

**Section 2**  
**Situation Analysis/Mapping**

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**Chapter 2**  
**Patterns of Tobacco Use,  
Exposure, and Health Consequences**

## Chapter 2

# Patterns of Tobacco Use, Exposure, and Health Consequences

Tobacco products, both smoked and smokeless products, are used in a wide variety of forms around the world, and the patterns of use and resulting health and economic burden vary across the globe. Effective tobacco control policies and programs are aimed at reducing the demand for tobacco products and the death, disease, and economic cost of their use. This chapter examines tobacco consumption and prevalence, as well as the impact of tobacco use and secondhand smoke exposure on health and mortality. Specific topics include:

- Current patterns of tobacco use across world regions and in selected countries for smoked and smokeless products
- Exposure to secondhand smoke, the effects of this exposure on health, and the associated disease burden
- Health disparities related to tobacco use
- The impact of tobacco use on noncommunicable diseases, communicable diseases, and mortality.

This chapter describes the extent of tobacco use among youths and adults globally by drawing on national or subnational data available for various countries. The chapter also examines the health consequences of tobacco use, including data that is used in planning and evaluating tobacco control policy and program interventions in many countries.

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## Introduction

Tobacco is the only legal product that kills a large proportion of its consumers when used as intended by its manufacturers. The World Health Organization (WHO) has estimated that around 6 million people die each year from tobacco use<sup>1</sup> including 600,000 who die from exposure to secondhand smoke (SHS).<sup>2</sup> Unless strong tobacco control measures are put in place, the number of tobacco-related direct and indirect deaths is projected to increase to 8 million by 2030, with more than 80% of these deaths expected to occur in low- and middle-income countries (LMICs).<sup>3</sup>

The patterns of tobacco use and health effects of the tobacco epidemic vary throughout the world. It is very important to understand current patterns and trends in tobacco use worldwide (both smoking and smokeless as well as exposure to SHS) in order to address the many complex issues associated with the economics of tobacco control. The purpose of this chapter is to provide a brief overview of the global information available on the use of tobacco products worldwide and in selected countries, as well as the impact of tobacco use on disease and mortality.

The information on tobacco smoking among adults presented in this chapter is drawn from the *WHO Global Report on Trends in Prevalence of Tobacco Smoking, 2015*.<sup>1</sup> Data on tobacco smoking among adults in the United States are derived from the National Adult Tobacco Survey (NATS).<sup>4</sup> Data for smoking and smokeless use among youth ages 13–15 years come from the Global Youth Tobacco Survey (GYTS),<sup>5</sup> the Health Behaviour in School-Aged Children Survey (HBSC)<sup>6</sup> (mostly in European countries), and the National Youth Tobacco Survey (NYTS)<sup>7</sup> (in the United States). Information on smokeless tobacco (ST) is drawn from WHO records as well as the report *Smokeless Tobacco and Public Health: A Global Perspective*<sup>8</sup> produced by the National Cancer Institute (NCI) of the National Institutes of Health and by the Centers for Disease Control and Prevention (CDC), both agencies of the U.S. Department of Health and Human Services. Information on health outcomes from tobacco use is derived from the *WHO Global Report: Mortality Attributable to Tobacco*,<sup>9</sup> which provides information on mortality consequences by country and across regions. Data from these sources have been used extensively by many countries in planning and evaluating their tobacco control policy and program interventions. (For more information on how the data were used in calculations, please see the Statistical Annex at the end of this monograph.)

Consistent with the rest of the monograph, the data for this chapter have been analyzed by geographical area. Countries were organized by WHO Region—the African, Americas, South-East Asia, Eastern Mediterranean, European, and Western Pacific Regions. One adjustment was made to this organization: all countries classified as high income by the Organisation for Economic Co-operation and Development (OECD) were grouped into one category regardless of their WHO Region. These high-income countries are: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom of Great Britain and Northern Ireland, and the United States. Thus, the tables and figures in this chapter present information for these countries separately from their WHO Region.

## Diversity of Tobacco Products Worldwide

A wide variety of tobacco products, differing in design, ingredients, and modes of consumption, are used around the world. The use and impact of these diverse tobacco products are complex. Tobacco products have traditionally been broadly classified into two categories—those that are smoked and those

that are chewed or sniffed, that is, ST products. Many tobacco products contain added flavors and other ingredients in addition to tobacco, and no tobacco product has been shown to be free of harm.<sup>10</sup>

Smoked products include manufactured and roll-your-own cigarettes, cigars, bidis, kreteks, waterpipe, and many others. ST products can be premade (sold ready to use) or custom-made (assembled by the user or a vendor according to user preferences), and may include a variety of non-tobacco ingredients such as ashes, alkaline agents, areca nut, spices, catechu, or other plant materials.<sup>8</sup> A third class of products has recently emerged, often called electronic nicotine delivery systems (ENDS) (e.g., electronic cigarettes, e-cigarettes, e-hookah, vape pens, tank systems). ENDS are battery-powered devices designed to heat a liquid, which typically contains nicotine, into an aerosol for inhalation by the user. These products are very diverse, encompassing hundreds of products and brands.<sup>11</sup>

Manufactured cigarettes are the most commonly used form of tobacco, accounting for 92.3% of tobacco product sales worldwide<sup>12</sup>; as a consequence, cigarettes cause most global tobacco-related harm.<sup>10</sup> Among some populations, however, ST products predominate (e.g., in the South-East Asia Region).<sup>8</sup>

### Box 2.1: Characteristics of Types of Products

- Manufactured cigarettes consist of shredded or reconstituted tobacco along with a variety of additives. They are wrapped in paper, often have a filter, and are mass-produced by machines. Manufactured cigarettes, the predominant form of tobacco used worldwide, accounts for 92.3% of total tobacco sales in the world.<sup>12</sup>
- Kreteks, or clove cigarettes, contain minced, dried clove buds in addition to tobacco and are produced and commonly used in Indonesia.
- Bidis are small hand-rolled cigarettes wrapped in a tendu leaf; they are commonly used in India as an inexpensive alternative to conventional cigarettes.
- Cigars, which can be hand or machine rolled, consist of a roll of tobacco wrapped in tobacco leaf or tobacco-containing paper. Little cigars (or cigarillos) are approximately the size of a cigarette and may contain added flavorings.
- Waterpipe (also known as hookah or shisha) smoking involves inhaling tobacco smoke through a water basin. A waterpipe typically includes a head (in which a brick of flavored tobacco, along with coal, is burned), a large body housing the water bowl, and a hose for inhalation. Waterpipe use is most common in the Middle East but has recently gained popularity in many other regions.
- Moist snuff, or dip, is typically made of damp and finely ground or shredded tobacco. A lump of this product is placed between the lip and the gum and held there. Snus is a traditionally Swedish smokeless form of moist, fine tobacco that is typically pasteurized.
- Gutka contains betel quid (betel leaf, areca nut, and slaked lime), tobacco, and a variety of flavorings. Gutka is commercially available in foil packets/sachets and tins and is widely used in the Indian subcontinent and throughout the Asian and Pacific regions.
- Electronic nicotine delivery systems (ENDS) are battery-powered devices designed to heat a liquid (typically of propylene glycol, glycerin, nicotine, flavors, and sometimes other chemicals) into an aerosol for inhalation by the user.

## Smoked Tobacco Products

### Prevalence of Tobacco Smoking Among Adults

The information presented in this section is derived from data generated for the *WHO Global Report on Trends in Prevalence of Tobacco Smoking, 2015*.<sup>1</sup> This report produced fitted estimates for current and daily tobacco smoking, as well as current and daily cigarette smoking for the years 2000, 2005, 2010, 2013 and then, based on the trends for these years, projected to 2025. Projections are only shown for the years 2015, 2020, and 2025. Data for 2013 have been used to understand the currently prevailing status of tobacco use levels.

As shown in Table 2.1, the results for 2013 indicate that 21.2% of the world's population age 15 years and over (both sexes combined) were current smokers, which represents a decrease in prevalence from an average of 26.5% in 2000, and 22.1% in 2010. Following the High-Level Meeting of the United Nations General Assembly on the Prevention and Control of Noncommunicable Diseases in 2012, WHO Member States unanimously agreed in 2013 to a 30% relative reduction target in global prevalence of tobacco use (both smoking and smokeless) by 2025, using 2010 as baseline.<sup>1</sup> Applying this target reduction to the 2010 baseline of 22.1% results in an expected absolute target of 15.5% in 2025. If countries continue to apply tobacco control measures with the same intensity as they did during the period 1990–2010, the WHO projection exercise indicates that, collectively, countries will only achieve a level of 18.9% in 2025, 3.4% above the reduction target.

**Table 2.1 Estimated and Projected Prevalence Rates (%) for Tobacco Smoking, by WHO Region, Country Income Group, and Sex, 2000–2025**

Sex	WHO Region	Estimated prevalence				Projected prevalence			2025 target†	Target gap‡
		2000	2005	2010	2013	2015*	2020*	2025*		
Male	<b>Global</b>	<b>42.7</b>	<b>39.4</b>	<b>36.9</b>	<b>35.8</b>	<b>35.2</b>	<b>34.0</b>	<b>33.2</b>	<b>25.8</b>	<b>7.4</b>
	African	20.7	21.6	23.2	24.7	26.0	30.1	34.7	16.2	18.5
	Americas	32.9	28.4	24.7	22.8	21.6	18.9	16.7	17.3	-0.6
	Eastern Mediterranean	32.0	33.0	35.1	36.8	38.1	41.6	45.2	24.6	20.6
	European	59.2	54.7	50.7	48.5	47.2	43.9	40.7	35.5	5.2
	South-East Asia	40.6	36.3	33.1	31.7	30.8	29.0	27.5	23.2	4.3
	Western Pacific	55.9	52.9	50.4	49.4	48.7	47.1	45.0	35.3	9.7
	High-income OECD	39.0	34.6	30.8	28.6	27.5	24.4	21.8	21.6	0.2
	<b>Female</b>	<b>Global</b>	<b>10.4</b>	<b>8.7</b>	<b>7.3</b>	<b>6.6</b>	<b>6.2</b>	<b>5.4</b>	<b>4.7</b>	<b>5.1</b>
African	3.6	3.0	2.5	2.3	2.1	1.8	1.6	1.8	-0.2	
Americas	16.8	13.9	11.5	10.4	9.6	8.1	6.8	8.1	-1.3	
Eastern Mediterranean	5.2	3.8	3.0	2.8	2.7	2.5	2.4	2.1	0.3	
European	18.2	17.2	16.1	15.6	15.2	14.3	13.5	11.3	2.2	
South-East Asia	6.0	4.1	2.9	2.4	2.1	1.6	1.2	2.0	-0.8	
Western Pacific	3.7	3.1	2.6	2.4	2.3	2.1	1.8	1.8	-0.0	
High-income OECD	23.7	21.1	18.8	17.7	16.8	15.1	13.5	13.2	0.3	

Table 2.1 (continued)

Sex	WHO Region	Estimated prevalence				Projected prevalence			2025 target†	Target gap‡
		2000	2005	2010	2013	2015*	2020*	2025*		
<b>Both sexes</b>	<b>Global</b>	<b>26.5</b>	<b>24.0</b>	<b>22.1</b>	<b>21.2</b>	<b>20.7</b>	<b>19.7</b>	<b>18.9</b>	<b>15.5</b>	<b>3.4</b>
	African	12.1	12.2	12.8	13.4	14.0	15.9	18.1	9.0	9.1
	Americas	24.6	20.9	17.9	16.4	15.4	13.3	11.6	12.5	-0.9
	Eastern Mediterranean	18.9	18.8	19.6	20.4	21.0	22.7	24.5	13.7	10.8
	European	37.4	34.8	32.3	31.0	30.2	28.1	26.2	22.6	3.6
	South-East Asia	23.6	20.5	18.2	17.2	16.7	15.5	14.5	12.7	1.8
	Western Pacific	30.3	28.5	27.0	26.4	26.0	25.1	23.9	18.9	5.0
	High-income OECD	31.1	27.7	24.6	23.0	22.0	19.6	17.6	17.2	0.4

Sex	World Bank country income group	Estimated prevalence				Projected prevalence			2025 target†	Target gap‡
		2000	2005	2010	2013	2015*	2020*	2025*		
<b>Male</b>	<b>Global</b>	<b>42.7</b>	<b>39.4</b>	<b>36.9</b>	<b>35.8</b>	<b>35.2</b>	<b>34.0</b>	<b>33.2</b>	<b>25.8</b>	<b>7.4</b>
	High-income	42.1	37.7	34.1	32.1	31.0	28.4	26.3	23.9	2.4
	Upper middle-income	49.3	46.1	43.6	42.4	41.6	40.0	38.2	30.5	7.7
	Lower middle-income	36.9	34.3	32.7	32.3	32.1	32.0	32.3	22.9	9.4
	Low-income	37.5	33.8	31.2	30.2	29.9	30.0	31.0	21.8	9.2
<b>Female</b>	<b>Global</b>	<b>10.4</b>	<b>8.7</b>	<b>7.3</b>	<b>6.6</b>	<b>6.2</b>	<b>5.4</b>	<b>4.7</b>	<b>5.1</b>	<b>-0.4</b>
	High-income	22.7	20.6	18.5	17.5	16.8	15.3	13.9	13.0	1.0
	Upper middle-income	7.8	6.5	5.5	5.1	4.8	4.2	3.7	3.9	-0.2
	Lower middle-income	5.6	4.2	3.2	2.8	2.5	2.0	1.7	2.2	-0.5
	Low-income	6.2	4.5	3.4	2.9	2.7	2.2	1.9	2.4	-0.5
<b>Both sexes</b>	<b>Global</b>	<b>26.5</b>	<b>24.0</b>	<b>22.1</b>	<b>21.2</b>	<b>20.7</b>	<b>19.7</b>	<b>18.9</b>	<b>15.5</b>	<b>3.4</b>
	High-income	32.1	28.9	26.1	24.6	23.7	21.7	20.0	18.3	1.7
	Upper middle-income	28.7	26.4	24.6	23.8	23.3	22.2	21.1	17.2	3.9
	Lower middle-income	21.5	19.4	18.1	17.7	17.5	17.2	17.2	12.7	4.5
	Low-income	21.7	19.0	17.1	16.4	16.1	15.9	16.2	12.0	4.2

\*Projections are shown for the years 2015, 2020, and 2025.

†The 2025 target was calculated as a 30% relative reduction using the 2010 estimated prevalence rate as the baseline.

‡The target gap was calculated as the absolute difference between the 2025 projected prevalence rate and the 2025 target.

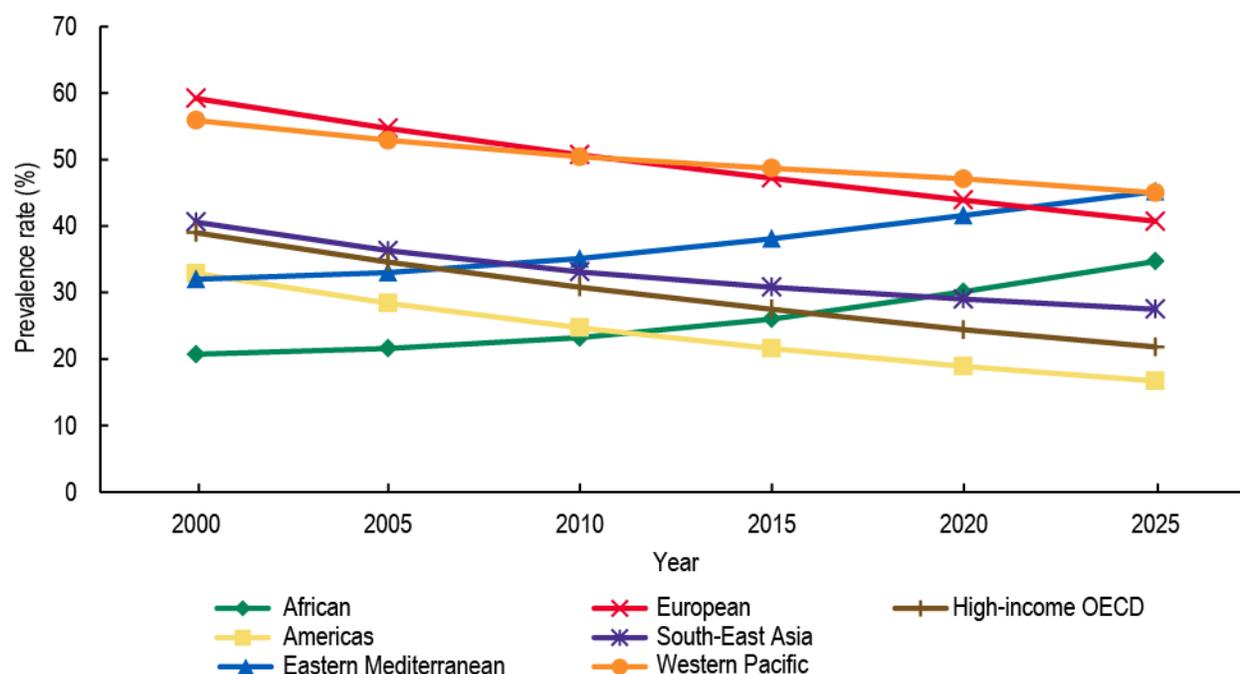
Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. Country income group classification based on World Bank Analytical Classifications for 2013. High-income OECD countries are excluded from their respective regions.

