DRUGS AND SOCIETY

FOURTEENTH EDITION

GLEN R. HANSON
PETER J. VENTURELLI
ANNETTE E. FLECKENSTEIN

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GLEN R. HANSON, PhD, DDS
Vice Dean
Professor, Pharmacology
School of Dentistry
University of Utah
Salt Lake City, Utah

PETER J. VENTURELLI, PhD
Professor Emeritus
Department of Sociology and Criminology
Valparaiso University
Valparaiso, Indiana

ANNETTE E. FLECKENSTEIN, PhD
Professor
School of Dentistry
University of Utah
Salt Lake City, Utah

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World Headquarters
Jones & Bartlett Learning
5 Wall Street
Burlington, MA 01803
978-443-5000
info@jblearning.com
www.jblearning.com

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PREFACE

This *Fourteenth Edition* continues a long tradition of providing the most accurate, recent, and accessible information on drug use, misuse, and abuse, available in a form that is ideally suited for students at all college levels in the medical, social, and psychological fields. Thus, this new version of *Drugs and Society* further enhances its reputation as one of the leading texts on drug use and abuse. The authors have integrated their mastery in the fields of drug abuse, pharmacology, and sociology by using their expertise and knowledge of teaching, research experiences, and drug prevention and treatment to create an edition that reflects the most important and current information relative to drug abuse issues available in a textbook. For example, this edition includes new information on important topics, such as:

1. The potential value of genetics in assessing risk, consequences, and even the possible treatment of drug use disorder or addiction;
2. Discussion of the abuse and extent of performance-enhancing drugs in athletic and sport activity;
3. Statistics of use and the impact of drugs of abuse;
4. The most recent findings concerning the extent of vaping;
5. The relentless escalation of prescription abuse and related overdose deaths by opioid analgesics and the increased fatality when mixing opioids and other drugs with sedative properties, such as valium-type medications;
6. The characteristics of alcohol use and abuse including major costs to society;
7. The pattern of methamphetamine resurgence use in the United States and its trafficking patterns from Mexico;
8. The recent connections between methamphetamine and heroin/opioid use;
9. The status of clinical trials for the use of hallucinogenic drugs such as Ecstasy (MDMA) to treat mental conditions such as posttraumatic stress disorder and the use of ketamine to treat depression;
10. Update on the problems associated with rapidly escalating drug costs in the United States and how to address these challenges;
11. Tobacco regulation by the Food and Drug Administration and the continued increase in the popularity of e-cigarettes; and
12. Recent changes in most state marijuana laws in the United States that legally redefine marijuana as medicine for neurological and mental health issues and as a legal drug for recreational marijuana use.

Drugs and Society is an exceptionally comprehensive text on drug use and abuse and drug-related problems, with current and updated references to substantiate and support the latest findings about drug use and abuse information. This text is also written on a personal level, and directly addresses the drug information that college and university students need from the sociological, psychological, and pharmacological perspectives, addressing both micro- and macro-level drug use and abuse information. Many chapters include excerpts from personal experiences with recreational drug users, habitual (often addicted) drug users, and former drug users. Students will find these personal accounts interesting and insightful. This particular approach has been inspired by instructors, students, and reviewers, resulting in a truly unique text that combines comprehensive presentation of the latest drug information with personal accounts.

Drugs and Society is a multiperspective text offering university students from other disciplines a better understanding of drug use and abuse. Students in nursing, physical education or kinesiology, and other social sciences such as psychology, sociology, criminology or criminal justice, social work, history, and economics will find that our text provides useful and timely perspectives and information to help them understand the following:

- Social, psychological, pharmacological, and biological explanations for why drug use and abuse occur
- The outcomes of drug use and abuse
- How to prevent and treat drug use and abuse
- How drugs and medications can be effectively used for therapeutic purposes

To achieve these goals, we have presented the most current, objective, and authoritative views on drug abuse in an easily understood manner. The fourteenth edition of *Drugs and Society* continues to teach students from different disciplines how to understand the complexity of drug use and abuse from pharmacological, neurobiological, psychological, and sociological perspectives.

What Is New and Improved?

Drugs and Society, Fourteenth Edition includes updated statistics and current examples of the key principles being taught in this text and frequently uses the new DSM-5 as a source for updated information. The new coverage includes discussion of the following topics.

