Tobacco Use

Chapter 11

Who Uses Tobacco?

- Rates of smoking vary based on gender, age, ethnicity, and educational level
- Young people and tobacco

  "Occasional smokers"

  It's a crime to sell tobacco products to those under 18
- Gender and smoking

  Women under 23 are becoming smokers at a faster rate than the rest of the population
- Tobacco and other drugs

  Smoking is high among alcoholics and heroin addicts

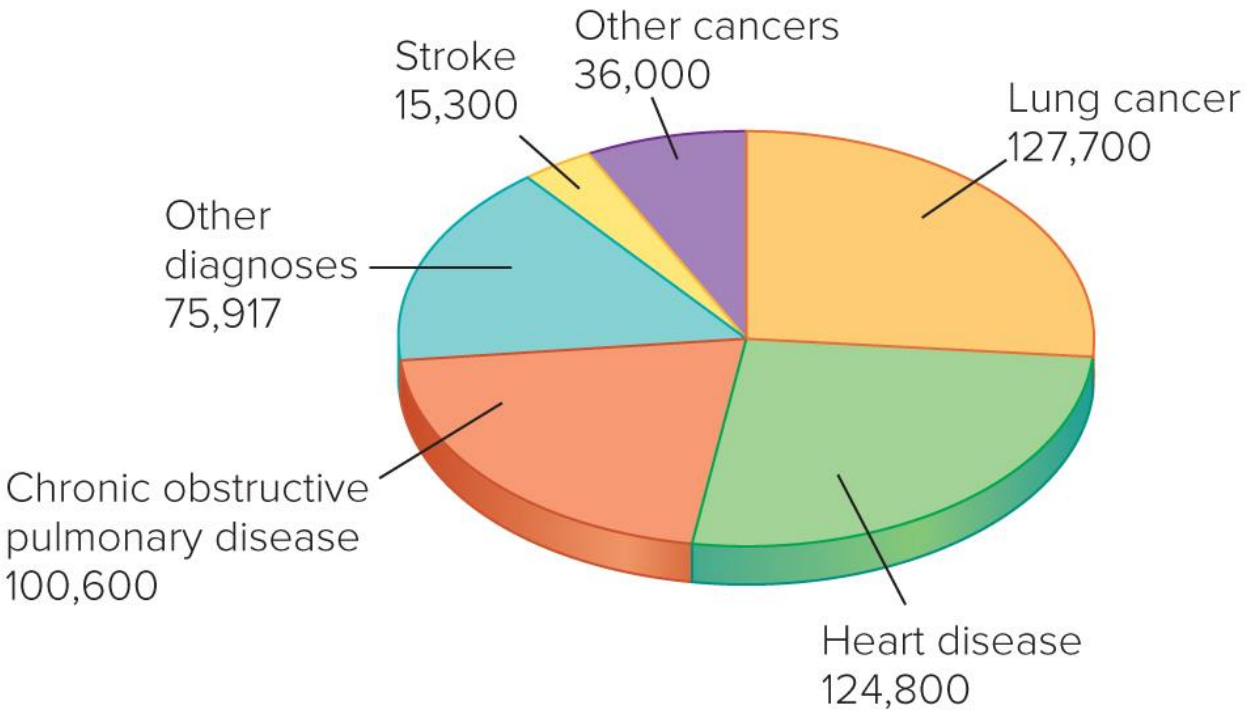


Figure 11.1 Estimated Annual Mortality among Cigarette Smokers Directly Attributable to Smoking

Note: Data based on final death data from 2005–2009.

