prospective study of young girls in Massachusetts, putting a greater value on being thin was associated with becoming an “established” smoker (smoking at least 100 cigarettes in one’s lifetime) later on in adolescence.

In a survey of high-school students in an urban location in the United States, nearly 40% of white female cigarette smokers reported using smoking as a method to control their appetite and weight, in contrast to only 12% of white male smokers. No such use of smoking for weight control was reported for Afro-American adolescent smokers. A larger survey of ninth- and twelfth-grade students in Minnesota found that close to 50% of adolescent female smokers and 28% of male smokers reported smoking cigarettes to lose weight or control weight in the previous 12 months. After controlling for grade level, Afro-American female smokers were found to be half as likely as white female smokers to use smoking for weight control. In addition, heavy smoking was shown to correlate with weight-control behaviour, as adolescent heavy smokers were more than three times as likely as light smokers to report smoking for weight control or weight loss.

**Socioenvironmental Factors**

Environmental factors that influence initiation and maintenance of tobacco use by adolescents include parental influence, peer tobacco use, and advertising of tobacco products.

Parental influence. The impact of parental smoking has been studied in a wide range of contexts in a large number of studies, which have resulted in a variety of outcomes. Most studies of the association between parent smoking and adolescent smoking have been conducted in industrialized countries. Some have found significant associations, and some have not. Bauman et al. found that smoking among adolescents is more strongly related to whether a parent has ever smoked than to whether a parent currently smokes. However, several other studies observed that adolescents with parents who are current smokers are more likely to smoke than adolescents with parents who are former smokers. Further, the influence of parental smoking may be gender-specific, as young girls have been found to be more likely to smoke when their mother is a current smoker. Ashley et al. found in a nationally representative sample of US adolescents in 2002 and 2003 that cigarette smoking among mothers was associated with a greater risk of cigarette smoking by daughters than by sons. Data from a nationally representative sample in New Zealand did not show gender-specific associations of parental smoking with adolescent smoking for the same sex, although it found that parental smoking behaviour in combination with other factors under parental control (i.e. provision...
of pocket money and allowing smoking in the home) is a key determinant of daily smoking by adolescents.\textsuperscript{120}

The relationship between parental smoking and adolescent smoking could be interpreted in a variety of ways. The most straightforward interpretation is that parents who smoke serve as models for the behaviour of their children.\textsuperscript{44} Alternatively, being raised in a home where parents smoke exposes a young person to cigarette smoke, and such exposure may lead to greater perceived parental approval of smoking by adolescents.\textsuperscript{121,122} Finally, parents who smoke may facilitate their children’s smoking simply by giving children easier access to cigarettes or allowing smoking in the home.\textsuperscript{123}

Studies comparing the associations between peer and adolescent smoking and between parent and adolescent smoking have generally found that peer smoking is a better predictor of adolescent smoking, although the study context and the stage of adolescent tobacco use affect this finding.\textsuperscript{3,124} Bricker et al.\textsuperscript{125} studied smoking by adolescents and determined that parental influence was substantial throughout the transition from non-use to experimentation and daily use, whereas peer influence was stronger for the transition from not smoking to experimentation. Other research found similar results, i.e. that parental influence on initiation and escalation to daily smoking remains constant or decreases over time, while smoking by friends is more predictive of initiation than of escalation.\textsuperscript{3}

Some evidence indicates that adolescents are more likely to smoke if their older siblings smoke.\textsuperscript{118,126} Presumably, this is partly because older siblings model, prompt, and reinforce smoking behaviour with their younger siblings. Households in which older siblings smoke may also be households in which 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.

Less information is available on the role of parents in developing countries. The few recent studies of parental influence produced mixed results, similar to studies in industrialized countries. Gender differences in the association between parent smoking and adolescent smoking were reported in Brazil, similar to those found in some studies in the United States.\textsuperscript{44} A prospective birth-cohort study in Brazil found that parental smoking during pregnancy and childhood may be a more important determinant of smoking in adolescent girls than in boys.\textsuperscript{127}

In China, parental current smoking status and parental monitoring of youth have been identified as risk factors for youth tobacco use in some studies, but not in others. A longitudinal study in seven Chinese cities found that parental monitoring was predictive of smoking within the previous 30 days by male and female adolescents.\textsuperscript{128} Cross-sectional data from the same study sampled ninth-grade students in urban and rural areas and showed that adolescent smoking was not strongly associated with current parental smoking in either type of area.\textsuperscript{129} A cross-sectional survey of students in Huangpu, Guangzhou, found a significant association between mothers’ smoking and experimental smoking by females and males, although the association with female youth was greater.\textsuperscript{130} In contrast, fathers’ smoking was significantly associated only with smoking among males.