Source: Based on data from World Health Organization 2015.<sup>1</sup> For more information, see the Statistical Annex.

In addition to the data for both sexes combined, the WHO prevalence trends analysis was conducted separately for males and females age 15 years and over. Using the same 30% relative reduction target, the 2010 global tobacco smoking levels of 36.9% for males and 7.3% for females translate into 2025 target levels of 25.8% for males and 5.1% for females. The projections to 2025 by sex indicate that globally males will only achieve a level of 33.2% in 2025, or 7.4% above the target. With a projected level of 4.7%, females are expected to reach the 2025 target of 5.1% (Table 2.1).<sup>1</sup>

Trends for each region and the high-income OECD countries (Figures 2.1 and 2.2) indicate that prevalence rates for males and females in all regions are trending downwards, except for male prevalence rates in the African and Eastern Mediterranean Regions, which are projected to increase between 2000 and 2025. The countries within the Region of the Americas (excluding Canada and the United States, which are grouped in the OECD category) are the only group of countries that are projected to reach the 2025 tobacco reduction target of 30% for both males and females. No other group is projected to reach the target for males, but the high-income OECD group will be very close to the 2025 target level. Unless strong action is taken in the African and Eastern Mediterranean Regions to address the tobacco epidemic, the failure to reach the target for males will be particularly marked, at 18.5% and 20.6% above those regions' respective 2025 targets for males.<sup>1</sup>

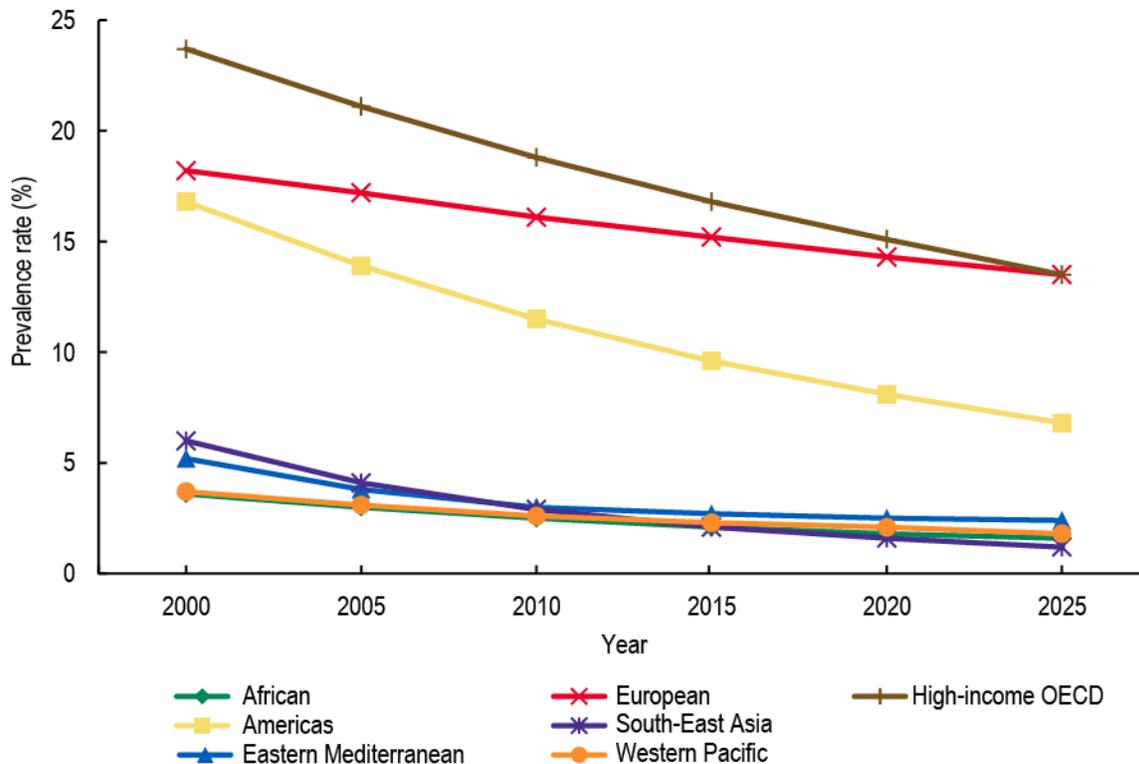
**Figure 2.1** Estimated and Projected Prevalence Rates for Tobacco Smoking, by WHO Region, Males, 2000–2025



Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. Projections are shown for the years 2015, 2020, and 2025.

Source: Based on data from World Health Organization 2015.<sup>1</sup> For more information, see the Statistical Annex.

**Figure 2.2** Estimated and Projected Prevalence Rates for Tobacco Smoking, by WHO Region, Females, 2000–2025



Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. Projections are shown for the years 2015, 2020, and 2025.

Source: Based on data from World Health Organization 2015.<sup>1</sup> For more information, see the Statistical Annex.

WHO has estimated that the number of smokers age 15 years and older in the world has changed very little over the past 15 years, remaining at slightly more than 1.11 billion since the year 2000 (Table 2.2).<sup>1</sup> This number is not expected to decrease in the near future, and may reach about 1.15 billion in 2025. Importantly, the global lack of decrease in the number of smokers is due mainly to population growth, as the prevalence of smoking is decreasing in most regions. In 2013, there were approximately 349 million smokers in the Western Pacific Region and 228 million smokers in the South-East Asia Region, accounting for more than 50% of the total number of smokers in the world. Between 2000 and 2013, the number of smokers in the high-income OECD countries decreased by 45 million people, from 248 to 203 million. This number is projected to decrease further to 163 million smokers by 2025 (Table 2.2).<sup>1</sup>

**Table 2.2 Estimated and Projected Number of Tobacco Smokers (in Millions), by WHO Region, Country Income Group, and Sex, 2000–2025**

Sex	WHO Region	Estimated					Projected		
		2000	2005	2010	2013	2015*	2020*	2025*	
<b>Male</b>	<b>Global</b>	<b>906</b>	<b>917</b>	<b>928</b>	<b>938</b>	<b>946</b>	<b>972</b>	<b>1,006</b>	
	African	38	46	56	65	73	97	129	
	Americas	55	52	49	48	47	44	42	
	Eastern Mediterranean	47	57	69	78	85	102	123	
	European	89	85	81	78	76	71	66	
	South-East Asia	215	213	211	213	214	217	220	
	Western Pacific	311	325	331	333	333	332	327	
	High-income OECD	151	140	129	123	119	108	99	
	<b>Female</b>	<b>Global</b>	<b>222</b>	<b>202</b>	<b>184</b>	<b>175</b>	<b>168</b>	<b>154</b>	<b>142</b>
	African	7	6	6	6	6	6	6	
	Americas	29	27	24	23	22	20	18	
	Eastern Mediterranean	7	6	6	6	6	6	6	
	European	31	31	29	28	28	26	25	
	South-East Asia	31	23	18	16	14	12	10	
	Western Pacific	20	18	17	16	15	14	13	
	High-income OECD	97	91	84	80	77	70	64	
<b>Both sexes</b>	<b>Global</b>	<b>1,128</b>	<b>1,119</b>	<b>1,112</b>	<b>1,113</b>	<b>1,114</b>	<b>1,126</b>	<b>1,147</b>	
	African	45	52	63	72	79	103	135	
	Americas	84	79	74	71	69	64	59	
	Eastern Mediterranean	54	63	75	84	90	108	129	
	European	120	116	110	106	104	97	91	
	South-East Asia	246	236	229	228	228	229	229	
	Western Pacific	331	343	348	349	348	346	340	
	High-income OECD	248	230	213	203	196	179	163	

Sex	World Bank country income group	Estimated					Projected		
		2000	2005	2010	2013	2015*	2020*	2025*	
<b>Male</b>	<b>Global</b>	<b>906</b>	<b>917</b>	<b>928</b>	<b>938</b>	<b>946</b>	<b>972</b>	<b>1,006</b>	
	High-income	193	182	172	166	162	151	143	
	Upper middle-income	392	403	408	409	409	408	405	
	Lower middle-income	252	261	274	286	295	321	351	
	Low-income	69	70	73	77	80	92	107	

Table 2.2 (continued)

Sex	World Bank country income group	Estimated					Projected	
		2000	2005	2010	2013	2015*	2020*	2025*
Female	Global	222	202	184	175	168	154	142
	High-income	112	106	99	95	91	85	78
	Upper middle-income	61	56	51	48	46	42	38
	Lower middle-income	38	31	26	24	23	20	18
	Low-income	12	10	8	8	7	7	7
Both sexes	Global	1,128	1,119	1,112	1,113	1,114	1,126	1,147
	High-income	305	288	271	260	253	236	221
	Upper middle-income	453	459	459	457	455	450	443
	Lower middle-income	290	292	301	310	318	341	369
	Low-income	80	80	82	85	88	99	114

\*Projections are shown for the years 2015, 2020, and 2025.

Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. Country income group classification based on World Bank Analytical Classifications for 2013.

Source: Based on data from World Health Organization 2015.<sup>1</sup> For more information, see the Statistical Annex.

Analyzing global data for 2013 by sex, there were just over five times as many male smokers (938 million) as female smokers (175 million) (Table 2.2). The majority of male adult smokers lived in the WHO Regions of the Western Pacific (333 million) and South-East Asia (213 million), accounting for 58% of all male smokers in the world. A very different picture emerges for females. Of the 175 million female smokers age 15 years and over in 2013, the large majority (80 million, or 46%) lived in high-income OECD countries. When using the World Bank country income groups, this proportion is even higher: 54% of female smokers globally live in high-income countries (HICs).<sup>1</sup> The lower prevalence of cigarette smoking among women in many LMICs and certain world regions results from many factors including low social acceptability of women's tobacco use, various sociocultural and religious factors, women's limited financial resources, and others.<sup>13</sup> However, in many LMICs, traditional constraints on women's tobacco use are likely to erode as women's social, legal, economic, and political status improves.<sup>14</sup> Evidence indicates that the influence of norms and traditions may already be weakening. For example, data from 14 countries that participated in the Global Adult Tobacco Survey (GATS)<sup>15</sup> show that women are increasingly initiating smoking at an age similar to that of men.<sup>16</sup> Thus, continued vigilance is warranted in order to avert a rise in smoking among women.

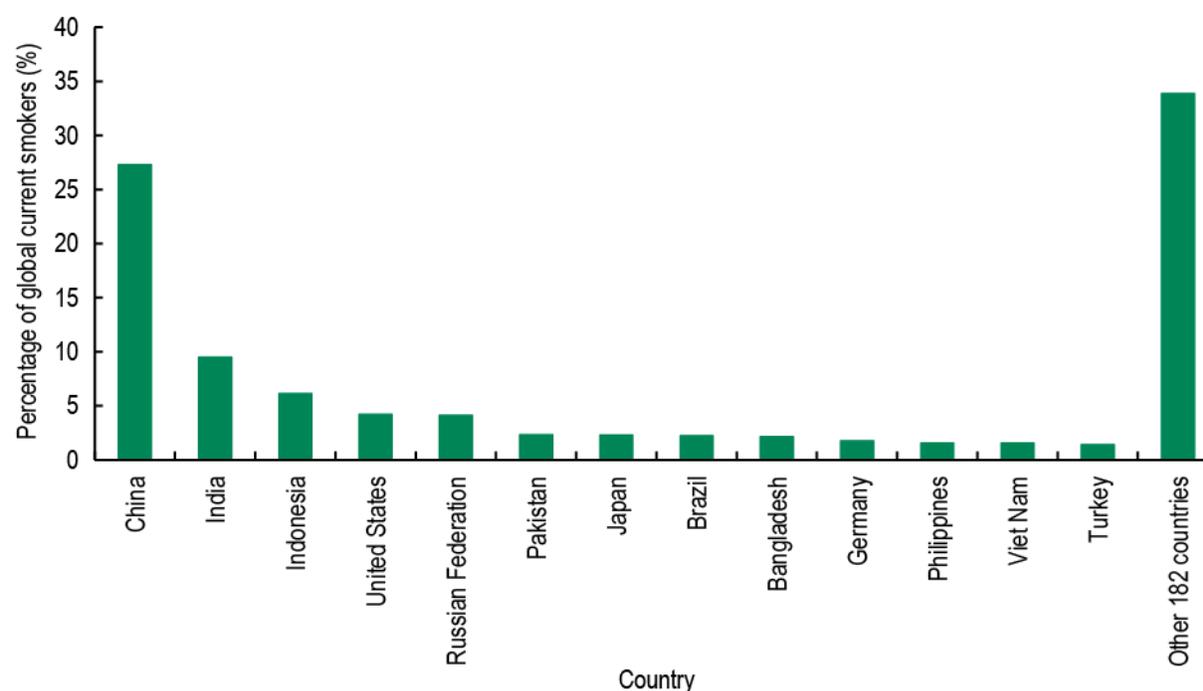
Fitted estimates to generate the underlying trends for most countries are also available in the *WHO Global Report on Trends in Prevalence of Tobacco Smoking, 2015*.<sup>1</sup> The data for 2013 indicate that nearly two-thirds of the world's smokers lived in just 13 countries (Bangladesh, Brazil, People's Republic of China, Germany, India, Indonesia, Japan, Pakistan, Philippines, Russian Federation, Turkey, United States, and Viet Nam) (Table 2.3 and Figure 2.3). These 13 countries accounted for a total of 736.3 million smokers (646.2 million males and 90.1 million females), with the remaining countries accounting for 376.9 million smokers.

**Table 2.3** Number of Current Tobacco Smokers Age 15 Years and Over (in Millions), by Country, 2013

Country	Males	Females	Both sexes
<b>Global</b>	<b>938.5</b>	<b>174.7</b>	<b>1,113.2</b>
Bangladesh	23.1	0.4	23.6
Brazil	15.0	9.5	24.6
China	292.1	11.5	303.5
Germany	10.6	8.7	19.3
India	96.7	8.5	105.2
Indonesia	64.7	3.1	67.8
Japan*	19.5	5.8	25.3
Pakistan	23.9	1.8	25.7
Philippines	14.4	2.6	17.0
Russian Federation	32.6	12.8	45.4
Turkey	11.5	3.8	15.3
United States*	25.7	21.0	46.7
Viet Nam	16.4	0.5	16.9
Other 182 countries	292.3	84.6	376.9

\*Data for cigarette smokers only.

Source: World Health Organization 2015.<sup>1</sup>

**Figure 2.3** Percentage of Global Current Tobacco Smokers Age 15 Years and Over, by Country, 2013


Note: Data for the United States and Japan only include cigarette smokers.

Source: World Health Organization 2015.<sup>1</sup>

The majority of the male smokers of the world, 292.1 million (31.1%), live in China. Although the prevalence of smoking among women in China is relatively low, the sheer size of its population gives China the third-largest number of female smokers (11.5 million), after the United States (21.0 million) and the Russian Federation (12.8 million).<sup>1</sup>

### Daily and Non-daily Smoking Among Adults

Current tobacco smoking includes both daily and non-daily (i.e., occasional) smoking. Differences in smoking behavior, such as daily versus non-daily smoking, may result from different patterns of tobacco dependence as well as cultural, social, economic, and environmental influences. As depicted in Table 2.4 and Figure 2.4, WHO estimated that in 2013, world prevalence of current tobacco smoking was 21.2% (35.8% for males and 6.6% for females). The large majority of current tobacco smokers (83.0%) used tobacco daily; 83.9% of male current smokers and 77.8% of female current smokers were daily smokers.<sup>1</sup>

**Table 2.4 Percentage of People Age 15 Years and Over Who Currently Smoke Tobacco Daily and Non-daily, by WHO Region and Country Income Group, 2013**

Sex	WHO Region	Prevalence of smoking			Proportion of daily to current
		Current	Daily	Non-daily	
Male	Global	35.8	30.0	5.8	83.9
	African	24.7	19.1	5.6	77.4
	Americas	22.8	15.9	6.8	70.0
	Eastern Mediterranean	36.8	30.9	6.0	83.8
	European	48.5	41.3	7.2	85.1
	South-East Asia	31.7	27.5	4.2	86.8
	Western Pacific	49.4	42.3	7.1	85.6
	High-income OECD	28.6	23.7	5.0	82.6
	Female	Global	6.6	5.2	1.5
African		2.3	1.6	0.6	71.4
Americas		10.4	7.4	3.0	70.9
Eastern Mediterranean		2.8	2.1	0.8	73.2
European		15.6	12.1	3.5	77.5
South-East Asia		2.4	1.9	0.5	78.0
Western Pacific		2.4	2.0	0.4	82.2
High-income OECD		17.7	14.1	3.6	79.8

Table 2.4 (continued)

Sex	WHO Region	Prevalence of smoking			Proportion of daily to current
		Current	Daily	Non-daily	
<b>Both sexes</b>	<b>Global</b>	<b>21.2</b>	<b>17.6</b>	<b>3.6</b>	<b>83.0</b>
	African	13.4	10.3	3.1	76.8
	Americas	16.4	11.5	4.9	70.3
	Eastern Mediterranean	20.4	16.9	3.4	83.1
	European	31.0	25.7	5.3	83.1
	South-East Asia	17.2	14.9	2.4	86.2
	Western Pacific	26.4	22.6	3.9	85.4
	High-income OECD	23.0	18.8	4.3	81.5