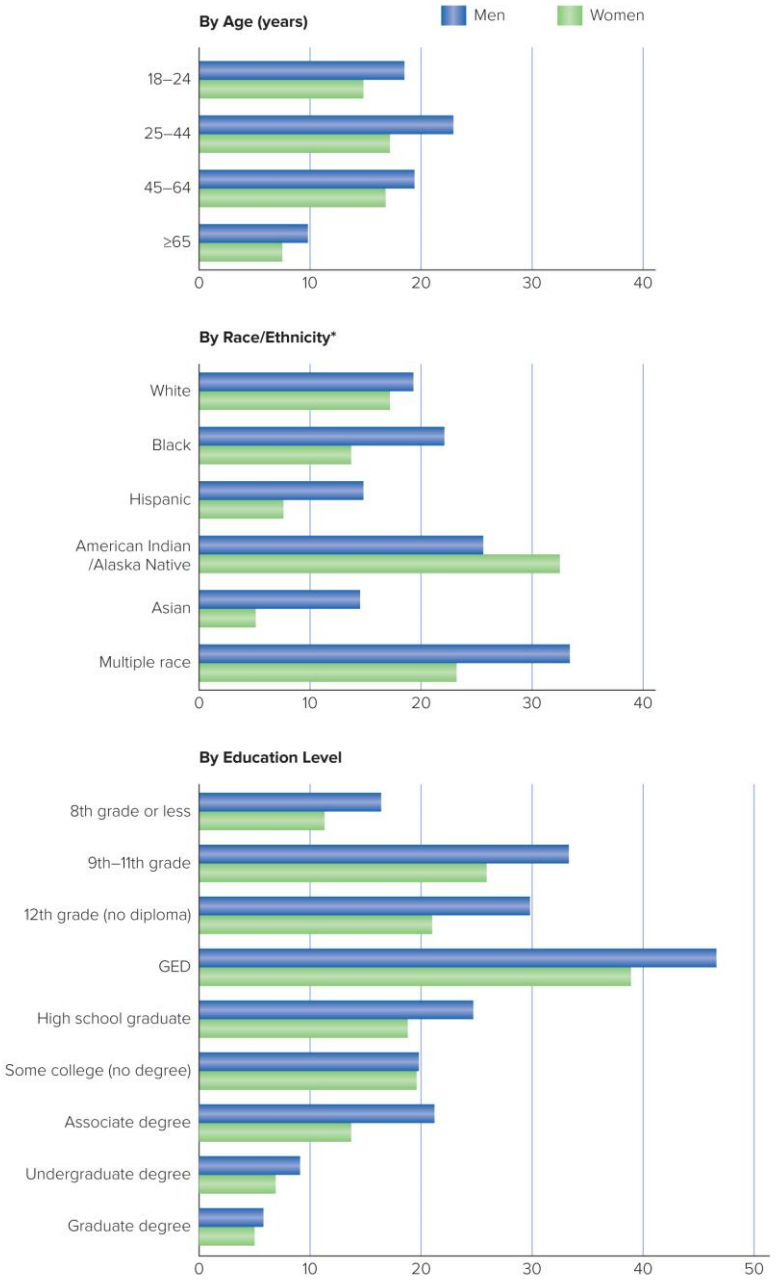
SOURCE: U.S. Department of Health and Human Services. 2014. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Figure 11.2

Who Smokes Cigarettes?

Overall 16.8% of American adults currently smoke cigarettes—18.8% of men and 14.8% of women. However, smoking rates vary significantly by age, race/ethnicity, and education level.

*Unless noted, all racial/ethnic groups are non-Hispanic; Hispanics can be of any race.



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SOURCE: Centers for Disease Control and Prevention. 2015. Current cigarette smoking among adults—United States, 2005–2014. Morbidity and Mortality Weekly Report 64(44): 1233–1240.

Why People Use Tobacco

- Nicotine addiction
  - Nicotine is a powerful psychoactive drug
    - Considered by many to be the most physically addicting of the psychoactive drugs
  - Reaches the brain via the bloodstream in seconds
    - Releases powerful chemical messengers
    - Modulates everyday emotions
  - Loss of control
  - Tolerance and withdrawal

Social and Psychological Factors

- Established habits or cues that trigger smoking

  Secondary reinforcers

  – Act with the physiological addiction to keep the user dependent

Genetic Factors

- CYP2A6 enzyme
  - Influences the way in which nicotine is metabolized
  - In people with slow CYP2A6 metabolism, nicotine remains in the system longer
- *DRD2* gene
  - Associated with the brain chemical dopamine
  - Influences the progression of smoking in adolescence

Why Start in the First Place?