\textbf{In a 2003 study of students in Alexandria, Egypt, parental and sibling smoking was associated with ever-smoking, smoking in the prior 30 days, and susceptibility to smoking.}

Finally, findings on the importance of parental smoking relative to peer influence are inconsistent in recent literature. In a 2003 study of students in Alexandria, Egypt, parental and sibling smoking was associated with ever-smoking, smoking in the prior 30 days, and susceptibility to smoking (defined as the likelihood of smoking in the next year or when the child is older).\textsuperscript{131} Other traditional risk factors, including peer smoking, positive beliefs about smoking, and perceived social norms, were also associated with smoking or smoking susceptibility. In general, the associations with parental and sibling smoking were found to be stronger than those with peer smoking, leading to the conclusion that in this more collective society, the family unit may have a stronger influence than it typically has in some Western countries. However, in a small study of female university smokers in Cairo, Labib et al.\textsuperscript{132} reported
that almost all the respondents had friends who smoked, and more than half of the water pipe smokers reported being introduced to water pipes by a female friend. Relatively few female smokers reported being introduced by a male or female relative. While the importance and predictive value of parental influence on adolescent tobacco use is inconsistent in the literature, the potential gender-specific and cultural differences indicate that parental influence is an important predictor of adolescent smoking, but it is one of many risk factors.

**Peer tobacco use.** Peers have been variously defined as classmates, friends, best friends, opposite- or same-sex friends, and boyfriends or girlfriends.\(^{72}\) Regardless of the definition used, however, peer tobacco use is consistently related to adolescent tobacco use initiation, maintenance, and intentions.\(^{5,133–135}\) Taylor et al.\(^{136}\) found that adolescents in the United States who had one significant peer who smoked were almost four times more likely to smoke than those without a significant peer who smoked. In some settings, smoking may be a shared activity with important socializing functions for female youth,\(^{137,138}\) and same-sex friends may be particularly influential in the smoking behaviour of female adolescents.\(^{137,137,138}\)

From the findings of cross-sectional studies, it is difficult to determine whether female adolescents model their behaviour after friends or select peers with similar behaviour. To some extent, it is possible that an adolescent begins to smoke, then becomes friends with others who smoke.\(^{139,140}\) However, 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 those with non-smoking friends.\(^{141,142}\)

Social influences appear to be important even after a young person begins smoking regularly. Peer smoking has been shown to predict continued smoking by young people.\(^{141}\) Presumably, adolescents who begin to smoke and continue receive social reinforcement from peers. Christakis and Fowler\(^{143}\) conducted a network analysis using prospective data from the United States and found that groups of individuals tended to quit smoking together and were heavily influenced by their social networks, including spouses, friends, and siblings.

Studies conducted in other countries, including Mexico and the Russian Federation, point to the strong influence of peer smoking on adolescent smoking behaviour.\(^{94,164}\) Recent studies of the relationship between social factors and adolescent smoking behaviour among Chinese have also highlighted the importance of peer smoking influences.\(^{128–130,145}\) In a study of college students in China, having friends who smoke, parental SES, depression, alienation, and other health risk behaviours were associated with women’s intention to smoke.\(^{146}\) In another study, nearly 40% of Chinese women smokers in China, Hong Kong Special Administrative Region reported the influence of friends or colleagues as a reason for beginning to smoke. Substantially fewer (9%) reported familial influence on smoking initiation.\(^{147}\)

These data suggest that many of the factors related to smoking uptake among youth in Western cultures—in particular, the role of peer smoking—may be applicable to Chinese youth as well.