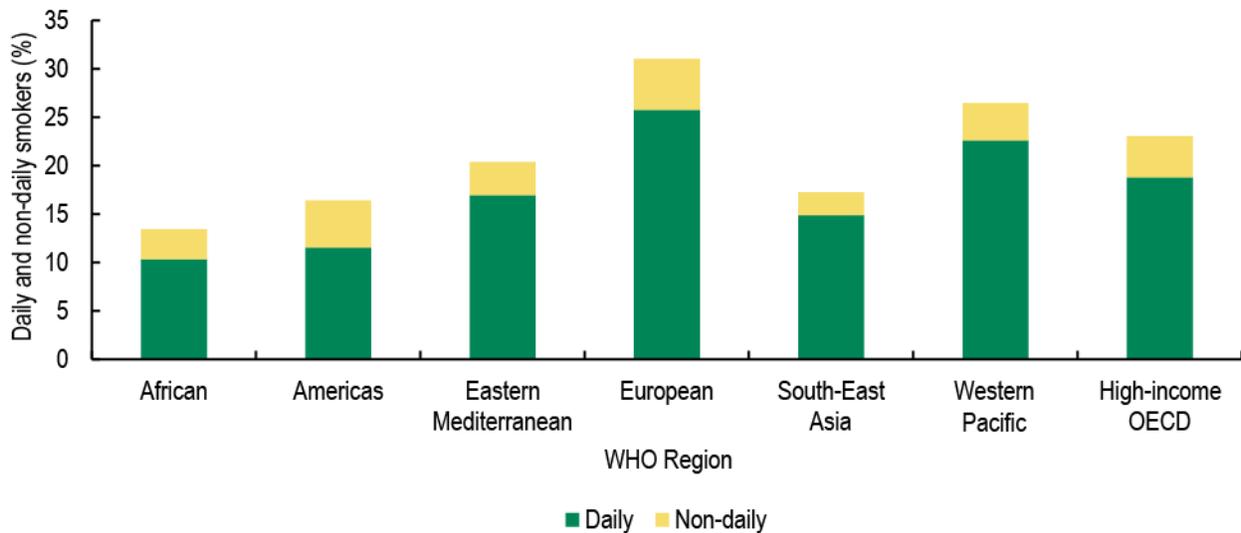
  

Sex	World Bank country income group	Prevalence of smoking			Proportion of daily to current
		Current	Daily	Non-Daily	
<b>Male</b>	<b>Global</b>	<b>35.8</b>	<b>30.0</b>	<b>5.8</b>	<b>83.9</b>
	High-income	32.1	26.8	5.3	83.5
	Upper middle-income	42.4	35.7	6.7	84.3
	Lower middle-income	32.3	27.3	5.0	84.5
	Low-income	30.2	24.5	5.7	81.0
<b>Female</b>	<b>Global</b>	<b>6.6</b>	<b>5.2</b>	<b>1.5</b>	<b>77.8</b>
	High-income	17.5	13.9	3.6	79.7
	Upper middle-income	5.1	3.9	1.2	76.5
	Lower middle-income	2.8	2.1	0.7	75.1
	Low-income	2.9	2.1	0.8	71.1
<b>Both sexes</b>	<b>Global</b>	<b>21.2</b>	<b>17.6</b>	<b>3.6</b>	<b>83.0</b>
	High-income	24.6	20.2	4.4	82.1
	Upper middle-income	23.8	19.9	3.9	83.4
	Lower middle-income	17.7	14.8	2.9	83.8
	Low-income	16.4	13.1	3.3	80.1

Notes: Current smoking is the sum of the prevalences of daily and non-daily smoking. WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. Country income group classification based on World Bank Analytical Classifications for 2013.

Source: World Health Organization 2015.<sup>1</sup>

**Figure 2.4** Percentage of People Age 15 Years and Over Who Currently Smoke Tobacco Daily and Non-daily, by WHO Region, 2013



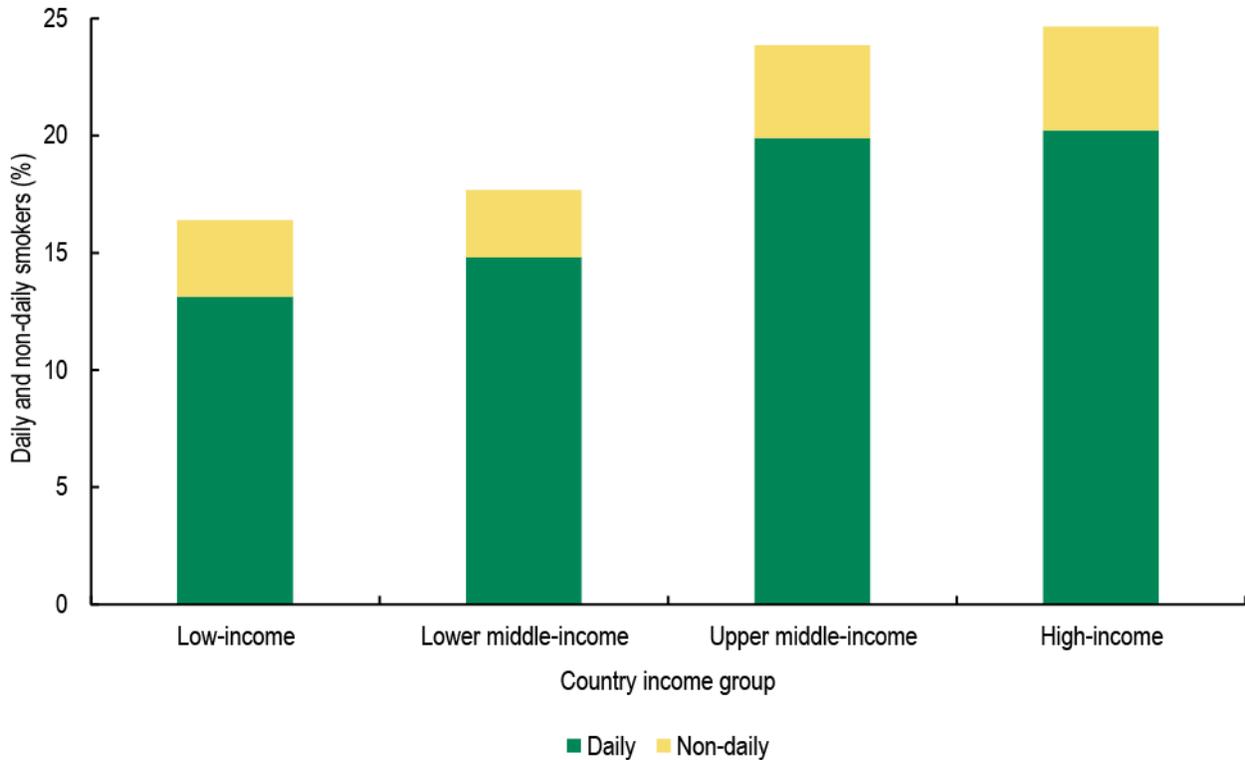
Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions.

Source: World Health Organization 2015.<sup>1</sup>

Among males, the proportion of daily to current smokers was higher in the Eastern Mediterranean, European, South-East Asia, and Western Pacific Regions, with values ranging between 84% and 87%. In contrast, 70% of male current smokers in the Region of the Americas and 77% in the African Region were daily smokers. Among females, the proportion of daily to current smokers was higher than 80% in the Western Pacific Region only, whereas the proportion for all other Regions ranged between 71% and 78%.<sup>1</sup>

The above pattern was essentially replicated when using World Bank country income group categories (Table 2.4 and Figure 2.5). The proportion of daily to current tobacco smoking was lowest in low-income countries for both males and females.

**Figure 2.5** Percentage of People Age 15 Years and Over Who Currently Smoke Tobacco Daily and Non-daily, by Country Income Group, 2013



*Note:* Country income group classification based on World Bank Analytical Classifications for 2013.  
*Source:* World Health Organization 2015.<sup>1</sup>

Table 2.5 and Figure 2.6 show data derived from GATS. For data on adult tobacco use in the United States, NATS was used. Analysis of data in this figure and table provides a largely consistent picture of daily versus current tobacco smoking. The proportion of daily to current smoking was about 75% or greater in 23 of the 27 countries that had undertaken the survey. Exceptions to the overall picture were the United States and Romania (both at about 61%) and two Central American countries, Mexico and Panama (below 50%). This means that for most countries included in the analysis, the majority of smokers are daily smokers.

**Table 2.5** Percentage of People Age 15 Years and Over Who Currently Smoke Tobacco Daily, in Selected Countries, by Sex, 2008–2014

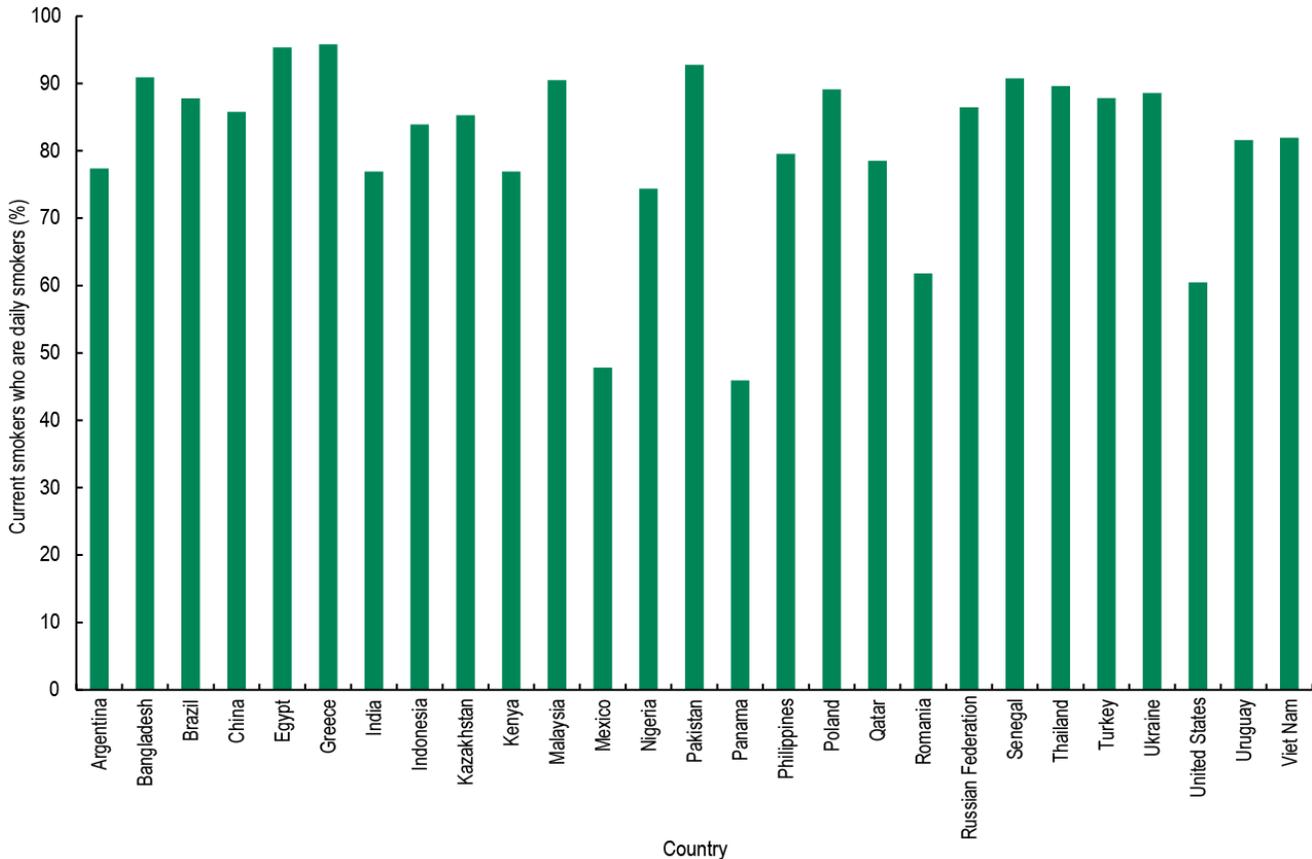
Country	Both sexes			Males			Females		
	Current	Daily	Daily to current	Current	Daily	Daily to current	Current	Daily	Daily to current
Argentina	22.1	17.1	77.4	29.4	21.9	74.5	15.6	12.7	81.4
Bangladesh	23.0	20.9	90.9	44.7	40.7	91.1	1.5	1.3	86.7
Brazil	17.2	15.1	87.8	21.6	18.9	87.5	13.1	11.5	87.8
China	28.1	24.1	85.8	52.9	45.4	85.8	2.4	2.0	83.3
Egypt	19.4	18.5	95.4	37.7	35.8	95.0	0.5	0.5	100.0
Greece	38.2	36.6	95.8	51.2	49.7	97.1	25.7	23.9	93.0
India	14.0	10.7	76.4	24.3	18.3	75.3	2.9	2.4	82.8
Indonesia	34.8	29.2	83.9	67.0	56.7	84.6	2.7	1.8	66.7
Kazakhstan	22.4	19.1	85.3	42.4	36.9	87.0	4.5	3.2	71.1
Kenya	7.8	6.0	76.9	15.1	11.6	76.8	0.8	0.6	75.0
Malaysia	23.1	20.9	90.5	43.9	39.9	90.9	1.0	0.7	70.0
Mexico	15.9	7.6	47.8	24.8	11.8	47.6	7.8	3.7	47.4
Nigeria	3.9	2.9	74.4	7.3	5.6	76.7	0.4	0.3	75.0
Pakistan	12.4	11.5	92.7	22.2	20.6	92.8	2.1	2.0	95.2
Panama	6.1	2.8	45.9	9.4	4.4	46.8	2.8	1.2	42.9
Philippines	28.3	22.5	79.5	47.7	38.2	80.1	9.0	6.9	76.7
Poland	30.3	27.0	89.1	36.9	33.5	90.8	24.4	21.0	86.1
Qatar	12.1	9.5	78.5	20.2	16.5	81.7	3.1	1.7	54.8
Romania	26.7	16.5	61.8	37.4	17.6	47.1	16.7	14.1	84.4
Russian Federation	39.1	33.8	86.4	60.2	55.0	91.4	21.7	16.3	75.1
Senegal	5.4	4.9	90.7	10.7	9.7	90.7	0.4	0.3	75.0
Thailand	24.0	21.5	89.6	46.6	42.0	90.1	2.6	2.1	80.8
Turkey	27.1	23.8	87.8	41.5	37.3	89.9	13.1	10.7	81.7
Ukraine	28.8	25.5	88.5	50.0	45.4	90.8	11.2	8.9	79.5
United States*	22.3	13.7	61.4	27.0	15.5	57.4	18.1	12.1	66.9
Uruguay	25.0	20.4	81.6	30.7	24.8	80.8	19.8	16.4	82.8
Viet Nam	23.8	19.5	81.9	47.4	38.7	81.6	1.4	1.2	85.7

\*Shows data for smokers age 18 years and older from the U.S. National Adult Tobacco Survey.

Note: Current smoking is the sum of the prevalences of daily and non-daily smoking.

Sources: Global Adult Tobacco Survey 2008–2014.<sup>15</sup> National Adult Tobacco Survey 2013–2014.<sup>4</sup>

**Figure 2.6** Percentage of Current Smokers Age 15 Years and Over Who are Daily Tobacco Smokers, by Country, 2008–2014



Notes: Current smoking is the sum of the prevalences of daily and non-daily smoking. Data presented for the United States is for smokers age 18 and older based on the National Adult Tobacco Survey.

Sources: Global Adult Tobacco Survey 2008–2014.<sup>15</sup> National Adult Tobacco Survey 2013–2014.<sup>4</sup>

In addition to daily tobacco smoking, another good indicator of addictiveness and tobacco dependence is the average number of cigarettes smokers use daily (Table 2.6).

The GATS data suggest that, on average, daily smokers consume 10 or more cigarettes per day. India reported the lowest average number of cigarettes smoked per day per smoker (6.2 cigarettes per day), but the population of India is known to use ST heavily. The average number of cigarettes smoked per day by women in India (7.0) was nominally higher than average use by Indian men (6.1). Although the reported overall prevalence for women for many of the countries was low, mean cigarettes per day of those who did smoke was quite high in some countries.<sup>15</sup>

**Table 2.6 Mean Number of Cigarettes Smoked Per Day Per Smoker, 2008–2014**

Country	Males	Females	Both sexes
Argentina	16.6	13.0	15.2
Bangladesh*	5.2	0.8	5.1
China	14.3	10.6	14.2
Egypt	19.3	—	19.4
Greece	21.3	16.8	19.8
India	6.1	7.0	6.2
Indonesia	13.0	8.1	12.8
Kazakhstan	15.2	11.8	14.9
Malaysia	14.0	—	13.9
Mexico	9.7	8.4	9.4
Nigeria	8.0	—	8.3
Pakistan	13.7	10.3	13.6
Panama	16.3	10.1	14.8
Philippines	11.3	7.0	10.6
Qatar*	17.6	10.9	17.2
Romania	17.7	14.1	16.6
Russian Federation*	18.4	12.6	16.9
Thailand	10.0	9.3	10.0
Turkey	20.3	15.3	19.2
Ukraine	18.2	11.8	16.9
United States	17.0	14.0	15.6
Viet Nam	13.6	10.9	13.5

\*Data shown refer to average number of cigarettes smoked by current (daily or non-daily) cigarette smokers. For all other countries, the average number of cigarettes smoked by daily smokers is presented.