- In the U.S., 90% of adult smokers started before 18
- Characteristics that increase the risk:
  - Parent or sibling who uses tobacco
  - Peers who use tobacco
  - Child comes from a blue-collar family
  - Child comes from a low-income home
  - Family is headed by a single parent
  - Child drops out of school
  - Child has positive attitudes about tobacco use

Why Start in the First Place? (2)

- Rationalizing the dangers
  - Sense of invincibility
- Emulating smoking in the media
  - Causal relationship between media portrayals of smoking and smoking initiation among young moviegoers

Health Hazards

- Tobacco smoke is a toxic mix that adversely affects nearly every part of the body
- It contains hundreds of damaging chemical substances
    - Unfiltered cigarettes: 5 billion particles per cubic millimeter, 50,000 times more particles than polluted urban air
- Condensed particles in the cigarette produce a brown, sticky mass called cigarette tar

Carcinogens and Poisons

- Sixty-nine chemicals in tobacco smoke are linked to cancer
  - Some are carcinogens—they directly cause cancer
  - Others are cocarcinogens—chemicals that combine with other chemicals to cause cancer
- Tobacco also contains poisonous substances
  - Arsenic and hydrogen cyanide
  - Nicotine
  - Carbon monoxide
    - Displaces oxygen in red blood cells

Additives

- Flavor components
  - Added sugars enhance the addictive effect
  - Bronchodilators and ammonia boost nicotine delivery
- Some additives are used to make sidestream smoke less objectionable

Tobacco Smoke: A Toxic Mix

- Inhaling tobacco smoke
  - More chemicals are absorbed during the last third of a cigarette
- “Reduced harm” cigarettes
  - There is no such thing as a safe cigarette
- Menthol cigarettes
  - Smoked by 70% of African American smokers
  - Absorb more nicotine and metabolize it slower
  - Have an anesthetizing effect