**Marketing and advertising of tobacco products.** Tobacco advertising and promotion have a direct effect on the initiation of tobacco use among adolescents.\(^{5,54,148}\) Tobacco companies deny marketing cigarettes to young people, but a great deal of evidence indicates that they are hard at work recruiting young people to smoke. In the United States, about 4000 adolescents start smoking cigarettes every day, and about 1140 adolescents become daily cigarette smokers. About 1100 smokers die every day from smoking-related illnesses in the United States, and more than 3000 quit smoking.\(^{149,150}\) The majority of smokers begin smoking before age 18.\(^{55}\) Thus, recruiting young people to smoke is vital to profit maintenance for the tobacco companies. A recent meta-analysis of tobacco marketing in various countries found that exposure to all pro-tobacco marketing and media doubles the odds of tobacco use initiation.\(^{151}\)

Marketing to young people is not just a matter of ensuring future sales. Sales to minors are also a significant source of profit for the tobacco companies. Healton et al.\(^{152}\) estimated that in 2002, the wholesale value of cigarettes sold annually to adolescents under age 18 in the United States was about US$ 1.2 billion (and virtually all these sales are illegal). This represents a substantial increase over the 1997 estimate of US$ 737 million and is primarily the result of increasing wholesale prices.

In addition to direct and indirect advertising and promotion, exposure to other external cues, such as smoking in movies, has been shown to increase the risk for subsequent initiation in children.\(^{153–156}\) A recent study in Germany found
that youths in the highest quartile of movie-smoking exposure were almost twice as likely to try smoking as those in the lowest quartile, after controlling for known determinants of initiation such as peer and parental smoking.\textsuperscript{157} Wills et al.,\textsuperscript{158} using longitudinal data from a representative sample in the United States, modelled movie-smoking exposure, mediators, and smoking onset and found a direct effect of movie-smoking exposure on smoking onset, as well as a larger effect on changing smoking expectancies among girls.\textsuperscript{158} The relationship between movie-smoking exposure and adolescent smoking has also been studied in Mexico. Thrasher et al.\textsuperscript{94} performed a cross-sectional study of 3876 schoolchildren in two cities in Mexico in 2006 and found a positive association between exposure to smoking in films and current and ever-smoking. Among ever-smokers, positive associations were observed between exposure to smoking in films and susceptibility to smoking, favourable attitudes towards smoking, and perceived peer smoking prevalence.

### Maintenance of Tobacco Use

Women continue to smoke because of a complex interplay of factors, including physiological addiction to nicotine and psychological and social factors.

#### Physiological Dependence

It is well known that cigarettes and other forms of tobacco are addictive and that nicotine is the drug in tobacco that leads to addiction.\textsuperscript{4,5} The American Psychiatric Association\textsuperscript{159} and WHO\textsuperscript{160} have classified nicotine dependence as a mental disorder. These organizations’ definitions of dependence include a strong desire for a substance and difficulty controlling use; physiological withdrawal when use is stopped or reduced; evidence of tolerance; and persistent use despite knowledge of harms. Smokers who are deprived of cigarettes experience withdrawal and tend to compensate for periods of deprivation by increasing consumption when cigarettes become available; such compensatory activity regulates the nicotine level in the bloodstream.\textsuperscript{161} Evidence indicates that use of smokeless tobacco produces the same effects,\textsuperscript{162} with symptoms associated with withdrawal including nausea, headache, constipation, diarrhoea, increased appetite, drowsiness, fatigue, insomnia, inability to concentrate, irritability, hostility, anxiety, and craving for tobacco.\textsuperscript{4,5}

The dependence-producing properties of nicotine are responsible for its reinforcing effects. Once a person has begun to use tobacco habitually, attempts to quit using it produce symptoms of withdrawal. These symptoms can be reduced or terminated by resuming smoking or chewing tobacco, which 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.\textsuperscript{4}

Several studies have suggested that women may have a harder time quitting smoking than men, which may be due in part to the greater tendency for women to smoke in response to negative affect, stress, or depression, or to control weight.\textsuperscript{163–168} A recent study found that nicotine metabolism was faster among women than among men and faster among women taking oral contraceptives, which may have relevance for the efficacy of nicotine replacement medications for women.\textsuperscript{169} Some studies have shown that women are less sensitive than men to the reinforcing effects of nicotine but more sensitive to non-nicotine smoking cues, such as social cues.\textsuperscript{44,164–166,168,170} The evidence for differences between men and women in the extent of withdrawal symptoms is mixed. Most research suggests no
differences; however, the extent of women's symptoms may vary as a function of menstrual cycle stage.\textsuperscript{164,171}

**Psychosocial Factors**

**Stress.** Many women smoke in response to negative life experiences.\textsuperscript{64,72} Although both men and women may smoke to reduce stress, they experience different stresses. For example, in recent years, women have entered the workforce in large numbers, but they still shoulder the majority of child care, elder care, and household responsibilities. Women in the workforce also generally hold lower-level service or manufacturing jobs, which provide little sense of autonomy or control and may increase stress.