- The most recent information on developments in states that have or intend to legalize recreational and medical marijuana use, as well as coverage of the major differences between the three main strains of marijuana; namely, *Cannabis sativa*, *Cannabis indica*, and *Cannabis ruderalis*.
- The current status of prescription abuse, including opiate painkillers, stimulants (e.g., performance enhancers), and the central nervous system (CNS) sedative-hypnotics.
- Details on public advertising of prescription products and resulting consumer controversies.
- The most recent information on the personal and social consequences of use of methamphetamine and narcotic analgesics.
- The latest status of over-the-counter (OTC) stimulants and decongestants as well as abuse of OTC products and the efforts to switch more prescription drugs to OTC status.
- Updated data and major drug use findings of drug abuse by junior high, high school, college and university students, adolescents, young adults, middle-aged adults, and senior citizens.
- Coverage of current topics such as steroid abuse in major professional sports, OxyContin abuse, restrictions on pain pills, marijuana legalization for medical and recreational use, heroin potency, designer drugs, synthetic drugs (Spice and K2), and marijuana wax.
- How risk and protective factors directly affect drug abuse.
- The most recent information on alcohol and other drug use problems in preadolescent, adolescent, college, and noncollege populations.
- Recent information on "vaping."
- The most recent survey data from the National Household Survey on Drug Use and Health (NHSDUH), *Monitoring the Future* studies, the Centers for Disease Control and Prevention (CDC), the Center for Behavioral Health Statistics and Quality (CBHSQ), the Substance Abuse and Mental Health Services Administration (SAMHSA), the U.S. Department of Justice (USDOJ), the National Council on Alcoholism and Drug Dependence (NCADD), the Bureau of Justice Statistics (BJS), the National Institute on Drug Abuse (NIDA), and the World Health Organization (WHO).

Chapter Breakdown

The multidisciplinary material in the text encompasses pharmacological, biomedical, sociological, and social-psychological perspectives.

Chapter 1 provides a thorough overview of the historical and current dimensions of drug use (statistics and trends) and the most common currently abused licit (such as OTC and prescription drugs) and illicit types of drugs. Included are the latest findings regarding the abuse of stimulants (including Ritalin and Adderall), bath salts, prescription and performance-enhancing drugs, hallucinogens and psychedelics and other similar drugs, depressants, alcohol, nicotine, cannabis (marijuana and hashish), synthetic cannabinoids, designer drugs and synthetic drugs or synthetic opioids, anabolic steroids, inhalants and organic solvents, and narcotics and opiates.

Chapter 2 comprehensively explains drug use and abuse and addiction from multidisciplinary theoretical standpoints, including the latest theoretical, biological, psychological, social-psychological, and sociological perspectives. This chapter also theoretically explains the use and abuse of illicit drugs.

Chapter 3 discusses new drug development (both OTC and prescription) and how the law deals with drugs of abuse and individuals who abuse them.

Chapter 4 helps students understand the basic biochemical operations of the nervous and endocrine systems and explains how psychoactive drugs and anabolic steroids alter such functions.

Chapter 5 instructs students about the factors that determine how drugs affect the body. This chapter also details the physiological and psychological variables that determine how and why people respond to drugs used for therapeutic and recreational purposes.

Chapters 6 through 14 focus on specific drug groups that are commonly abused in the United States. Those drugs that depress brain activity are discussed in the following chapters:

- **Chapter 6** Sedative-hypnotic agents
- **Chapters 7** Alcohol use from a pharmacological perspective
- **Chapter 8** Alcohol use from a social scientific and behavioral perspective
- **Chapter 9** Opioid narcotics

Drugs that stimulate brain activity are covered in the following chapters:

- **Chapter 10** Amphetamines, bath salts
- **Chapter 11** Nicotine

The last major category of substances of abuse is hallucinogens, also known as *psychedelics*, which generally alter and distort sensory perception. These substances are discussed in the following chapters:

- **Chapter 12** Hallucinogens, such as LSD, mescaline, Ecstasy, and PCP
- **Chapter 13** Marijuana, marijuana wax, and synthetic cannabinoids (Spice-related types of drugs)
- **Chapter 14** Inhalants

Although most drugs of abuse cause more than one effect (e.g., cocaine can be a stimulant and have some hallucinatory properties), the classification we have chosen for this text is frequently used by experts and pharmacologists in the drug abuse field and is based on the most likely drug effect. All of the chapters in this section are similarly organized. They discuss the following:

- the historical origins and evolution of the agents so students can better understand society's attitudes toward, and regulation of, these drugs;
- previous and current clinical uses of these drugs to help students appreciate distinctions between therapeutic use and abuse;
- patterns of abuse and distinctive features that contribute to each drug's abuse potential; and
- nonmedicinal and medicinal therapies for drug-related dependence, withdrawal, and abstinence.