Sources: Global Adult Tobacco Survey 2008–2014.<sup>15</sup> National Adult Tobacco Survey 2013–2014.<sup>4</sup>

### Current Cigarette Smoking Among Youth

Information on use of tobacco products by youth was drawn from the Global Youth Tobacco Surveys<sup>5</sup> and the Health Behaviour in School-Aged Children surveys.<sup>6</sup> Adjustments were made to account for the fact that the GYTS captures information on youth ages 13–15 years, and the HBSC surveys youth ages 11, 13, and 15 years. In addition, the GYTS reports information on cigarette smoking and smokeless tobacco use, and the HBSC captures information on smoked tobacco (including cigarettes). For data on tobacco use by youth in the United States, the National Youth Tobacco Survey<sup>7</sup> was used.

Using both GYTS and HBSC data for the period 2007–2014 applied to the 2010 population (Table 2.7 and Figure 2.7), an estimated 7.0% of youth ages 13–15 years worldwide smoked cigarettes. The prevalence of cigarette smoking for boys (9.4%) was over 2 times that for girls (4.5%). Excluding youth from the high-income OECD countries, youth from the Americas (13.0%) and European (9.8%) Regions had the highest prevalence of cigarette smoking compared with youth from any other region.

**Table 2.7 Prevalence of Cigarette Smoking Among Youth Ages 13–15 Years, by WHO Region and Country Income Group, 2007–2014**

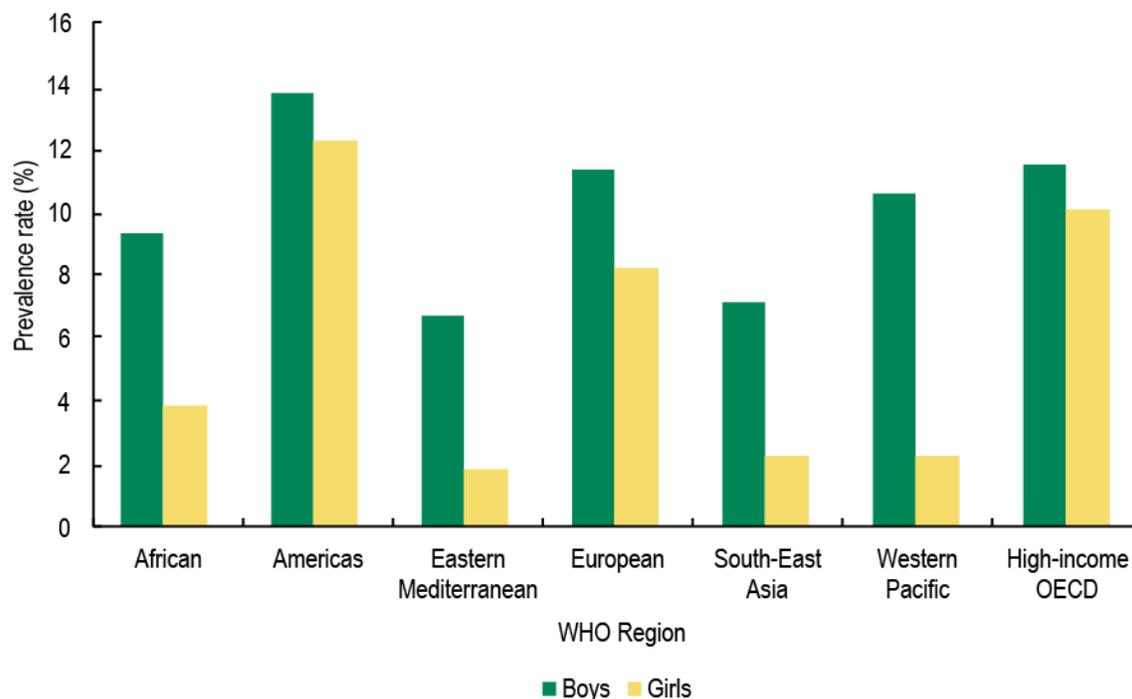
WHO Region	Estimated prevalence (%)			Number of smokers (in thousands)		
	Boys	Girls	Both sexes	Boys	Girls	Both sexes
<b>Global</b>	<b>9.4</b>	<b>4.5</b>	<b>7.0</b>	<b>17,148</b>	<b>7,658</b>	<b>24,806</b>
African	9.3	3.8	6.6	2,788	1,126	3,914
Americas	13.7	12.2	13.0	2,272	1,954	4,226
Eastern Mediterranean	6.7	1.8	4.3	1,255	317	1,572
European	11.3	8.2	9.8	964	675	1,639
South-East Asia	7.1	2.2	6.6	3,847	1,079	4,926
Western Pacific	10.5	2.2	6.6	3,846	713	4,559
High-income OECD	11.5	10.0	7.0	2,175	1,795	3,970

World Bank country income group	Estimated prevalence (%)			Number of smokers (in thousands)		
	Boys	Girls	Both sexes	Boys	Girls	Both sexes
<b>Global</b>	<b>9.4</b>	<b>4.5</b>	<b>7.0</b>	<b>17,148</b>	<b>7,658</b>	<b>24,806</b>
High-income	11.7	9.9	10.9	2,420	1,940	4,359
Upper middle-income	11.6	5.6	8.7	6,810	3,037	9,846
Lower middle-income	7.5	2.6	5.1	6,340	2,016	8,356
Low-income	8.0	3.4	5.7	1,579	666	2,245

Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. The number of users was calculated by applying the prevalence rates to the estimates provided for the year 2010 by the United Nations. Country income group classification based on World Bank Analytical Classifications for 2014.

Sources: Global Youth Tobacco Survey 2007–2014.<sup>5</sup> Health Behaviour in School-Aged Children 2013–2014.<sup>6</sup>

**Figure 2.7** Prevalence of Current Cigarette Smoking Among Youth, by WHO Region, 2007–2014

Notes: WHO = World Health Organization. OECD = high-income countries as defined by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. The number of users was calculated by applying the prevalence rates to the United Nations–provided population estimates for the year 2010.

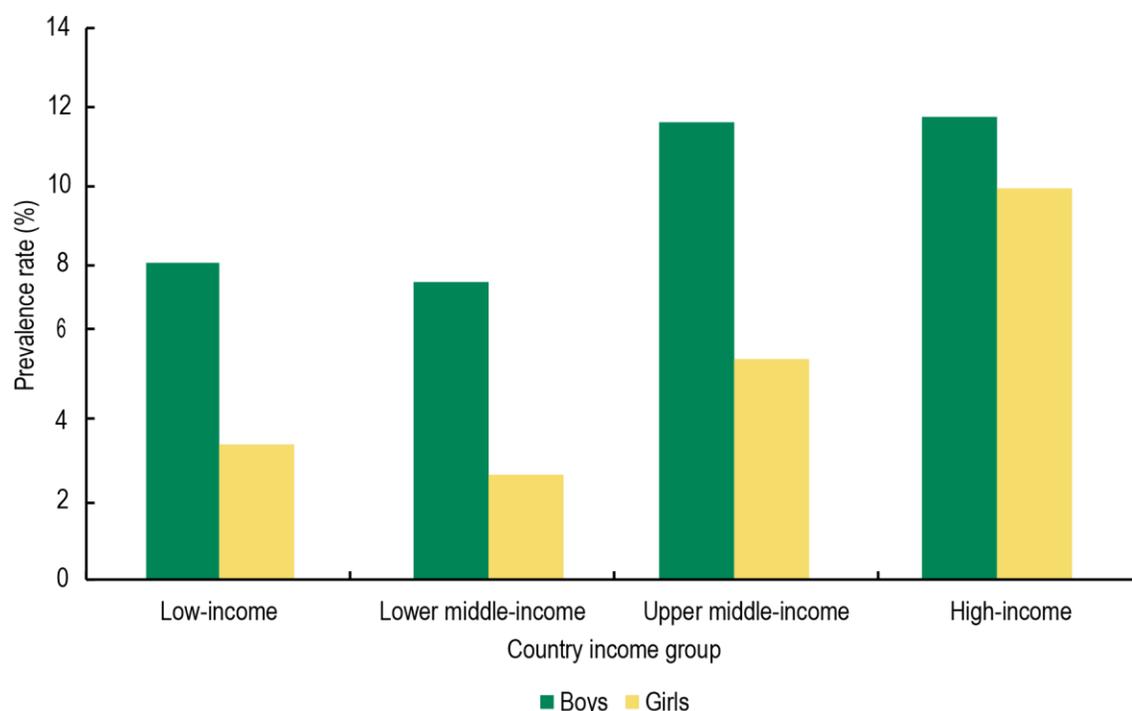
Sources: Global Youth Tobacco Survey 2007–2014.<sup>5</sup> Health Behaviour in School-Aged Children 2013–2014.<sup>6</sup>

Youth from the Eastern Mediterranean Region had the lowest prevalence of cigarette smoking (4.3%). However, use of other smoked products—especially waterpipe use—is common in this region. An analysis of GYTS data since 2006 shows that when all smoked products are included, prevalence of tobacco smoking in youth of the Eastern Mediterranean Region increases to 8.2%, around double that of cigarette smoking alone. A similar analysis was also conducted for the South-East Asia Region, where products such as bidis or kreteks are known to be popular; this analysis found an all-tobacco smoking prevalence rate of 9.1%, which was almost double the 4.7% rate for cigarette smoking alone.<sup>5</sup>

As shown in Figure 2.8, the prevalence of current cigarette smoking among boys and girls in HICs was not only relatively high, the difference between prevalence among boys and girls in HICs was much smaller than in other country income groups, where boys had a much higher current smoking prevalence than girls.

The analyses undertaken for this monograph raise further concern about the relative increase in tobacco use by girls. Although the ratio of the 2013 prevalence rate for smoking by men in the Western Pacific Region (49.4%) compared to the prevalence of smoking among women in that region (2.4%; Table 2.1) was 20.6, the corresponding ratio between smoking prevalences for boys and girls in that region was only about 5.0. Similarly, for the South-East Asia Region, the ratio of smoking prevalences for men and women was 13.2, while the boys-to-girls ratio was only 4.6. And in the African Region, the men-to-women smoking ratio was 10.7 compared with a boys-to-girls ratio of 2.6. These results indicate that in the future, the burden of tobacco use in men and women will be more similar than it is today.

**Figure 2.8** Prevalence of Current Cigarette Smoking Among Youth, by Country Income Group, 2007–2014



Notes: Country income group classification based on World Bank Analytical Classifications for 2014. The number of users was calculated by applying the prevalence rates to the United Nations–provided population estimates for the year 2010.

Sources: Global Youth Tobacco Survey 2007–2014.<sup>5</sup> Health Behaviour in School-Aged Children 2013–2014.<sup>6</sup>

### Global Cigarette Consumption

Using data from Euromonitor International,<sup>12</sup> WHO found that the world’s smokers consumed more than 5.6 trillion cigarettes in 2013, compared with 5.2 trillion cigarettes in 2000 (Table 2.8, Figure 2.9)—an increase of 437 billion sticks, or an 8.4% increase in total cigarette consumption since 2000 (though this rising trend may be leveling off). This change is equivalent to an absolute increase of 33.6 billion sticks per year. In 2013, total annual cigarette consumption was highest in the Western Pacific Region (2.7 trillion), followed by the high-income OECD countries (1.1 trillion) and the European Region (0.7 trillion) (Table 2.8). Together, countries in these three areas accounted for 80% of global cigarette consumption.

The global increase in consumption was substantially higher during the period that preceded the entry into force of the WHO Framework Convention on Tobacco Control (WHO FCTC) on February 27, 2005. Between 2000 and 2005, the increase was 49.4 billion sticks per year, compared with an increase of only 23.8 billion per year between 2005 and 2013. In the high-income OECD countries in the years 2000–2005, average cigarette consumption declined by 37.2 billion sticks per year (from 1,669 billion sticks in 2000 to 1,483 billion sticks in 2005). In contrast, these countries experienced an average reduction of 47.0 billion sticks per year in the years 2005 through 2013. In the Region of the Americas (excluding Canada and the United States, which are high-income OECD countries) the volume of cigarettes consumed in 2000 was 242 billion sticks, which increased rapidly to 270 billion sticks in 2001, after which the volume remained relatively stable through 2005. Since 2005 the volume of cigarettes consumed in the Americas has declined steadily, reaching 210 billion sticks in

2013. In the European Region (again, excluding high-income OECD countries), annual consumption increased rapidly from 690 billion sticks in 2000 to a high of 856 billion sticks in 2008 and has consistently declined since then, reaching 706 billion sticks in 2013 (Table 2.8).<sup>12</sup>

**Table 2.8 Global Consumption of Cigarette Sticks (in Billions), by WHO Region and Country Income Group, 2000–2013**

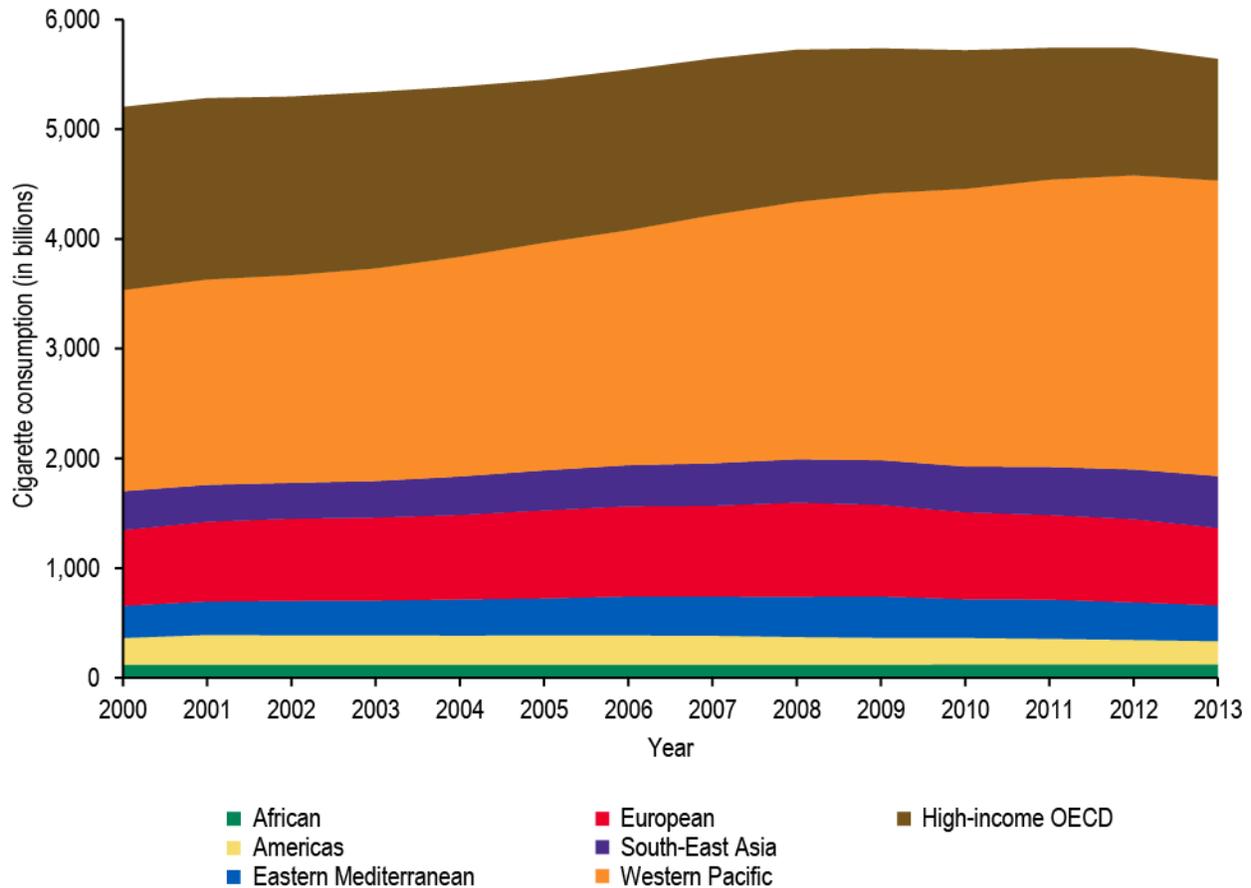
WHO Region	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Global</b>	<b>5,204</b>	<b>5,284</b>	<b>5,299</b>	<b>5,340</b>	<b>5,389</b>	<b>5,451</b>	<b>5,543</b>	<b>5,645</b>	<b>5,725</b>	<b>5,738</b>	<b>5,721</b>	<b>5,742</b>	<b>5,743</b>	<b>5,641</b>
African	123	122	123	123	121	122	121	121	122	123	124	125	126	126
Americas	242	270	265	267	266	268	267	264	252	244	241	232	221	210
Eastern Mediterranean	293	304	315	316	329	335	354	356	367	377	352	357	342	326
European	690	727	749	756	770	803	822	828	856	834	792	770	758	706
South-East Asia	354	336	326	334	351	365	375	386	396	408	418	438	454	471
Western Pacific	1,834	1,873	1,893	1,939	2,003	2,076	2,142	2,263	2,346	2,432	2,531	2,619	2,681	2,695
High-income OECD	1,669	1,652	1,627	1,607	1,549	1,483	1,461	1,425	1,386	1,320	1,262	1,200	1,162	1,107

World Bank country income group	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Global</b>	<b>5,204</b>	<b>5,284</b>	<b>5,299</b>	<b>5,340</b>	<b>5,389</b>	<b>5,451</b>	<b>5,543</b>	<b>5,645</b>	<b>5,725</b>	<b>5,738</b>	<b>5,721</b>	<b>5,742</b>	<b>5,743</b>	<b>5,641</b>
High-income	2,040	2,034	2,016	1,997	1,948	1,906	1,896	1,854	1,837	1,766	1,700	1,633	1,592	1,514
Upper middle-income	2,381	2,454	2,472	2,515	2,588	2,653	2,727	2,833	2,918	2,991	3,041	3,134	3,178	3,165
Lower middle-income	670	688	699	716	741	777	802	836	841	847	843	837	830	820
Low-income	113	108	111	113	113	115	118	123	129	134	137	139	143	143

Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. Country income group classification based on World Bank Analytical Classifications for 2013.