**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 their cigarette use.**

Women may smoke in response to other types of emotional distress as well, such as anger, resentment, or anxiety.\textsuperscript{164,172} A recent survey in the United Kingdom found that women were more likely than men to report stress as a reason for smoking again after a failed quit attempt.\textsuperscript{173}

Women may use smoking to temper negative emotions and to better fit the societal norm. Traditionally, in Western culture, women are praised and rewarded for their beauty, defined as being youthful and thin. Many women strive for this cultural ideal, regardless of the cost to their health, using smoking as a means of weight control.\textsuperscript{44} The factors that contribute to women's maintenance of smoking may be indicative of women's lower status in the society and the inequality women often face.

**Depression.** Prevalence of cigarette smoking has been found to be higher for persons having psychiatric disorders\textsuperscript{44} such as schizophrenia, mania, personality disorders,\textsuperscript{174} depression,\textsuperscript{175–180} or panic disorders.\textsuperscript{178,180} Depressed smokers are more likely to be nicotine dependent\textsuperscript{164,181} and less likely to quit smoking.\textsuperscript{164,175,177,182,183} Smokers with a history of depression also have a greater risk of relapse after a cessation attempt.\textsuperscript{181,184} It has been reported that smoking cessation causes more-intense depressed moods in smokers with a history of depression, resulting in lower success rates for cessation.\textsuperscript{64} A study of patients hospitalized for cardiovascular disease suggests that recent quitters exhibiting depressive symptoms during hospitalization are more likely to relapse, and their depression may be exacerbated by stronger withdrawal symptoms.\textsuperscript{185} The prevalence of depression among women is twice that among men,\textsuperscript{159} and women may be more likely to smoke in response to negative affect,\textsuperscript{164,186} indicating that the associations between smoking and depression may be particularly important for women.

Several longitudinal studies have shown an association between smoking and depression among adolescents.\textsuperscript{139,185,187,188} In a longitudinal study in the United States, Kandel and Davies\textsuperscript{39} reported that depressed adolescents were more likely than non-depressed adolescents to report daily smoking nine years after initiation of smoking. Patton et al.\textsuperscript{187} studied adolescents in Australia and showed that depressive symptoms increased the risks for experimental smoking in the presence of peer smoking. Goodman and Capitman\textsuperscript{189} found that, after controlling for other determinants of smoking, smoking among adolescents was a predictor of subsequent depressive symptoms rather than vice versa. This finding suggests a complex and dynamic process between depressive symptoms and smoking uptake and maintenance.\textsuperscript{164,181}

**Body weight.** Body weight is an important concern in the initiation and maintenance of smoking by women. Several studies of female adolescents and adults have found relationships between smoking and body image, body weight, and dieting behaviour.\textsuperscript{44,105–109,190,191} Women's concerns about weight may encourage smoking initiation, be a barrier to smoking cessation, and increase relapse rates among women who stop smoking.\textsuperscript{110,192–197} Women who smoke to control weight report greater dietary restraints\textsuperscript{191} and more eating-disorder symptoms.\textsuperscript{192} In addition, restrained eaters endorse the use of smoking for weight-control purposes significantly more than unrestrained eaters do.\textsuperscript{197}
Much research has also investigated whether fear of gaining weight discourages attempts to quit. The findings suggest that concerns about weight gain often hinder smoking cessation, especially among women, although some results have not supported this. Additionally, women tend to gain more weight than men do after quitting. Because women may initiate smoking in order to lose or maintain weight and continue to smoke for fear of weight gain, weight control may represent an important motivational factor in their cigarette use. Gerend et al. found that a minority of women reported using smokeless tobacco for weight management, but its use for this reason may not be a predominant mediator, as cigarette smoking is.