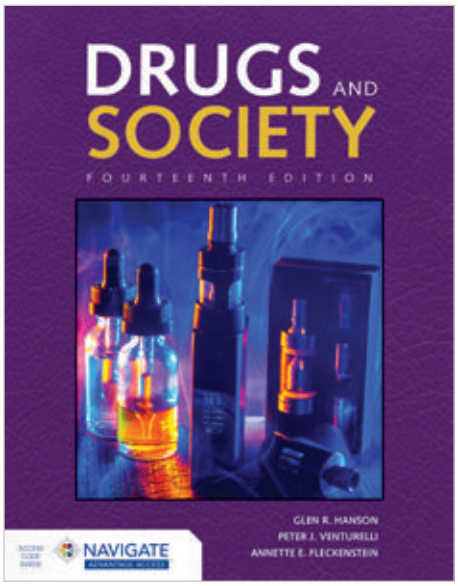
Chapter 15 explores the topic of drugs and drug therapy. Like illicit drugs, nonprescription, prescription, and herbal drugs can be misused if not understood. This chapter helps students appreciate the benefits of proper drug use as well as recognize that licit (legalized) drugs also can be problematic—and a problem that has been declared by many experts, politicians, and news media to be the greatest drug abuse issue in the United States. This chapter also discusses the recent surge in abuse of prescription drugs such as opioid painkillers, stimulants, and CNS depressants; the dramatic increase in overdose deaths caused by these substances; and how to mitigate these problems.

Chapter 16 focuses on and examines drug use, drug dependence, and drug abuse in the following seven major drug-using subcultural populations: (1) athletes involved in sports; (2) women; (3) adolescents; (4) college students; (5) HIV and AIDS subpopulations; (6) a percentage of professional actors, actresses, and music celebrities; and (7) Internet users seeking and purchasing illicit drugs.

Chapter 17 explains what is involved in prevention of drug use and abuse. This chapter focuses on the following topics: (1) major factors affecting an individual's use of drugs; (2) major types of drug abuse prevention programs; (3) major types of drug users who must be recognized before creating any effective prevention program; (4) the four levels of comprehensive prevention programs for drug use and abuse; (5) major family factors that can affect the use of drugs; (6) primary prevention programs in higher education; (7) four recent large-scale prevention programs; and (8) two additional prevention measures that may substitute for the attraction to drug use.

Chapter 18 focuses on assessing addiction, the issue of comorbidity, and principles and forms of drug dependence treatment.

HOW TO USE THIS BOOK



Besides including the most current information concerning drug use and abuse topics, each chapter includes updated and helpful learning aids for both students and instructors. Utilizing these feature boxes for classroom or blog discussions and debates or as individual reflective writing assignments can drive stronger comprehension and retention of core concepts while reinforcing critical-thinking skills.

HOLDING THE LINE

States Are Allowing Cannabis Buyers' Clubs

Despite federal drug laws prohibiting the cultivation, possession, use, and sale of marijuana, 33 states plus the District of Columbia have recently enacted the legalization of recreational and medical marijuana. The 33 states are Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Illinois, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Utah, Vermont, Washington, and West Virginia (ProCon.org, 2019). Out of 325,719,178 of U.S. population as of March 17, 2018 (ProCon.org, 2019), the estimated number of medical marijuana users would be 2,132,777 (ProCon.org, 2019).

Why should medically ill patients, those afflicted with AIDS and associated wasting, lack of appetite, nausea, arthritis, hepatitis C, migraines, multiple sclerosis, muscle spasms, chronic pain, glaucoma, and other illnesses (such as posttraumatic stress disorder, depression, or bipolar disorder) or those suffering the deleterious effects of chemotherapy or radiation not be able to legally purchase marijuana if they find relief from the effects of their illnesses? The first cannabis buyers' club began in 1996 when the voting citizens of Marin County, California, passed "Proposition 215, which authorized the use of medical marijuana . . . for those who have a doctor's recommendation" (Nolde, 2002). The main problem facing this club in Marin County, and all the other cannabis buyers' clubs throughout the United States, is that although these 23 states and DC have legalized such enterprises, they continue to violate federal drug laws, causing a conflict between federal and state law. At times, the clubs can be ordered closed by a superior court judge, resulting in federal agents raiding the clubs, confiscating the marijuana, and arresting the owners and operators of these establishments.