Source: Euromonitor International 2016.<sup>12</sup>

**Figure 2.9 Global Consumption of Cigarette Sticks (in Billions), by WHO Region, 2000–2013**


Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions.

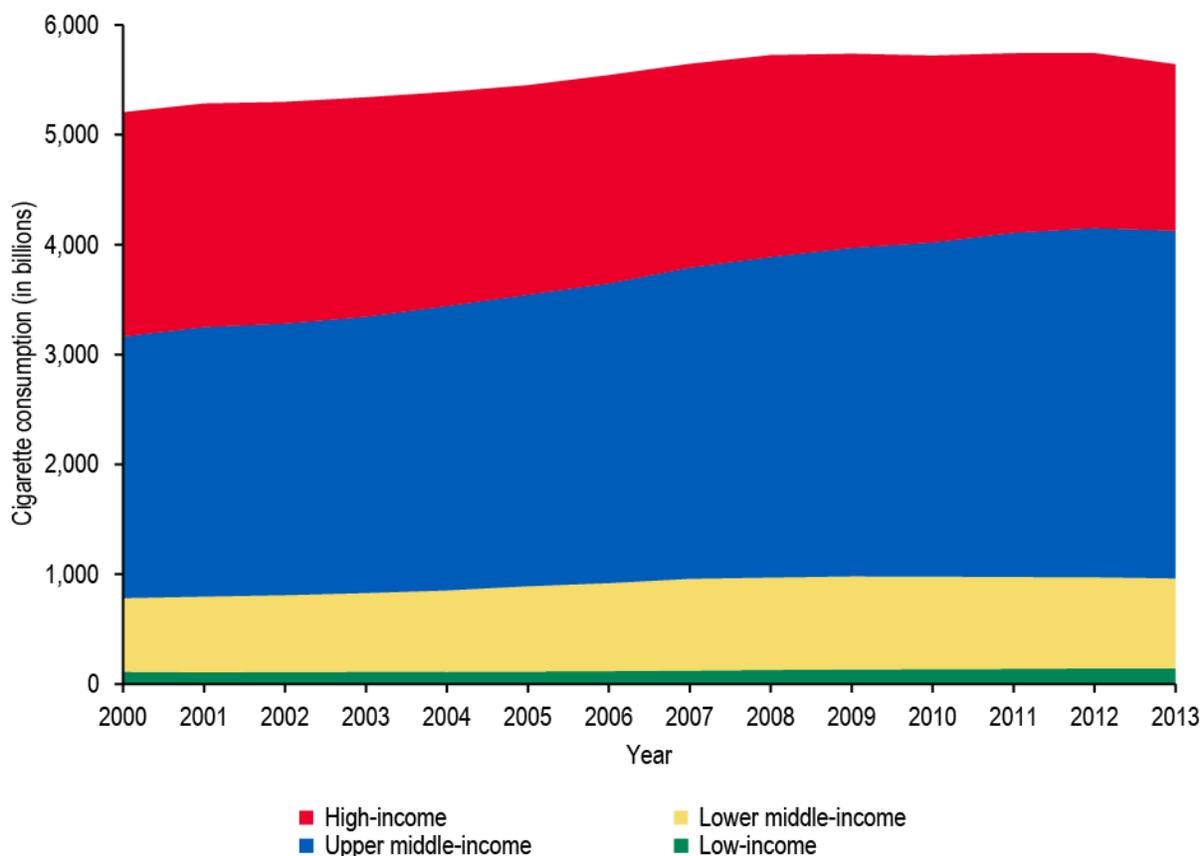
Source: Euromonitor International 2016.<sup>12</sup>

The African Region has experienced a subtle but visible increase in the recent past. During the period 2000–2009, between 121 and 123 billion sticks were consumed each year. Since 2008, consumption has increased steadily, reaching 126 billion sticks in 2013. The Eastern Mediterranean Region has also experienced an interesting change. Between 2000 and 2009, consumption in the Eastern Mediterranean Region increased steadily from 293 billion sticks to 377 billion sticks, after which consumption declined to 326 billion sticks in 2013. However, the Eastern Mediterranean Region has been subject to substantial political turmoil and conflict in the past few years, and the resulting breakdown in law and order in several Member States appears to have resulted in substantial importation of illicit cigarettes.<sup>17</sup> In addition, use of waterpipes has increased substantially in this region, and large numbers of cigarette smokers may have switched to waterpipes in the recent past.

The remaining two regions, by far the most populous regions of the world, have experienced substantial increases in consumption—a 33.1% increase in South-East Asia, from 354 billion sticks consumed in 2000 to 471 billion sticks in 2013, and a 47.0% increase in the Western Pacific (excluding high-income OECD countries such as Australia, Japan, Republic of Korea, and others), from 1,834 billion sticks consumed in 2000 to 2,695 billion sticks in 2013.<sup>12</sup>

The trends in cigarette consumption by WHO Region are consistent with trends in consumption by World Bank country income group (Figure 2.10). Annual cigarette consumption decreased by 25.5% in HICs, from 2,040 billion sticks consumed in 2000 to 1,514 billion sticks in 2013. In contrast, consumption increased in all other country income groups. Consumption in low-income countries increased by 26.3% from 2000 to 2013; most of this increase occurred between 2005 and 2013. From 2000 through 2005, consumption remained relatively unchanged at around 113 billion sticks. In lower middle-income countries consumption increased rapidly between 2000 and 2009 from 670 billion sticks to 847 billion sticks. After 2009, consumption declined, reaching 820 billion sticks in 2013. Upper middle-income countries, which account for 56.1% of global consumption, experienced an 11.4% increase between 2000 and 2005 compared with a 19.3% increase in the period 2005–2013.<sup>12</sup>

**Figure 2.10 Global Consumption of Cigarette Sticks (in Billions), by Country Income Group, 2000–2013**



Note: Country income group classification based on World Bank Analytical Classifications for 2013.

Source: Euromonitor International 2016.<sup>12</sup>

### Global Cigarette Consumption Per Capita

As shown in Table 2.9 and Figure 2.11, annual per capita cigarette consumption among people age 15 and older around the world has declined steadily since 2000. The major driver of that reduction has been the decline in per capita consumption in high-income OECD countries, from 2,246 cigarettes per person in 2000 to 1,459 cigarettes per person in 2013. Per capita consumption also declined in the Region of the Americas (excluding Canada and the United States, which are high-income OECD countries), from 894 in 2000 to 587 in 2013. In the African Region, despite a small increase in overall

consumption in the region, per capita consumption fell from 379 cigarettes per person in 2000 to 255 per person in 2013. On the other hand, two regions experienced large increases: In the European Region, excluding high-income OECD countries, per capita consumption increased from 1,984 cigarettes per person in 2000 to 2,322 cigarettes per person in 2013; and in the Western Pacific Region, from 1,661 cigarettes per person in 2000 to 1,965 cigarettes per person in 2013.<sup>12</sup>

**Table 2.9 Per Capita Consumption of Cigarette Sticks Among People Age 15 Years and Older, by WHO Region and Country Income Group, 2000–2013**

WHO Region	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Global</b>	<b>1,226</b>	<b>1,222</b>	<b>1,203</b>	<b>1,190</b>	<b>1,179</b>	<b>1,171</b>	<b>1,171</b>	<b>1,174</b>	<b>1,172</b>	<b>1,157</b>	<b>1,137</b>	<b>1,125</b>	<b>1,110</b>	<b>1,077</b>
African	379	362	348	333	323	317	306	294	287	279	272	265	260	255
Americas	894	864	816	706	774	745	736	718	710	696	677	634	603	587
Eastern Mediterranean	889	881	887	1,028	1,033	1,036	1,007	1,016	1,004	1,029	1,005	1,008	1,008	918
European	1,984	2,018	2,030	2,147	2,245	2,295	2,299	2,326	2,409	2,453	2,458	2,529	2,454	2,322
South-East Asia	361	339	336	340	316	301	301	311	317	320	324	326	329	332
Western Pacific	1,661	1,653	1,671	1,681	1,685	1,669	1,673	1,695	1,724	1,751	1,823	1,864	1,909	1,965
High-income OECD	2,246	2,213	2,127	2,094	2,055	2,007	1,965	1,879	1,782	1,742	1,686	1,625	1,537	1,459

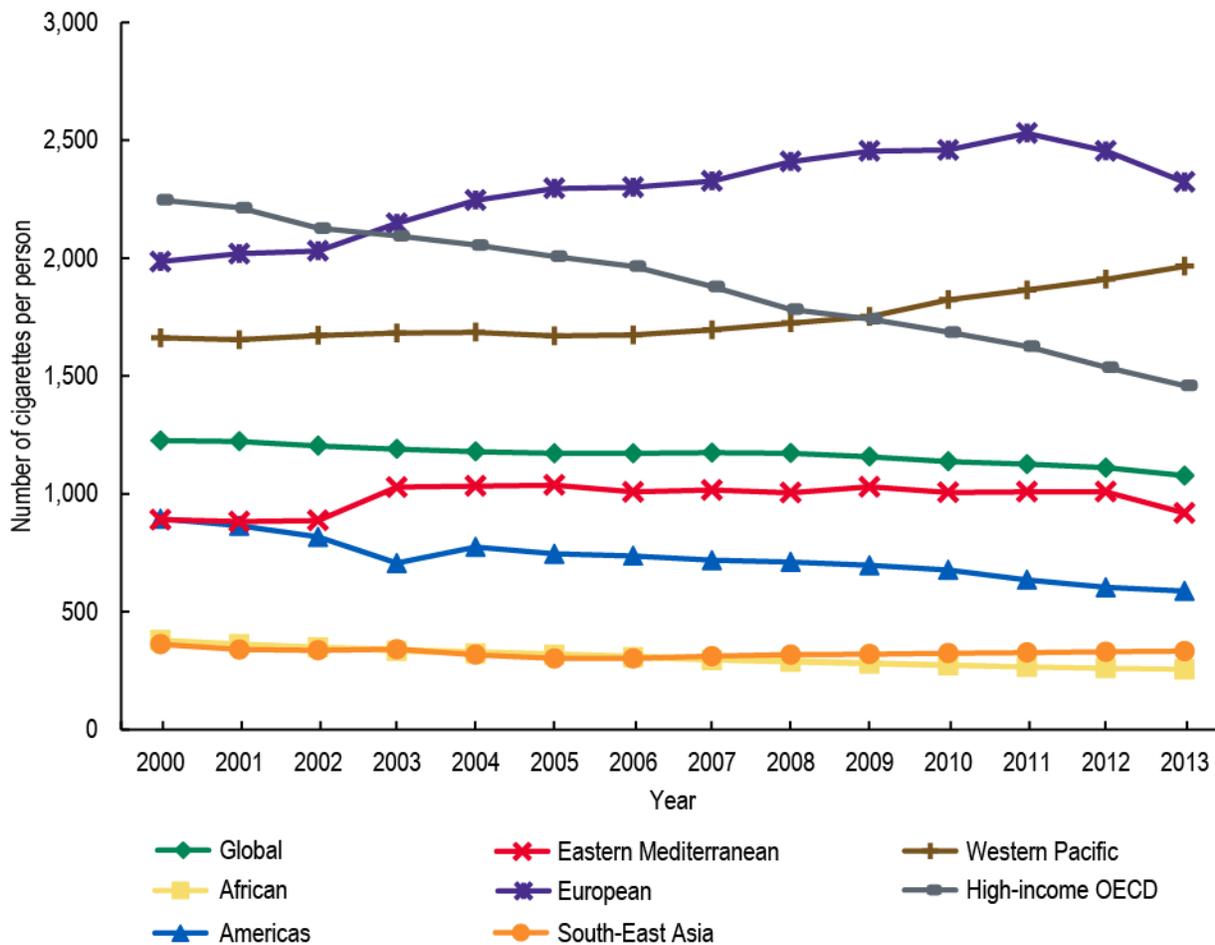
  

World Bank country income group	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Global</b>	<b>1,226</b>	<b>1,222</b>	<b>1,203</b>	<b>1,190</b>	<b>1,179</b>	<b>1,171</b>	<b>1,171</b>	<b>1,174</b>	<b>1,172</b>	<b>1,157</b>	<b>1,137</b>	<b>1,125</b>	<b>1,110</b>	<b>1,077</b>
High-income	2,142	2,117	2,080	2,041	1,973	1,913	1,886	1,828	1,795	1,712	1,636	1,562	1,514	1,433
Upper middle-income	1,509	1,526	1,507	1,502	1,516	1,526	1,544	1,580	1,606	1,625	1,633	1,665	1,672	1,650
Lower middle-income	498	501	497	499	505	518	524	535	528	522	509	496	483	469
Low-income	305	286	285	283	274	272	273	279	285	288	287	284	284	276

Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. Country income group classification based on World Bank Analytical Classifications for 2013.

Source: Based on data from Euromonitor International 2016.<sup>12</sup> For more information, see the Statistical Annex.

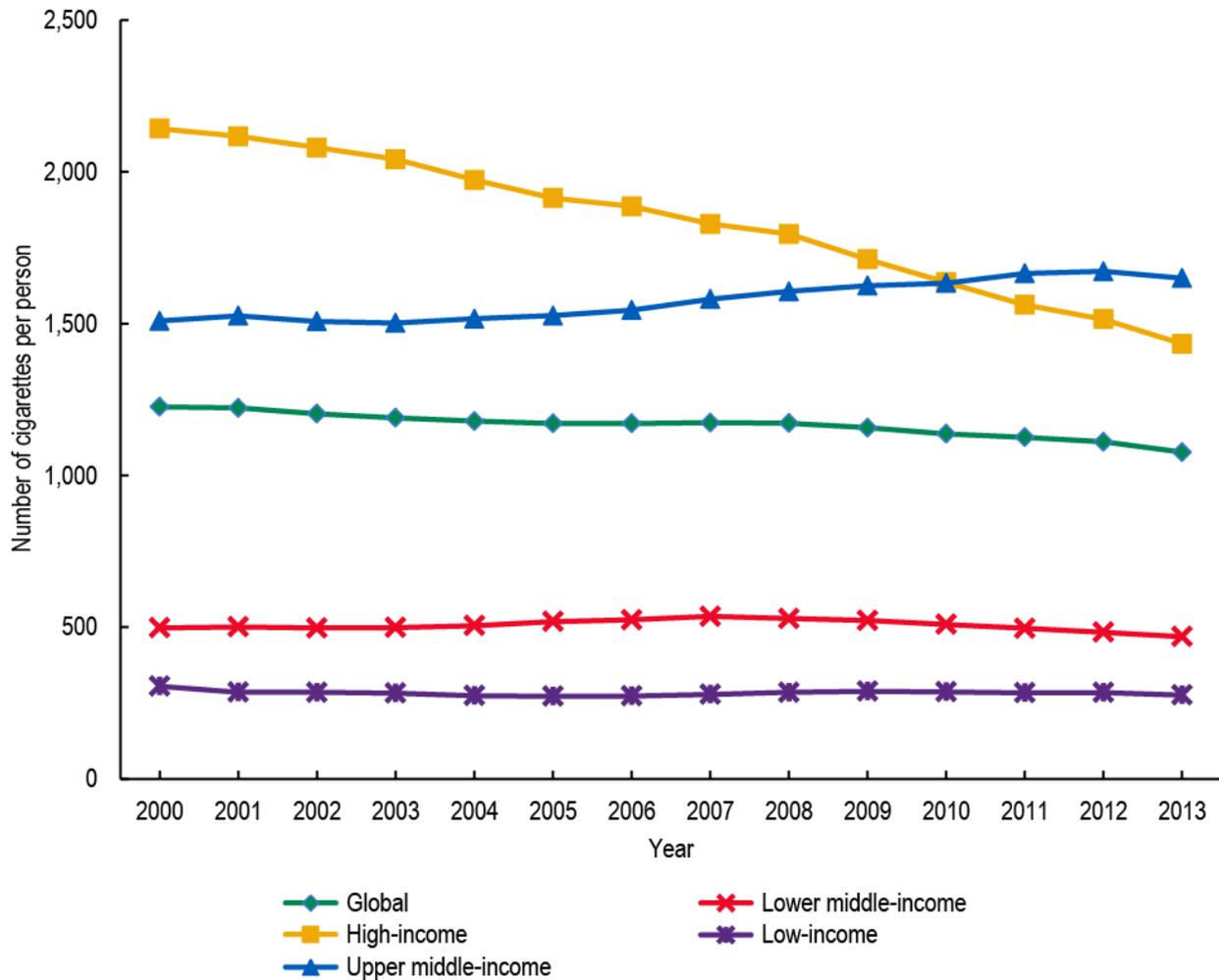
**Figure 2.11 Global Per Capita Cigarette Consumption Among People Age 15 Years and Older, by WHO Region, 2000–2013**



Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions.  
 Source: Based on data from Euromonitor International 2016.<sup>12</sup> For more information, see the Statistical Annex.