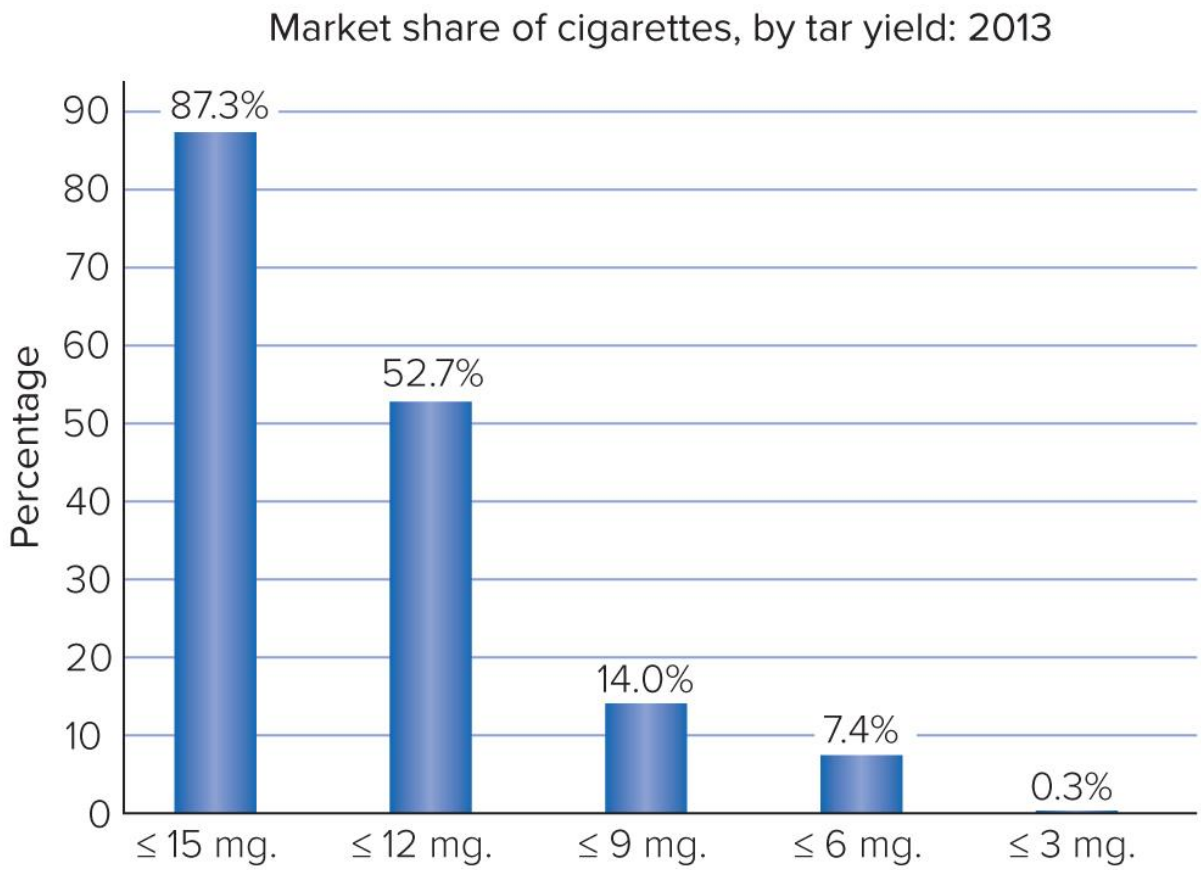

Figure 11.3 U.S. Market Share of Cigarettes, by Tar Level: 2013

Higher-tar cigarettes have much greater market share, with only 14% of the market going to cigarettes with a tar level of 9 mg or less.

SOURCE: Federal Trade Commission. 2016. Federal Trade Commission Cigarette Report for 2013. Washington, DC: Federal Trade Commission.

The Immediate Effects of Smoking

- Beginning smoker often has symptoms of mild nicotine poisoning
  - Dizziness, faintness, rapid pulse; cold, clammy skin; nausea, vomiting, diarrhea
- Depending on the dosage, nicotine can excite or tranquilize the nervous system
  - Stimulates the cerebral cortex
  - Stimulates the discharge of adrenaline
  - Has numerous physiological effects on the body

The Long-Term Effects of Smoking

- Cardiovascular disease
  - Coronary heart disease (CHD)
  - Atherosclerosis
    - Plaque on artery walls causes arteries to narrow and stiffen
  - Angina pectoris
  - Myocardial infarction
  - Stroke
  - Aortic aneurysm
  - Pulmonary heart disease

The Long-Term Effects of Smoking (2)

- Lung cancer and other cancers
  - Smoking is the primary cause of lung cancer
  - The chemical benzo(a)pyrene effects the lung's cells
  - Smoking is also linked to cancer of the mouth, pharynx, esophagus, larynx, pancreas, bladder, kidney, breast, cervix, stomach, liver, colon, and skin
- Chronic obstructive pulmonary disease (COPD)
  - Emphysema; chronic bronchitis
- Other respiratory damage
  - Damage to cilia and macrophages