To date, this cyclical pattern of raids and arrests by federal officials continues to sporadically occur because of this rift between state and federal laws. The clubs are either for-profit or nonprofit organizations whose sole intent is to distribute marijuana for medicinal purposes when prescribed by a licensed physician. Many of the buyers (known as *patients*) report relief and satisfaction from their use of marijuana. For example, a man named Clay Shinn, 46, was diagnosed with AIDS in 1992. At the time of his interview, he had been going to the Marin Alliance's Cannabis Buyers' Club for five years. "It's made a major difference in my life," he said. After taking his [AIDS] medication morning, afternoon, and evening, he said, "I was always getting nauseated. . . . I could set my watch by it. I hate it. God, it's awful. Now I don't barf anymore" (Nolde, 2002). Another interviewee, who is an arthritic, HIV-positive cabaret performer, said, "After I leave here . . . I won't feel my pain" (Goldberg, 1996). Another man, the club's director, reiterated that, "'You have to be sick or dying' . . . If you are, with a doctor's note to prove that you have AIDS or cancer or another condition with symptoms that marijuana is known to alleviate, Mr. Peron [the club's director] is willing to sell some relief" (Goldberg, 1996). Finally, Dennis Peron, the founder of the San Francisco Buyers' Club, stated, "We have over 400 senior citizens that come here for arthritis, glaucoma, pain, etc. We have an old woman trapped in her wheelchair, day in and day out. Marijuana makes her feel a little bit better. I don't require a letter of diagnosis for people 65 or older—things wear out—or for people who are blind or deaf, as they say it helps their other senses" (Fuhrman, 1995).

What are your views regarding the prescribed use of marijuana, especially when these clubs or cooperatives provide seriously ill patients with a safe and reliable source of medical cannabis information and patient support? What about buying clubs for recreational use of marijuana—are your views similar to buying clubs selling marijuana only for medicinal purposes? Would you support a cannabis buyers' club or cooperative in your community that sells medical marijuana and recreational marijuana? What are your views regarding federal laws that prohibit such establishments while states pass laws allowing these establishments to legally operate? How do you think this current problem of the illegality on the federal level should be resolved? Finally, how do you think this dilemma will be resolved in your lifetime?

Data from Nolde, H. (2002, July 1). Medical pot war rages on. *Marin Independent Journal*. Retrieved from http://cannabisnews.com/news/13/thread13278.shtml; Fuhrman, R. A. (1995). Cannabis buyers' club flourishes in 'Frisco." San Francisco, CA: Cannabis Buyers' Club; Goldberg, C. (1996, February 26). Marijuana club helps those in pain. *The New York Times*. Retrieved from http://query.nytimes.com/gst/fullpage.html?res=9C06E6DF1139F936A15751C0A960958260&sec=&spon=&pagewanted=all; ProCon.org. (2013). How many people in the United State use medical marijuana? Santa Monica, CA: Author. Retrieved from http://medicalmarijuana.procon.org/view.answers.php?questionID=001199; ProCon.org. (2018, May 17). Number of legal medical marijuana patients. Santa Monica, CA: Author; ProCon.org. (2019, July 24). Legal medical marijuana states and DC. Santa Monica, CA: Author.

- **Holding the Line:** Vignettes that help readers assess efforts to deal with drug-related problems.

CASE IN POINT

Specific Signs of Marijuana Use

This excerpt, from the author's files, illustrates labeling theory:

> After my mom found out, she never brought it up again. I thought the incident was over—dead, gone, and buried. Well . . . it wasn't over at all. My mom and dad must have agreed that I couldn't be trusted anymore. I'm sure she was regularly going through my stuff in my room to see if I was still smoking dope. Even my grandparents acted strangely whenever the news on television would report about the latest drug bust in Chicago. Several times that I can't ever forget were when we were together and I could hear the news broadcast on TV from my room about some drug bust. There they all were whispering about me. My grandma asking if I "quitta the dope." One night, I overheard my mother reassure my dad and grandmother that I no longer was using dope. You can't believe how embarrassed I was that my own family was still thinking that I was a dope fiend. They thought I was addicted to pot like a junkie is addicted to heroin! I can tell you that I would never lay such a guilt trip on my kids if I ever have kids. I remember that for [two] years after the time I was honest enough to tell my mom that I had tried pot, they would always whisper about me, give me the third degree whenever I returned late from a date, and go through my room looking for dope. They acted as if I was hooked on drugs. I remember that for a while back then I would always think that if they think of me as a drug addict, I might as well get high whenever my friends "toke up." They should have taken me at my word instead of sneaking around my personal belongings. I should have left syringes lying around my room!