As shown in Table 2.9 and Figure 2.12, data for World Bank country income groups show a similar picture. HICs experienced a substantial reduction, from 2,142 cigarettes per person in 2000 to 1,433 in 2013. Per capita consumption in lower middle-income countries remained essentially unchanged between the year 2000 and the years 2010–2013, despite an increase in the mid-2000s. Upper middle-income countries, however, generally experienced increases between 2000 (1,509 cigarettes per person), 2012 (1,672), and 2013 (1,650).<sup>12</sup>

**Figure 2.12 Per Capita Cigarette Consumption Among People Age 15 Years and Older, Globally and by Country Income Group, 2000–2013**



Note: Country income group classification based on World Bank Analytical Classifications for 2013.

Source: Based on data from Euromonitor International 2016.<sup>12</sup> For more information, see the Statistical Annex.

## Smokeless Tobacco Products

### Prevalence of Smokeless Tobacco Use Among Adults

WHO estimates that there are at least 346 million adult ST users worldwide. As shown in Table 2.10, the South-East Asia Region has by far the largest number of adult ST users, with 296.9 million users (86% of the total number of ST users worldwide). India has the largest number of ST users of any country (152.4 million men and 80.8 million women users),<sup>18</sup> followed by Bangladesh (16.5 million men and 18.7 million women users).<sup>19</sup> (Note that, as described in the Statistical Annex, many countries lack adequate surveillance data for ST. Additionally, the NCI–CDC report *Smokeless Tobacco and Public Health: A Global Perspective*<sup>8</sup> also concluded that in many regions, including some where ST use is highly prevalent, surveillance of ST use is inadequate.)

There is concern that the introduction of new ST products and their marketing to new users may lead to increased tobacco use in countries or populations where it had previously been low. In some HICs, cigarette manufacturers have introduced ST products with attractive flavorings, such as mint or fruit flavors, and new nicotine delivery methods, such as lozenges or small pouches that allow for more concealed use. For example, sales of moist snuff products (including snus) in the United States increased 65.6% between 2005 and 2011.<sup>20</sup>

**Table 2.10 Prevalence of Adult Current Smokeless Tobacco Use, by WHO Region and Country Income Group, 2010**

WHO Region	Estimated prevalence (%)			Number of ST users (in millions)		
	Men	Women	Both sexes	Men	Women	Both sexes
<b>Global</b>	<b>8.4</b>	<b>4.6</b>	<b>6.5</b>	<b>223.3</b>	<b>122.7</b>	<b>346.0</b>
African	2.8	2.1	2.4	7.6	5.9	13.4
Americas	0.6	0.2	0.4	1.3	0.5	1.8
Eastern Mediterranean	4.1	1.4	2.9	9.0	2.8	11.8
European	2.1	0.1	1.0	3.4	0.2	3.6
South-East Asia	27.4	16.5	22.0	187.3	109.6	296.9
Western Pacific	1.0	0.4	0.7	6.5	2.8	9.2
High-income OECD	1.9	0.2	1.2	8.2	1.0	9.2

World Bank country income group	Estimated prevalence (%)			Number of ST users (in millions)		
	Men	Women	Both sexes	Men	Women	Both sexes
<b>Global</b>	<b>8.4</b>	<b>4.6</b>	<b>6.5</b>	<b>223.3</b>	<b>122.7</b>	<b>346.0</b>
High-income	1.7	0.2	1.1	8.9	1.2	10.1
Upper middle-income	1.0	0.5	0.7	9.4	4.5	13.8
Lower middle-income	19.0	10.2	14.6	171.7	90.7	262.3
Low-income	12.7	9.8	11.2	33.3	26.4	59.7

Notes: WHO = World Health Organization. ST = smokeless tobacco. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. Country income group classification based on World Bank Analytical Classifications for 2014.

Source: Based on data from World Health Organization 2015.<sup>1</sup> For more information, see the Statistical Annex.

### Prevalence of Smokeless Tobacco Use Among Youth

Using data from the Global Youth Tobacco Surveys, WHO has estimated that at least 12.8 million youth ages 13–15 globally used ST in 2010, a prevalence of 3.6% (Table 2.11). This compares with a prevalence rate of 7.0% for youth cigarette smoking (24.8 million youth). The number of boys using ST was 8.6 million compared with 4.2 million girls, for a ratio of 2 boy users for every girl user. These prevalence rates and absolute numbers of users were derived by applying prevalence data for surveys carried out between 2007 and 2014 to the 2010 regional and global 13- to 15-year-old populations (as estimated by the UN Population Division).<sup>5</sup>

**Table 2.11 Prevalence of Smokeless Tobacco Use Among Youth Ages 13–15 Years, by WHO Region and Country Income Group, 2007–2014**

WHO Region	Estimated prevalence (%)			Number of ST users (in thousands)		
	Boys	Girls	Both sexes	Boys	Girls	Both sexes
<b>Global</b>	<b>4.7</b>	<b>2.5</b>	<b>3.6</b>	<b>8,588</b>	<b>4,242</b>	<b>12,831</b>
African	2.2	1.5	1.8	652	432	1,084
Americas	2.4	1.6	2.0	390	255	645
Eastern Mediterranean	4.7	3.2	3.9	874	568	1,442
European	1.3	1.1	1.2	114	91	205
South-East Asia	9.7	4.9	7.4	5,222	2,458	7,680
Western Pacific	1.8	0.9	1.4	659	309	968
High-income OECD	3.6	0.7	2.2	677	130	807

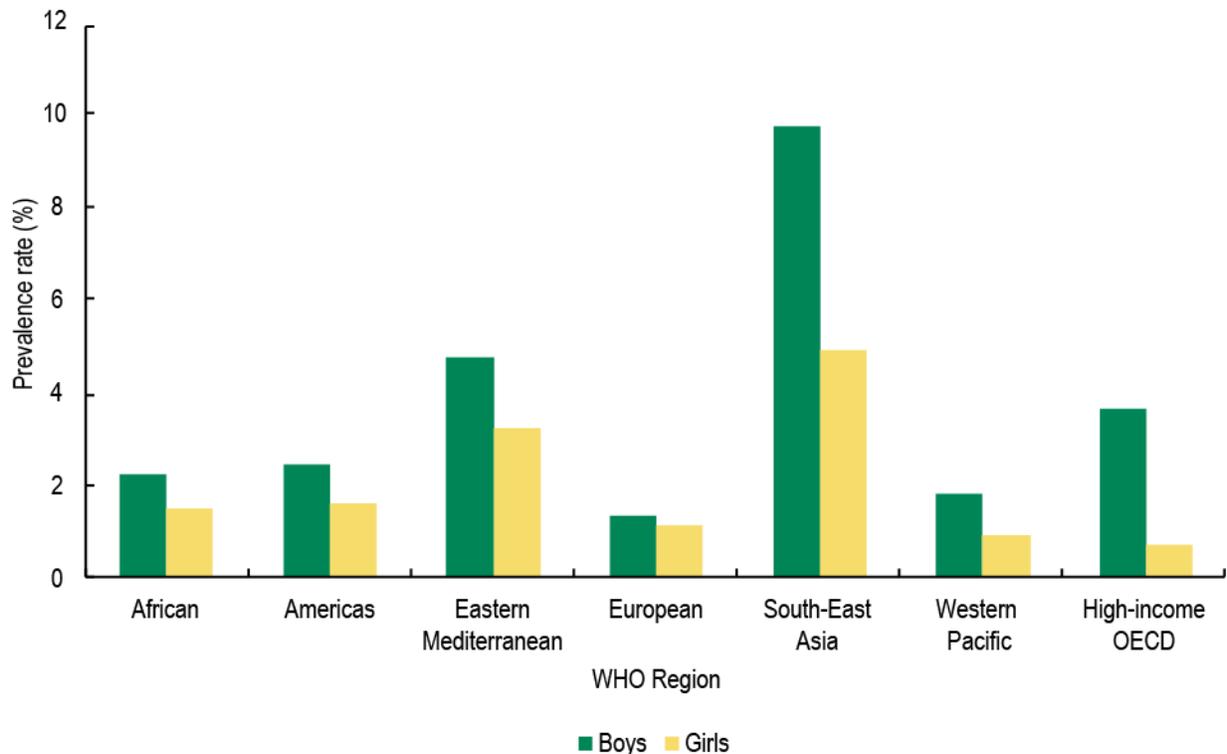
World Bank country income group	Estimated prevalence (%)			Number of ST users (in thousands)		
	Boys	Girls	Both sexes	Boys	Girls	Both sexes
<b>Global</b>	<b>4.7</b>	<b>2.5</b>	<b>3.6</b>	<b>8,588</b>	<b>4,242</b>	<b>12,831</b>
High-income	3.6	0.8	2.2	742	161	903
Upper middle-income	2.0	1.2	1.6	1,165	647	1,812
Lower middle-income	7.2	3.8	5.6	6,070	3,004	9,074
Low-income	3.1	2.2	2.6	612	430	1,043

Notes: WHO = World Health Organization. ST = smokeless tobacco. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. Country income group classification based on World Bank Analytical Classifications for 2010. The number of users was calculated by applying the prevalence rates to the United Nations–provided population estimates for the year 2010.

Source: Based on data from Global Youth Tobacco Survey 2007–2014.<sup>5</sup> For more information, see the Statistical Annex.

Youth in the South-East Asia Region had the highest prevalence of ST use in 2010 (7.4%), as well as the highest ST prevalence among both boys (9.7%) and girls (4.9%) (Table 2.11 and Figure 2.13). Youth ST users in the South-East Asia Region accounted for 60% of all ST users ages 13–15 years in the world.<sup>5</sup>

**Figure 2.13** Prevalence of Smokeless Tobacco Use Among Youth Ages 13–15 Years, by WHO Region, 2007–2014

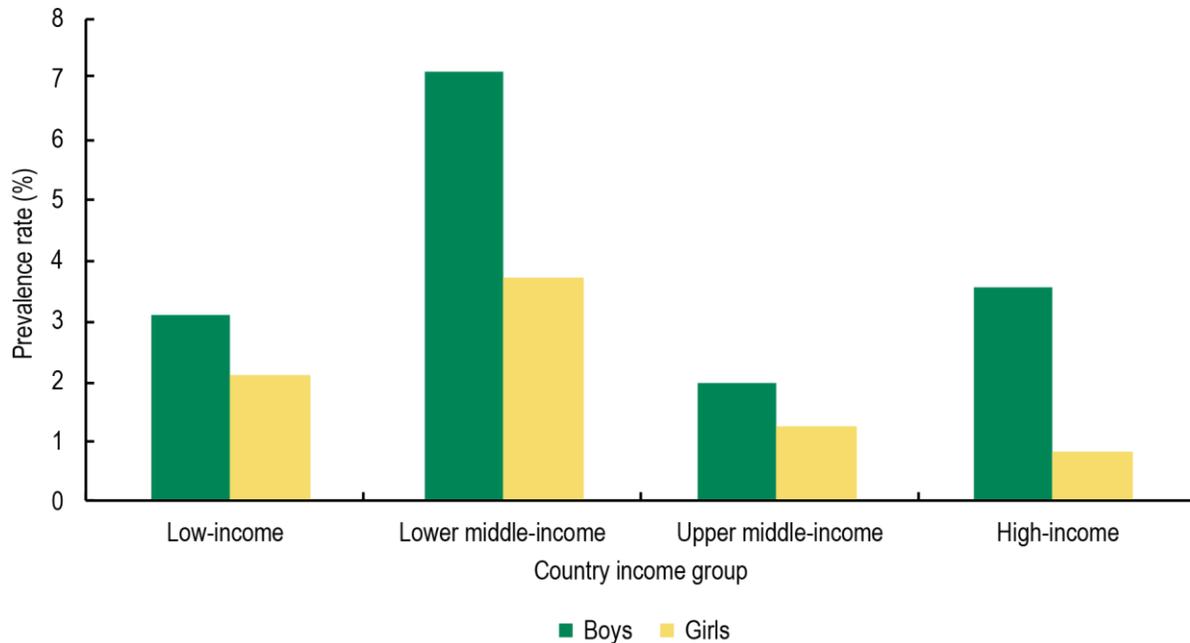


Notes: WHO = World Health Organization. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. The number of users was calculated by applying the prevalence rates to the United Nations–provided population estimates for 2010.

Source: Based on data from Global Youth Tobacco Survey 2007–2014.<sup>5</sup> For more information, see the Statistical Annex.

The prevalence of ST use is greater in low-income and lower middle-income countries than in high-income and upper middle-income countries, particularly among youth (Table 2.11 and Figure 2.14). In contrast, the prevalence of cigarette smoking is greater in high-income and upper middle-income countries than in lower middle-income and low-income countries (Table 2.1 and Figure 2.1).

**Figure 2.14** Prevalence of Smokeless Tobacco Use Among Youth Ages 13–15 Years, by Country Income Group, 2007–2014



Notes: Country income group classification based on World Bank Analytical Classifications for 2014. The number of users was calculated by applying the prevalence rates to the United Nations–provided population estimates for 2010.

Source: Based on data from Global Youth Tobacco Survey 2007–2014.<sup>5</sup> For more information, see the Statistical Annex.

## Other Tobacco Products

As new products and marketing strategies emerge and globalization, population migration, and tobacco control policies alter the environment, studying patterns of tobacco consumption becomes more challenging. Some tobacco control experts warn that the increased marketing of other tobacco products, such as snus or modified cigarettes, could have an adverse health impact by appealing to young people or new users, or by assisting smokers to maintain their nicotine dependence.<sup>21–23</sup>

In the past decade, ENDS, often marketed as an alternative to conventional cigarettes, have been increasingly promoted and used worldwide. Prevalence of having ever used ENDS was 12.6% among U.S. adults in 2014,<sup>24</sup> and ENDS use rose from 7% to 12% among European Union residents age 15 years and over between 2012 and 2014.<sup>25</sup>

ENDS pose new research and regulatory challenges, as the safety of these products and their efficacy for smoking cessation remain unclear.<sup>26–28</sup> Some countries have banned the sale and marketing of these products (e.g., Panama,<sup>29,30</sup> Singapore,<sup>31</sup> Thailand,<sup>32</sup> and Uruguay<sup>33</sup>). The European Union enacted a revised Tobacco Products Directive that includes regulation of ENDS products, and several U.S. states and localities have enacted smoke-free policies and/or laws restricting minors' access to these products.<sup>28,34,35</sup> In November 2015, the United Kingdom's Medicines and Healthcare Products Regulatory Agency licensed a British American Tobacco ENDS called 'e-Voke' for medical use as a smoking cessation device.<sup>36</sup>

Globalization and population migration are also contributing to a changing tobacco landscape, leading to the emergence of non-traditional products within regions and among populations where their use had previously not been a concern. Examples include use of ST and waterpipes. South Asian emigrants have brought to their new countries products that are commonly used in their countries of origin (e.g., smokeless tobacco). ST products are also marketed to the large Asian immigrant labor force in the Eastern Mediterranean Region.<sup>8</sup> Changing social norms and the denormalization of cigarette smoking might contribute to the increased attractiveness of smokeless products in places where smoking is declining. Traditionally used among men in the Middle East and North Africa, waterpipe smoking is increasing in many countries where it was previously unknown.<sup>37–40</sup> The introduction of products to new markets may influence patterns of tobacco use in those countries and, in turn, impact public health.

### Exposure to Secondhand Smoke

Secondhand smoke (sometimes referred to as passive smoking, environmental tobacco smoke, or tobacco smoke pollution) is a mixture of sidestream smoke from the burning tip of cigarettes or other smoked tobacco products, and mainstream smoke exhaled by the smoker. At least 50 carcinogenic chemicals have been identified in SHS,<sup>41</sup> and scientific evidence indicates that there is no safe level of exposure to SHS.<sup>42</sup> People in low-income countries and of lower educational attainment are less likely to be aware of the risks of SHS exposure or to take precautions to protect children and other nonsmokers in the family.<sup>41,43</sup>

Cross-sectional data collected in 2006 from households in 31 countries (12 countries in Asia, 9 in the Americas, 3 in the Middle East, and 7 in Europe [not including Western Europe and the United States]) showed that air nicotine concentrations were 17 times higher in households with a smoker than in those without a smoker, and 12.9 times higher in households that permitted smoking indoors than in those that prohibited it.<sup>44</sup> This study also showed that hair nicotine concentrations collected from women and children in 1,200 of these households increased with the number of smokers in the household.<sup>44</sup>

As described further in chapter 6, comprehensive smoke-free policies—those that, by law, completely prevent smoking in all enclosed indoor workplaces, public places, and transportation—are now in place in many countries. Article 8 of the WHO FCTC obligates Parties to the treaty to adopt and implement effective measures to protect people from exposure to SHS in indoor workplaces, public transport, indoor public places, and, as appropriate, other public places. However, exposure to SHS in the workplace, in public places, and in the home remains common.