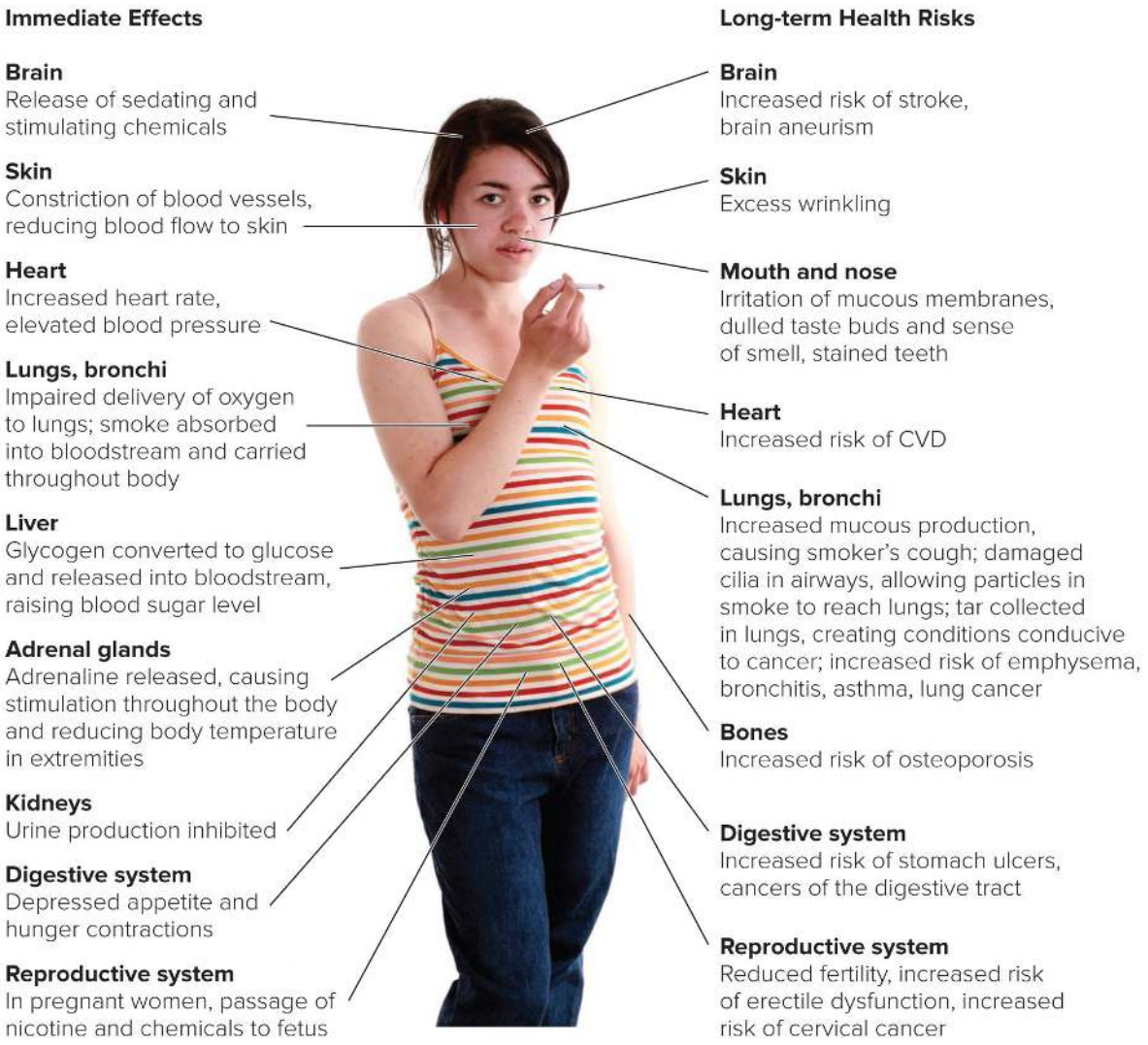

Figure 11.4 Tobacco Use: Immediate Effects and Long-Term Health Risks

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The Long-Term Effects of Smoking (3)

- As soon as someone stops smoking, steady improvement in overall lung function takes place