Summary and Recommendations

Summary

Over the past several decades, the tobacco pandemic has been shifting from industrialized to developing nations to increasingly involve women. The increase in tobacco use among women has typically followed weakening social, cultural, and political constraints, which have been exploited by multinational tobacco companies. Global estimates show wide variation in the prevalence of smoking among women. In some regions, prevalence is comparable among men and women, while in others, there are very large differences by sex and gender. Recent estimates of tobacco use among youth show similar patterns among boys and girls in many areas of the world, suggesting that these differences may be narrowing. Although effective tobacco control policies are available, they could be optimized by understanding the factors that influence uptake and maintenance of tobacco use and how these factors may differ between boys and girls. Evidence suggests that girls and women may be more influenced by beliefs about weight control and self-image and by female friends or role models, and that women smoke to cope with stress and negative feelings more than men do. However, most of the literature on smoking initiation comes from industrialized countries, where the mix of social, environmental, and cultural influences may be quite different from that in developing countries. Further research is needed to understand the extent to which these well-established factors relate to smoking initiation and maintenance in a variety of settings.

Recommendations

• Develop culturally sensitive and gender-specific community programmes to prevent initiation and maintenance of tobacco use.

• 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 of all ages as well as boys and men.

• Monitor patterns of tobacco use specific to girls and women through the life-course.

• Ensure that sex-disaggregated data and a gender analysis are included in surveillance systems, research, monitoring, and evaluation of tobacco control programmes.

References


Pin-up

The Smoker’s Body

Every 5 seconds someone dies from tobacco use, says the World Health Organization. Research suggests that people who start smoking in their teens (as more than 15 percent do) and continue for two decades or more will die 20 to 30 years earlier than those who never light up. It is not just lung cancer or heart disease that cause severe health problems and death. Below, some of smoking’s less predictable side effects—from head to toe.

1. Hair loss

Not surprisingly, smoking causes the hair to become coarse, dry, and brittle. It also lessens the body’s ability to absorb and transport nutrients, which may cause hair loss.

2. Cataracts

Cigarette smoke irritates the eye and cancels out certain enzymes needed to keep the lens healthy. The damage to the lens can lead to cataracts, which may become so severe that they require surgery.

3. Wrinkles

Cigarette smoke results in wrinkles faster on the face and neck. This is because the skin becomes thinner and looser when the body is deprived of oxygen.

4. Hearing loss

Smoking can lead to hearing loss in a number of ways. First, the inner ear is deprived of oxygen, which impairs its ability to function properly. Second, smoking increases the risk of middle ear infections, which can further damage the ears.

5. Cancer

The most obvious health effect of smoking is cancer. Tobacco contains over 4000 chemicals, some of which cause cancer. Smoking is linked to almost half of all cancers worldwide.

6. Youth decay

Smoking can lead to tooth decay. The nicotine in tobacco irritates the mouth and helps bacterial growth. Tobacco also promotes tooth erosion, which can lead to tooth decay.

7. Employment

Most employers will not hire people who smoke. This is because smoking can lead to a number of health problems, including lung cancer, heart disease, and stroke. These conditions can make it difficult to work and can also lead to early retirement.

8. Depression

Smoking can cause depression. The nicotine in tobacco affects the brain and can lead to mood swings, irritability, and anxiety. Smoking can also lead to sleep disturbances, which can increase the risk of depression.

9. Heart disease

Smoking is a major risk factor for heart disease. Tobacco contains nicotine, which can constrict blood vessels and raise blood pressure. Smoking can also lead to blood clots, which can cause heart attacks.

10. Stroke

Smoking is a major risk factor for stroke. Tobacco contains nicotine, which can constrict blood vessels and raise blood pressure. Smoking can also lead to blood clots, which can cause strokes.

11. McNicotn

Tobacco contains nicotine, which is highly addictive. Nicotine causes the body to produce more of its own nicotine, which makes it harder to quit. Tobacco also contains tar, which is a major cause of death.

12. Smoke cancer and miscarriages

Tobacco contains more than 2000 chemicals, some of which cause cancer. Smoking is linked to almost half of all cancers worldwide.

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15. Nearer’s disease

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The author was not available for further comments.

Research was supported by the World Health Organization and the United States Pharmacopeia.


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