Data on exposure to SHS in the 26 countries that have completed a Global Adult Tobacco Survey as well as in the United States (Table 2.12) show a very broad range of SHS exposure levels at work (from 5.6% to 69.1%) and at home (from 4.4% to 78.4%). In all 27 countries, men were more likely than women to be exposed to SHS at work. Exposure at home was often similar between men and women; in general, women's greatest exposure occurred at home rather than at work.

**Table 2.12 Adult Exposure to Secondhand Smoke at Work and at Home in Selected Countries, 2008–2014**

Country	At work				At home			
	Male (%)	Female (%)	Both sexes (%)	Male–female ratio	Male (%)	Female (%)	Both sexes (%)	Male–female ratio
Argentina	38.5	24.1	31.6	1.6	34.1	31.9	33.0	1.1
Bangladesh	67.8	30.4	63.0	2.2	—	—	—	—
Brazil	28.5	20.4	24.4	1.4	28.9	27.0	27.9	1.1
China	71.1	53.2	63.3	1.3	70.5	63.9	67.3	1.1
Egypt	62.4	54.0	60.7	1.2	68.1	73.6	70.8	0.9
Greece	58.8	41.8	52.3	1.4	68.9	62.5	65.7	1.1
India	32.2	19.4	29.9	1.7	52.2	52.5	52.3	1.0
Indonesia	58.0	41.4	51.3	1.4	81.4	75.4	78.4	1.1
Kazakhstan	24.7	12.9	19.0	1.9	16.7	11.4	13.8	1.5
Kenya	23.0	11.5	17.6	2.0	16.8	12.0	14.3	1.4
Malaysia	46.2	30.1	39.8	1.5	43.3	33.3	38.4	1.3
Mexico	23.3	13.9	19.7	1.7	17.4	18.2	17.8	1.0
Nigeria	21.1	12.0	17.3	1.8	7.7	5.6	6.6	1.4
Pakistan	72.5	37.3	69.1	1.9	50.8	45.7	48.3	1.1
Panama	7.4	3.7	5.6	2.0	5.3	3.5	4.4	1.5
Philippines	43.3	28.8	36.9	1.5	50.9	46.7	48.8	1.1
Poland	41.3	24.9	33.6	1.7	44.9	43.6	44.2	1.0
Qatar	13.7	7.8	12.0	1.8	16.7	17.0	16.8	1.0
Romania	36.8	31.2	34.2	1.2	37.7	33.2	35.4	1.1
Russian Federation	45.7	25.7	34.9	1.8	36.7	33.0	34.7	1.1
Senegal	33.0	25.1	30.4	1.3	24.5	19.0	21.6	1.3
Thailand	39.9	32.3	36.0	1.2	37.1	22.8	30.5	1.6
Turkey	17.8	9.6	15.6	1.9	39.2	37.4	38.3	1.0
Ukraine	44.0	22.9	34.0	1.9	33.6	28.1	30.6	1.2
United States*	27.6	20.1	24.0	1.4	4.7	4.1	4.4	1.1
Uruguay	21.4	11.8	16.5	1.8	32.0	26.7	29.2	1.2
Viet Nam	68.7	41.4	55.9	1.7	77.2	69.2	73.1	1.1

\*Data presented for the United States is based on the National Adult Tobacco Survey.

Sources: Global Adult Tobacco Survey 2008–2014.<sup>15</sup> National Adult Tobacco Survey 2013–2014.<sup>4</sup>

According to a similar analysis using data from the Global Youth Tobacco Surveys (Tables 2.13 and 2.14), a substantial proportion of youth ages 13 to 15 years reported being exposed to SHS, both inside and outside the home. As many as 116 million youth in this age group reported SHS exposure at home, and 173 million reported exposure outside the home. The actual number of youth exposed is likely to be substantially higher, as most of these 13- to 15-year-olds would have siblings who also would have been exposed.

**Table 2.13 Percentage of Youth Ages 13–15 Years Exposed to Secondhand Smoke Inside the Home, by WHO Region and Country Income Group, 2007–2014**

WHO Region	Estimated prevalence (%)			No. exposed to SHS (in thousands)		
	Boys	Girls	Both sexes	Boys	Girls	Both sexes
<b>Global</b>	<b>33.9</b>	<b>31.3</b>	<b>32.6</b>	<b>62,068</b>	<b>53,817</b>	<b>115,885</b>
African	28.8	27.3	28.1	8,606	8,005	16,611
Americas	28.3	27.1	27.7	4,676	4,331	9,007
Eastern Mediterranean	28.5	26.1	27.3	5,336	4,652	9,989
European	51.9	56.2	54.0	4,451	4,612	9,063
South-East Asia	31.0	25.4	28.3	16,728	12,664	29,392
Western Pacific	46.8	43.6	45.3	17,128	14,266	31,394
High-income OECD	27.1	29.4	28.2	62,068	53,817	115,885

World Bank country income group	Estimated prevalence (%)			No. exposed to SHS (in thousands)		
	Boys	Girls	Both sexes	Boys	Girls	Both sexes
<b>Global</b>	<b>33.9</b>	<b>31.3</b>	<b>32.6</b>	<b>62,068</b>	<b>53,817</b>	<b>115,885</b>
High-income	36.5	39.0	37.7	5,712	5,836	11,548
Upper middle-income	41.0	38.2	39.6	24,214	21,085	45,298
Lower middle-income	30.8	26.7	28.8	26,194	21,525	47,719
Low-income	32.1	27.7	29.9	5,949	5,372	11,320

Notes: WHO = World Health Organization. SHS = secondhand smoke. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. The number of youth exposed was calculated by applying the prevalence rates to the United Nations–provided population estimates for 2010. Country income group classification based on World Bank Analytical Classifications for 2014.

Source: Based on data from Global Youth Tobacco Survey 2004–2014.<sup>5</sup> For more information, see the Statistical Annex.

**Table 2.14 Percentage of Youth Ages 13–15 Years Exposed to Secondhand Smoke Outside the Home, by WHO Region and Country Income Group, 2007–2014**

WHO Region	Estimated prevalence (%)			No. exposed to SHS (in thousands)		
	Boys	Girls	Both sexes	Boys	Girls	Both sexes
<b>Global</b>	<b>50.0</b>	<b>47.7</b>	<b>48.9</b>	<b>91,650</b>	<b>82,010</b>	<b>173,660</b>
African	52.6	49.6	51.1	15,691	14,530	30,221
Americas	45.8	40.8	43.3	7,564	6,514	14,078
Eastern Mediterranean	43.5	37.0	40.3	8,149	6,609	14,758
European	75.4	75.1	75.3	6,462	6,161	12,623
South-East Asia	40.1	34.4	37.4	21,649	17,167	38,815
Western Pacific	62.8	62.2	62.5	23,017	20,354	43,371
High-income OECD	48.0	59.3	53.5	9,117	10,676	19,793

World Bank country income group	Estimated prevalence (%)			No. exposed to SHS (in thousands)		
	Boys	Girls	Both sexes	Boys	Girls	Both sexes
<b>Global</b>	<b>50.0</b>	<b>47.7</b>	<b>48.9</b>	<b>91,650</b>	<b>82,010</b>	<b>173,660</b>
High-income	56.8	63.7	60.1	9,963	11,374	21,337
Upper middle-income	51.2	47.6	49.4	34,277	30,370	64,647
Lower middle-income	42.9	38.2	40.6	37,091	30,922	68,013
Low-income	57.3	51.3	54.3	10,319	9,343	19,662

Notes: WHO = World Health Organization. SHS = secondhand smoke. High-income OECD countries = countries defined as high-income by the Organisation for Economic Co-operation and Development. High-income OECD countries are excluded from their respective regions. The number of youth exposed was calculated by applying the prevalence rates to the United Nations–provided population estimates for 2010. Country income group classification based on World Bank Analytical Classifications for 2014.

Source: Based on data from Global Youth Tobacco Survey 2004–2014.<sup>5</sup> For more information, see the Statistical Annex.

## Tobacco-Related Health Disparities

WHO has called attention to the “vicious cycle of tobacco and poverty” and recognizes that the death, disease, loss of income, and loss of productivity due to tobacco all contribute to poverty, along with the diversion of household funds from necessary resources, such as food, shelter, and education, to tobacco purchases.<sup>45,46</sup> (See chapter 16 for additional information.)

National surveillance data from the United States, Australia, and other HICs have documented an increasingly disproportionate burden of tobacco use and exposure to SHS, and as a consequence, a higher level of tobacco-related ill health and death among lower socioeconomic groups within these countries. In the United States, although tobacco smoking prevalence has declined across all income categories, smoking has declined less among people living below the poverty line. Socioeconomic position has been typically defined by family/household income or poverty status, educational attainment, and occupational category (e.g., working class or blue-collar occupations versus professional or white-collar occupations).<sup>47–53</sup> Tobacco-related health disparities (TRHDs) have also been documented across other factors, such as gender, ethnicity, neighborhood poverty level, and geographical region.<sup>48,49,54,55</sup>

Similarly, the Australian Institute of Health and Welfare<sup>56</sup> has reported that people of the lowest socioeconomic status (SES), whether measured by income or by completed level of education, were almost three times more likely to smoke daily compared with people of the highest SES (19.9% versus 6.7%, respectively). Similar trends are seen in European countries, where overall tobacco smoking prevalence is gradually yet steadily declining while becoming more concentrated among lower SES populations than among their more prosperous counterparts.<sup>57,58</sup>

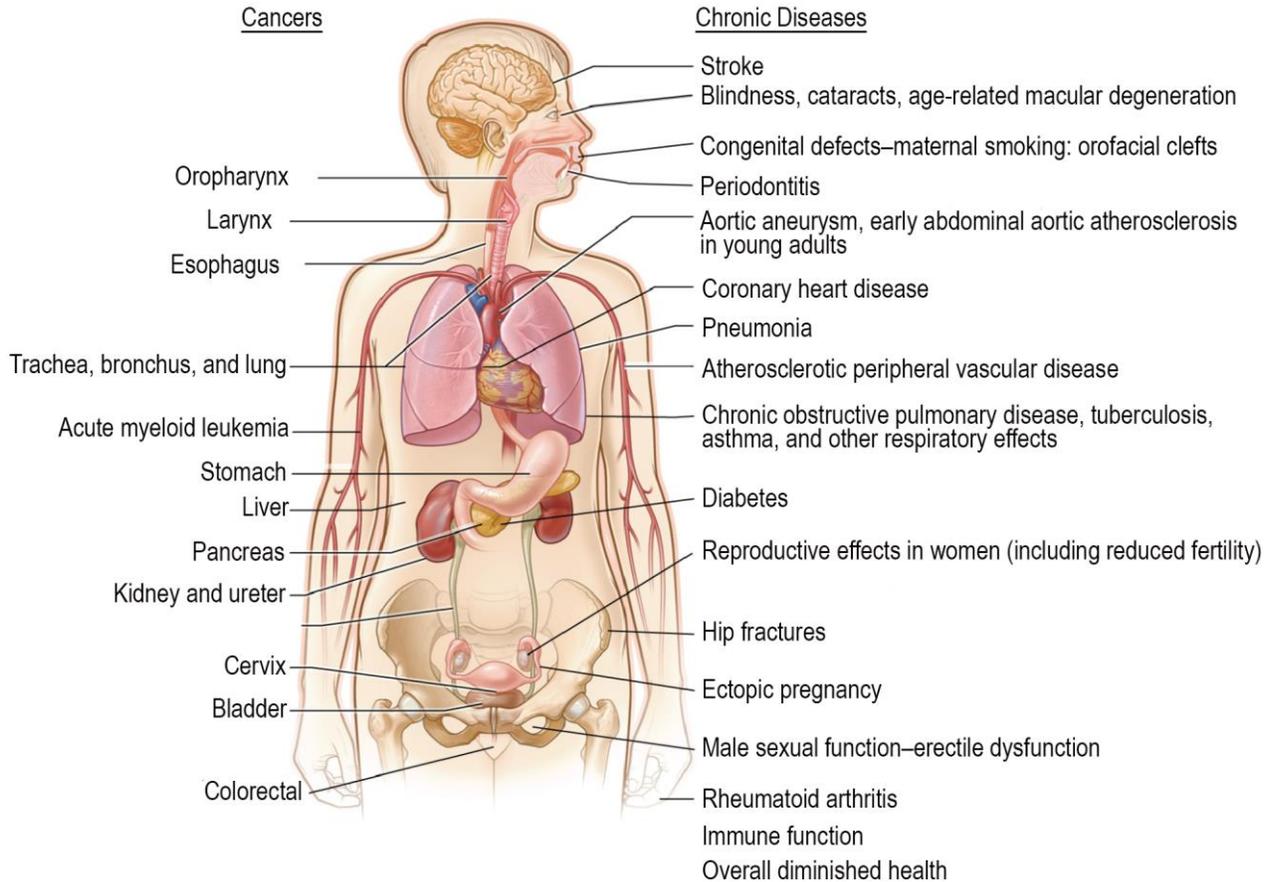
Until relatively recently, most of the evidence on TRHDs across the globe has come from studies conducted in HICs. Evidence of a disproportionate burden of tobacco use among the poor and other less-resourced populations has become increasingly available.<sup>50,59</sup> WHO World Health Survey data for 48 LMICs in all WHO Regions were analyzed to examine socioeconomic inequality in smoking among men and women age 18 years and older.<sup>60</sup> These data showed that smoking was more prevalent among poor men in most countries, and that the poorest men were more than 2.5 times more likely to smoke than the richest men in many countries. Socioeconomic inequality in women was more varied, showing higher prevalences of tobacco smoking among the rich in some countries and among the poor in other countries. In 20 countries, the poorest women had a statistically significant higher prevalence of smoking compared with the richest women. In contrast, in 9 mostly middle-income Eastern European countries, the richest women were more likely to smoke than the poorest women.

## Health Consequences of Tobacco Use

### Tobacco Use, Secondhand Smoke Exposure, and Disease

Decades of research have conclusively established that tobacco use, and in particular cigarette smoking, causes numerous serious illnesses, including cancer, cardiovascular disease and stroke, and pulmonary disease. As shown in Figure 2.15, major diseases causally linked to cigarette smoking include diseases of the circulatory system (e.g., ischemic heart and cerebrovascular diseases); cancers of the trachea, bronchus and lung, esophagus, oropharynx, larynx, stomach, liver, pancreas, kidney and ureter, cervix, bladder, colon/rectum, as well as acute myeloid leukemia; chronic respiratory diseases (e.g., asthma, chronic obstructive pulmonary disease); and metabolic diseases such as diabetes mellitus.<sup>61</sup> The U.S. Surgeon General has stated that “cigarette smoking has been causally linked to diseases of nearly all organs of the body, to diminished health status, and to harm to the fetus. Even 50 years after the first Surgeon General’s report, research continues to newly identify diseases caused by smoking.”<sup>61,p.7</sup> Such common diseases as diabetes mellitus, rheumatoid arthritis, and colorectal cancer were causally linked to smoking by this more recent research.