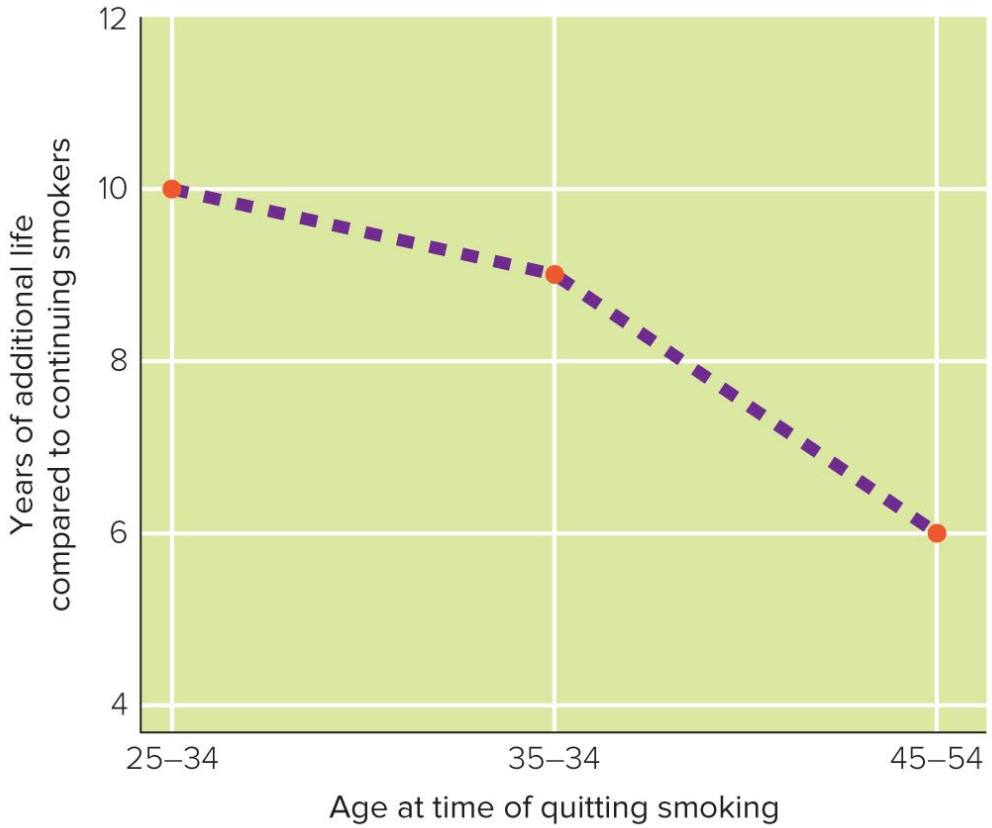

Figure 11.5 Increased Life Expectancy

Data show that quitting smoking at younger ages substantially reduces the risk of death from smoking-related causes: Quitting at age 25–34 adds 10 more years, and at age 45–54 adds 6 years.

SOURCE: Adapted from Jha, P., et al. 2013. 21st-century hazards of smoking and benefits of cessation in the United States. New England Journal of Medicine 368(4): 341–50.

The Long-Term Effects of Smoking (4)

- Additional health, cosmetic, and economic concerns
  - Ulcers
  - Erectile dysfunction
  - Reproductive health problems
  - Dental diseases
  - Diminished physical senses
  - Injuries
  - Cosmetic concerns
  - Economic costs
    - Pack-a-day habit: more than $2000 per year

The Long-Term Effects of Smoking (5)

- Cumulative effects
  - Reduced life expectancy
  - Diminished quality of life
    - Greater rate of acute and chronic disease
- Gender differences in health hazards
  - Women are at greater risk for smoking-related blood clots, stroke, and lung cancer
  - Tobacco use is associated with sex-specific health problems