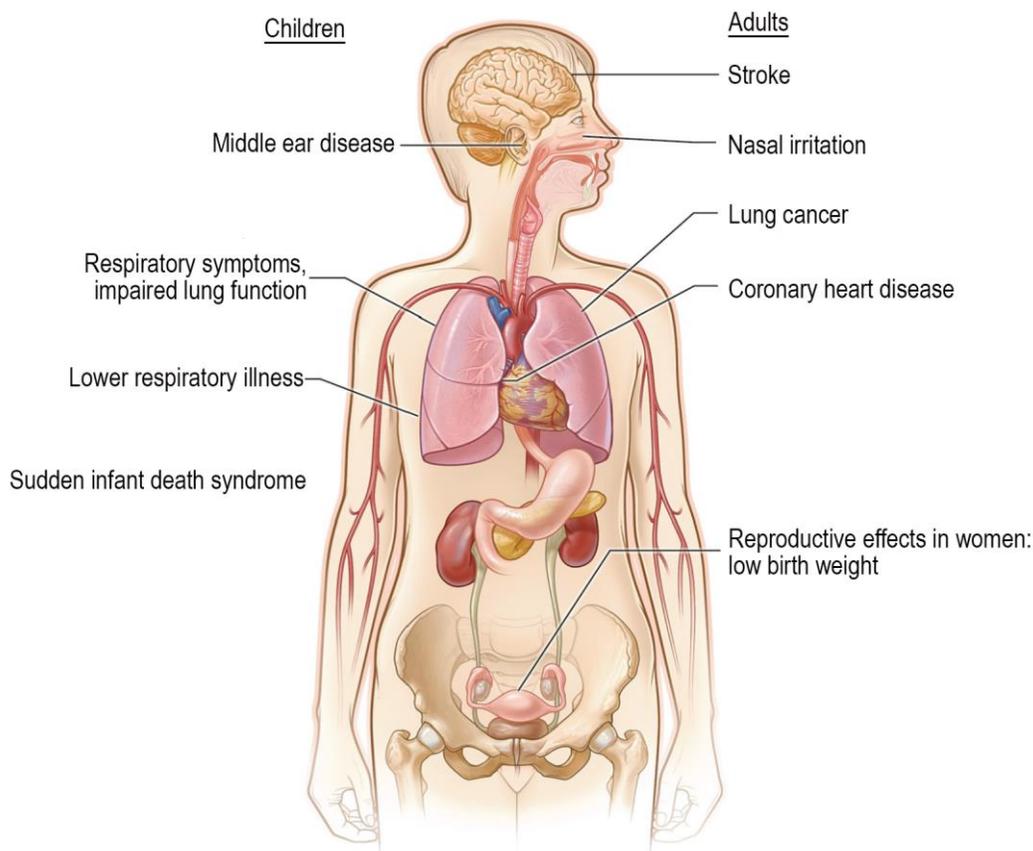
**Figure 2.15 Health Consequences Causally Linked to Smoking**



Source: Centers for Disease Control and Prevention 2014.<sup>61</sup>

The health hazards of exposure to SHS are also now well established. These include cancer, respiratory and cardiovascular diseases in adults, as well as disease and death in infants and children (Figure 2.16). The International Agency for Research on Cancer (IARC) has concluded that SHS is carcinogenic to humans (Group 1).<sup>62</sup>

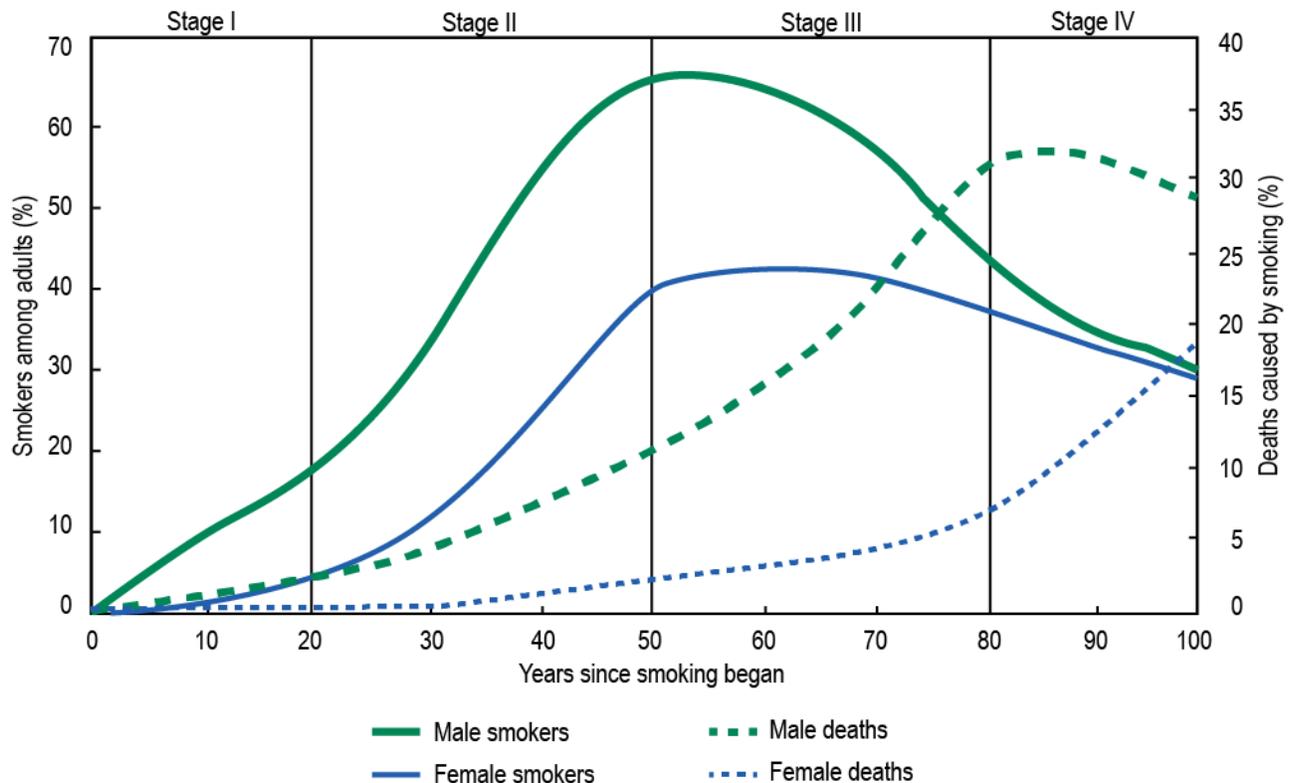
Both tobacco use and SHS exposure during pregnancy have been conclusively linked to harm to the developing fetus. Active cigarette smoking by the mother increases the risk for ectopic pregnancy, premature rupture of membranes, abruptio placentae, placenta previa, miscarriage, stillbirth, preterm birth, low birth weight, small for gestational age, some congenital anomalies, and sudden infant death syndrome (SIDS). Women who are exposed to SHS while pregnant are also at increased risk for having babies with low birth weight.<sup>63,64</sup>

**Figure 2.16 Health Consequences Causally Linked to Secondhand Smoke Exposure**

Source: Centers for Disease Control and Prevention 2014.<sup>61</sup>

### Stages of the Tobacco Epidemic and Global Implications

To understand the evolution of the tobacco epidemic in all countries, regardless of income level, and the potential impact of tobacco use on morbidity and mortality over time, Lopez and colleagues<sup>65</sup> proposed a descriptive model of smoking prevalence and mortality in 1994. This model was based on a careful analysis of changes in tobacco use over time and of mortality attributable to tobacco in the United States and selected HICs. When Lopez and colleagues first proposed this model, many LMICs had been exposed to tobacco use for only a short time compared with HICs. Many LMICs have now been subjected to tobacco industry marketing and distribution processes for at least 30 years—long enough for the health consequences of tobacco use to become apparent (Figure 2.17). Countries with the longest history of tobacco use and relatively strong tobacco control measures are generally thought to be in Stage IV of the model; countries with shorter histories of exposure to tobacco are expected to transition from Stage I to Stage IV. The model indicates that countries in the early stages of the epidemic could take several decades to see a decrease in tobacco-related mortality. Implementation of strong tobacco control measures can hasten progression through the stages, possibly leading to lower prevalence and improved health outcomes sooner. Indeed, strong tobacco control measures may help ensure that countries in the early stages of the epidemic never progress to the later stages at all.

**Figure 2.17 Four-Stage Model of the Cigarette Epidemic**


Source: Lopez et al. 1994.<sup>65</sup>

Reproduced from "A descriptive model of the cigarette epidemic in developed countries," Lopez A, Collishaw N, Pihl T, volume 3(3), p. 246, with permission from BMJ Publishing Group Ltd.

In 2012, Thun and colleagues<sup>66</sup> updated the model to describe the stages of the epidemic separately for men and women so as to increase the model's utility for countries (primarily low-income and low- and middle-income countries) where women's tobacco use rates remain low.

### Impact of Tobacco on Noncommunicable Diseases

According to the *WHO Global Report: Mortality Attributable to Tobacco*,<sup>9</sup> worldwide, 12% of all adult deaths (>30 years of age and older) are attributed to tobacco (16% among men, 7% among women). Deaths from noncommunicable diseases (NCDs) currently account for nearly 70% of all deaths globally.<sup>67</sup> Tobacco is widely acknowledged to be one of the major risk factors for NCD deaths; indeed, worldwide, approximately 14% of adult deaths from NCDs are attributed to tobacco use, including 10% of all adult deaths from cardiovascular diseases (14% among men; 6% among women), and 22% of all adult deaths from cancer (32% among men, 11% among women). The vast majority (71%) of adult lung cancer deaths (78% among men, 53% among women) were attributable to tobacco. In addition, 36% of all adult deaths from diseases of the respiratory system were attributable to tobacco (42% among men, 29% among women). Tobacco smoking is also an important causal factor for chronic obstructive pulmonary disease (COPD) and is responsible for more than 75% of cases worldwide.<sup>68</sup> In 2004 about 49% of COPD deaths among adult men and 34% of COPD deaths among adult women were attributable to tobacco.<sup>9</sup>

### **Impact of Tobacco on Communicable Diseases**

Approximately 5% of global deaths from communicable diseases are attributed to tobacco, including 7% of all deaths due to tuberculosis (TB) and 12% of deaths due to lower respiratory infections.<sup>9</sup> The vast majority of tobacco-related TB deaths occur in LMICs.<sup>69</sup> A systematic review by WHO<sup>70</sup> found a significant positive relationship between exposure (passive or active) to tobacco smoke and TB infection and disease, independent of various potential confounders including alcohol use and socioeconomic status. Recurrent TB and mortality resulting from TB were also associated with active smoking.<sup>70</sup> Recent research suggests that cigarette smoking doubles the risk of recurrent TB in those previously treated, complicating disease control efforts.<sup>71</sup> Data from India show that tobacco smoking increases the risk of dying from TB by two to four times, and accounts for about half of TB deaths in men.<sup>72–74</sup>

### **Impact of Tobacco Mortality, by Region**

Data reported by WHO showed that, in 2004, the number of deaths attributable to tobacco was greatest in the European Region (1.47 million deaths), followed by the Western Pacific Region (1.41 million deaths), the South-East Asia Region (1.04 million deaths), and the Americas Region (0.86 million deaths). In addition, tobacco use caused 0.15 million deaths in the African Region and 0.19 million deaths in the Eastern Mediterranean Region.<sup>75</sup> According to these data, nearly 70% of deaths attributable to tobacco worldwide occurred in LMICs.<sup>75</sup> Death rates for diseases caused by smoking were lower in low-income countries than in middle-income countries and HICs, reflecting the lower past smoking rates in low-income countries and the higher past smoking rates in middle-income countries and HICs.

Tobacco use was a leading health risk in HICs, causing 1.5 million deaths, or 17.9% of total mortality, in those countries. In middle-income countries, 2.6 million deaths, or 10.8% of deaths, were attributable to tobacco use. In low-income countries, tobacco use caused 1 million deaths, or 3.9% of deaths.<sup>75</sup> Because of the lengthy time lags for the development of cancers and chronic respiratory diseases associated with tobacco smoking, deaths from these illnesses in LMICs—and among women in many regions—may continue to rise, even if smoking prevalence remains the same or decreases.

### **Disease Burden Attributable to Secondhand Smoke Exposure**

Based on analyses of 2004 data, SHS exposure was estimated to have caused more than 600,000 deaths worldwide (accounting for 1% of global mortality), including 379,000 deaths from ischemic heart disease, 166,000 from lower respiratory infections, 35,800 from asthma, and 21,400 from lung cancer.<sup>76</sup> Twenty-eight percent of deaths from SHS exposure occurred in children. Of adult deaths attributable to SHS exposure, about 47% occurred in women. In addition, global data showed that 10.9 million disability-adjusted life-years (DALYs) were lost in 2004 because of SHS exposure, which accounted for about 0.7% of the total worldwide burden of diseases in DALYs. Children bear 61% of the burden in DALYs. The largest disease burdens were from lower respiratory infections in children younger than 5 years old (5.9 million), ischemic heart disease in adults (2.8 million), and asthma in adults (1.2 million) and children (0.7 million).<sup>2</sup> In the United States, nonsmokers' SHS exposure has been shown to increase the risk of developing coronary heart disease; to increase the risk of suffering a stroke (by 20%–30% for those exposed to SHS); to increase the risk of diabetes by 30%–40%; and to increase the risk of developing cancers, notably lung cancer, by about 25%.<sup>61</sup>

## Summary

Around the world, the health burden of tobacco use is enormous. At present, about 6 million people die each year from tobacco use; this figure is projected to grow to 8 million by 2030, with the vast majority (80%) of deaths anticipated to occur in low- and middle-income countries. A wide variety of tobacco products—both smoked products (cigarettes, cigars, kreteks, bidis, and waterpipe) and a diverse group of smokeless tobacco products—are in use worldwide. Manufactured cigarettes, however, account for 92.3% of tobacco sales worldwide; thus they are responsible for by far the most of tobacco-caused disease and death. Secondhand smoke, a mixture of sidestream smoke from the burning tip of cigarettes or other smoked tobacco products and mainstream smoke exhaled by the smoker, is a cause of disease and death in adults and children. Tobacco use and secondhand smoke exposure are now recognized as important causes of noncommunicable disease, communicable disease, and harm during pregnancy. Tobacco use is estimated to cause 12% of deaths among persons aged 30 and over worldwide; this represents about 14% of deaths from noncommunicable diseases (such as cancer, cardiovascular disease, and lung disease) and 5% of deaths from communicable diseases (such as tuberculosis and lower respiratory tract infections). Additionally, tobacco use contributes to and exacerbates poverty, which itself contributes to ill health.

About 21% of the world's population age 15 and over (about 1.1 billion people) are current smokers—about 35% of males and 6% of females. Tobacco is a highly addictive substance, and the vast majority of users smoke on a daily basis. With the exception of the African and Eastern Mediterranean Regions, smoking prevalence is declining in all world regions; about half of all smokers live in either the South-East Asia or the Western Pacific Region. Smoking prevalence is also declining when viewed from a country income group perspective (high-, middle-, and low-income). The fact that the number of adult tobacco users worldwide is not declining is primarily attributable to population growth. About 7% of youth ages 13–15 worldwide smoke cigarettes, including about 9% of boys and 4.5% of girls. In many countries, particularly low-income countries and lower middle-income countries, women's smoking prevalence remains low, often because of socio-cultural and economic factors discouraging tobacco use among women. As these barriers fall, continued efforts will be required to ensure that women's tobacco use does not rise.

The number of smokeless tobacco users worldwide is estimated at 346 million, most of whom (86%) live in the South-East Asia Region. Approximately 4% of youth ages 13–15 worldwide use smokeless tobacco; as with adults, most 13- to 15-year-old smokeless tobacco users live in the South-East Asia Region. An estimated 600,000 deaths worldwide in 2004 (1% of global mortality) were attributed to SHS exposure. Data from countries participating in the GATS show a wide range of SHS exposure at home and at work for both men and women. Data from the GYTS also show that a substantial proportion of youth ages 13–15 years are exposed to SHS in the home and in other locations.

Studies from a number of countries document a disproportionate burden of tobacco use and SHS exposure among disadvantaged groups, which are defined by income, race/ethnicity, geography, and other factors. In most countries, poor people are more likely to smoke than their more affluent counterparts, which contributes to a disproportionate burden of disease and death among the poor. The four-stage model of the cigarette epidemic developed by Lopez and colleagues provides a useful illustration of the stages of development of the tobacco epidemic. Implementation of strong tobacco control measures can hasten countries' progress through the stages of this model, resulting in lower prevalence of tobacco use and a lower burden of disease.

## Research Needs

Ongoing surveillance of all forms of tobacco use is critical to understanding the tobacco epidemic and its shifting global impact, including the burden of disease resulting from tobacco use. It is important that surveillance systems monitor and adapt to changes in the tobacco product landscape. Information is especially needed on patterns of use of non-cigarette tobacco products, for which data are more limited. Although the body of evidence on the health effects of cigarette smoking is extensive, the long-term health effects of other tobacco products, including use of waterpipe and smokeless tobacco, are not as well understood. Finally, more information is also needed on the prevalence and patterns of ENDS use, as well as the short- and long-term health effects of these products, including the effect of ENDS aerosol exposure on nonusers.

## Conclusions

1. There are about 1.1 billion smokers in the world, and about 4 in 5 smokers live in low- and middle-income countries. Nearly two-thirds of the world's smokers live in 13 countries.
2. Substantial progress has been made in reducing tobacco smoking in most regions, especially in high-income countries. Overall smoking prevalence is decreasing at the global level, but the total number of smokers worldwide is still not declining, largely due to population growth. Unless stronger action is taken, it is unlikely the world will reach the WHO Member States' 30% global reduction target by 2025.
3. Globally, more than 80% of the world's smokers are men. Differences in prevalence between male and female smokers are particularly high in the South-East Asia and Western Pacific Regions and in low- and middle-income countries.
4. Globalization and population migration are contributing to a changing tobacco landscape, and non-traditional products are beginning to emerge within regions and populations where their use had not previously been a concern.
5. An estimated 25 million youth currently smoke cigarettes. Although cigarette smoking rates are higher among boys than girls, the difference in smoking rates between boys and girls is narrower than that between men and women. Smoking rates among girls approach or even surpass rates among women in all world regions.
6. Worldwide, an estimated 13 million youth and 346 million adults use smokeless tobacco products. The large majority of smokeless tobacco users live in the WHO South-East Asia Region. Smokeless tobacco use may be undercounted globally due to scarcity of data.
7. Secondhand smoke exposure remains a major problem. In most countries, an estimated 15%–50% of the population is exposed to secondhand smoke; in some countries secondhand smoke exposure affects as much as 70% of the population.
8. Annually, around 6 million people die from diseases caused by tobacco use, including about 600,000 from secondhand smoke exposure. The burden of disease from tobacco is increasingly concentrated in low- and middle-income countries.

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