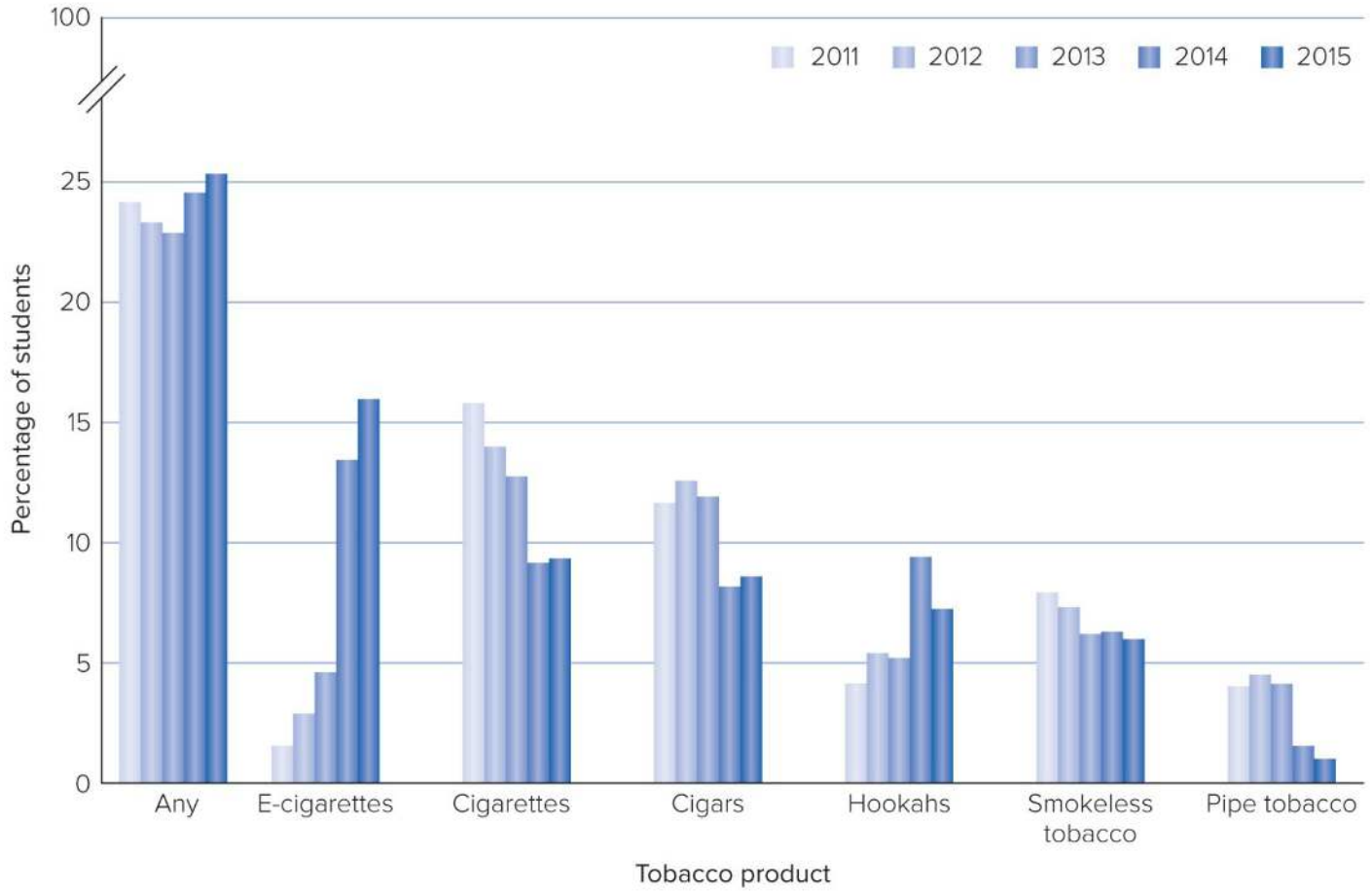

Figure 11.6 **Estimated Percentage of High School Students Who Currently Use Any Tobacco Products, National Youth Tobacco Survey, 2011–2015**

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SOURCE: Centers for Disease Control and Prevention. 2016. Tobacco use among middle and high school students—United States, 2011-2015. Morbidity and Mortality Weekly Report 65(14): 361–367.

Risks Associated with Other Forms of Tobacco Use

- Spit (smokeless) tobacco
  - Snuff, chewing tobacco (chew), *snus*
  - Decreased sense of taste and smell
  - Increased risk of gingivitis, oral cancer
- Cigars and pipes
  - Nicotine is absorbed through the gums
  - Inhalation increases risk

Risks Associated with Other Forms of Tobacco Use (2)

- Clove cigarettes
  - Twice the tar, nicotine, and carbon monoxide
- Bidis
  - Four times more nicotine and twice the amount of tar
- Hookah
- E-cigarettes
  - Although advertised as a way to quit smoking, no evidence submitted to the FDA supports this claim

The Effects of Smoking on the Nonsmoker

- Environmental tobacco smoke

  EPA has designated environmental tobacco smoke (ETS) a Class A carcinogen

  Surgeon General: there is no safe level of exposure

  Two types of ETS

  - Mainstream smoke

    Smoke exhaled by smokers

  - Sidestream smoke

    Smoke from the burning end of a cigarette, cigar, or pipe

    Unfiltered, it has more harmful chemicals

The Effects of Smoking on the Nonsmoker (2)

- ETS effects

  Coughs, headaches, nasal discomfort, eye irritation, breathlessness, and sinus problems

  - Allergies and asthma are aggravated
  - Increased risk for breast and cervical cancers

  Cause of 7,300 deaths a year due to lung cancer and 34,000 deaths from heart disease

- Infants, children, and ETS

  Increased risk of SIDS

  Asthma and ear infections

  Lower test scores on reading and reasoning

Smoking and Pregnancy

- Linked to miscarriage, ectopic pregnancy, and low birth weight
- Higher rates of colic, cleft lip and palate, and impaired lung function
- Behavioral problems and impairments in growth and intellectual development

The Cost of Tobacco Use to Society

- Annual health care expenditures related to smoking exceed $96 billion
- Annual cost of lost productivity is nearly $97 billion
- Costs far exceed the tax revenues from the sale of tobacco products

    Average cigarette tax was $2.66 per pack in 2016

What Can Be Done?

- Action at the local level
- Action at the state and federal levels
    - State anti-tobacco laws
- FDA regulation of tobacco
- International action
    - WHO (World Health Organization)
- Action in the private sector
- Individual action

How a Tobacco User Can Quit

- Benefits of quitting are immediate
- Options for quitting
  - Behavior change
    - Need a strategy for success
  - Telephone quitlines
    - 1-800-QUITNOW
  - Smoking cessation products
    - Chantix (varenicline), Zyban (bupropion)
  - Nicotine replacement products
    - Patches, gums, lozenges, nasal sprays, and inhalers

Table 11.1 Benefits of Quitting Smoking

Within 20 minutes of your last cigarette:

- Blood pressure drops to normal
- Pulse rate drops to normal
- Temperature of hands and feet increases to normal
- You stop polluting the air

8 hours:

- Carbon monoxide level in blood drops to normal
- Oxygen level in blood increases to normal

24 hours:

- Chance of heart attack decreases

48 hours:

- Nerve endings start regrowing
- Ability to smell and taste is enhanced

2–3 months:

- Circulation improves
- Walking becomes easier
- Lung function increases up to 30%

1–9 months:

- Coughing, sinus congestion, fatigue, and shortness of breath all decrease

1 year:

- Heart disease death rate is half that of a smoker

5 years:

- Stroke risk drops nearly to the risk for nonsmokers

10 years:

- Lung cancer death rate drops to 50% of that of continuing smokers
- Incidence of other cancers (mouth, throat, larynx, esophagus, bladder, kidney, and pancreas) decreases
- Risk of ulcer decreases

15 years:

- Risk of lung cancer is about 25% of that of continuing smokers
- Risks of heart disease and death are close to those of nonsmokers

SOURCES: BeTobaccoFree.gov. n.d. Get on a Path to a Healthier You (Quitting) (http://betobaccofree.hhs.gov/gallery/quit.html); U.S. National Library of Medicine. 2013. Benefits of Quitting Tobacco (https://www.nlm.nih.gov /medlineplus/ency/article/007532.htm).

Review

- Explain the demographic patterns related to tobacco use
- List the reasons why people use tobacco
- Explain the health hazards associated with tobacco use
- Discuss the effects of smoking on nonsmokers
- List social and legislative actions that can be taken to combat smoking
- Explain strategies that help people stop using tobacco

Long image descriptions

APPENDIX A

Figure 11.2 Who Smokes Cigarettes? Appendix

By age, the highest proportion of smokers are found among men and women aged 25–44. The next highest group is aged 45–64. The third, 18–24. The fourth, 65 and older.

By race/ethnicity, the highest proportion of smokers are found among American Indians and Alaska Natives (more women than men); and among those who claim multiple races (more men than women).

By education level, the highest proportion of smokers, both men and women, are found among those who hold a GED. The next highest groups are those who have completed 9th–12th grade but have not earned a diploma. The greater amount of education, the lower the proportion of smokers.

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Figure 11.4 Tobacco Use: Immediate Effects and Long-Term Health Risks Appendix

Immediate effects:

Brain: Release of sedating and stimulating chemicals

Skin: Constriction of blood vessels, reducing blood flow to skin

Heart: Increased heart rate, elevated blood pressure

Lungs, bronchi: Impaired delivery of oxygen to lungs; smoke absorbed into bloodstream and carried throughout body

Liver: Glycogen converted to glucose and released into bloodstream, raising blood sugar level

Adrenal glands: Adrenaline released, causing stimulation throughout the body and reducing body temperature in extremities

Kidneys: Urine production inhibited

Digestive system: Depressed appetite and hunger contractions

Reproductive system: In pregnant women, passage of nicotine and chemicals to fetus

Long-term health risks:

Skin: Excess wrinkling

Mouth and nose: Irritation of mucous membranes, dulled taste buds and sense of smell, stained teeth

Heart: Increased risk of CVD

Lungs, bronchi: Increased mucous production, causing smoker's cough; damaged cilia in airways, allowing particles in smoke to reach lungs; tar collected in lungs, creating conditions conducive to cancer; increased risk of emphysema, bronchitis, asthma, lung cancer

Bones: Increased risk of osteoporosis

Digestive system: Increased risk of stomach ulcers, cancers of the digestive tract

Reproductive system: Reduced fertility, increased risk of erectile dysfunction, increased risk of cervical cancer

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Figure 11.6 Estimated Percentage of High School Students Who Currently Use Any Tobacco Products, National Youth Tobacco Survey, 2011–2015 Appendix

Of those students, in 2015, over 15% reported using e-cigarettes; about 9% used cigarettes; about 8% used cigars; about 7% used hookahs; about 6% used smokeless tobacco; and about 2% used pipe tobacco.

Use of e-cigarettes rose dramatically in this period, while use of cigarettes, cigars, smokeless tobacco, and pipe tobacco has fallen, most significantly in 2014 and 2015. Use of hookahs peaked in 2014 and has since fallen, though not yet to previous levels.

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