Approximately 17 years after this interview was conducted, this author was able to revisit the same interviewee, who at the time of this second interview was 37 years of age. After showing him the preceding excerpt, he commented,

> You know, Professor, while today marijuana use is no longer such a big deal, I can still tell you that it took years to finally convince my family that I was not a "big time drug user." Though my grandma is now dead, I can still remember how she would look at me when I would tell her that I just smoke it once in a while. I knew she never believed that I was just an occasional user by the look on her face, when she would ask ". . . and last night when you went out, did you smoke the dope again?" My mom, who is now living with her sister, still mentions how I went wild those days when I was drugging it up! Yes, I have to say it had a big impact on me when my own family believed I was a drug addict back then. I will never forget those looks from my family every time I would walk into the house on weekends when I would return from a night out with my friends.

Interview with a 20-year-old male college student at a private university in the Midwest, conducted by Peter Venturelli on November 19, 1993. Second interview with same interviewee male, 37 years of age, June 2010.

- **Case in Point:** Examples of relevant clinical or social issues that arise from the use of each major type of drug.

HERE AND NOW

Spice and K2: Past and Current Usage Rates

Spice, also known as *herbal incense*, is dried, shredded plant material treated with a cannabinoid analog. Although labels on spice products will list the ingredients as "natural" psychoactive plant products, chemical analyses show that their active ingredients are primarily synthetic cannabinoids added to the plant material. These synthetic analogs function similarly to the active ingredient in marijuana, Δ9-THC (SAMHSA, 2014a).

K2 and *Spice* are two names for a more recently created psychoactive designer drug whose dried, leafy, natural herbs are sprayed with a psychoactive chemical; it is then smoked so the user can experience euphoric effects. In 2011, prior to the Synthetic Drug Abuse Prevention Act being signed into law, one in nine U.S. high school seniors reported having used synthetic marijuana. In 2012, a large sample survey found that annual prevalence was 11.4%, ranking synthetic marijuana as the second most widely used class of illicit drug after marijuana among 12th graders (Johnston et al., 2016). In 2018, synthetic marijuana use significantly dropped. Annual use in 2018 among 8th graders was 1.6%, 10th graders 2.9%, and 12th graders 3.5% (NIDA, 2018c).

Eighth, 10th, and 12th graders were asked if they associated a great risk with trying synthetic marijuana once or twice; the results showed that there was quite a low level of perceived risk (only 23% and 25%, respectively, thought there was great risk in using once or twice).

Another study at a large public university in Georgia between November 2011 and March 2012 found that the highest level of use was among male students largely identifying with the lesbian, gay, bisexual, and transgender (LGBT) community. This was the first known study to obtain a detailed profile of users of any type of synthetic cannabinoid. Findings indicated the following:

1. The average age of first use was 18 years.
2. The percentage ever using synthetic cannabinoids was twice as high for males as for females (19% vs. 9%).
3. Heavier users were more likely to identify themselves as LGBT; significantly less usage was found in students identifying themselves as heterosexual.

Earlier findings are that "[e]fforts at the federal and state levels to close down the sale of these substances appear to be having an effect" (Johnston et al., 2016. Overall, beginning in 2015 through 2018, use of synthetic marijuana cannabinoids, (K2 and Spice) have statistically decreased for 8th, 10th, 12th graders and college students).

Data from Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2013). *Monitoring the future national results on drug use: 2012 overview, key findings on adolescent drug use*. Ann Arbor, MI: Institute for Social Research, The University of Michigan; Center for Substance Abuse Research (CESAR). (2013, 20 May). Study finds that 14% of undergraduate students at a Southeastern University report synthetic cannabinoid use; users more likely to be male and identify as LGBT. *CESAR FAX*. Retrieved from http://www.cesar.umd.edu; Johnston, L. D., O'Malley, P. M., & Miech, R. A., Bachman, J. G., & Schulenberg, J. E. (2016, February). *Monitoring the future national survey results on drug use, 1975–2015: Overview, key findings on adolescent drug use*. Ann Arbor, MI: Institute for Social Research, The University of Michigan; National Institute on Drug Abuse (NIDA). (2018c). *Synthetic cannabinoids (K2/Spice)*. Bethesda, MD: Author. Retrieved from https://www.drugabusegabuse.gov/publications/drugfacts/synthetic-cannabinoids-k2spice

- **Here and Now:** Current events that illustrate the personal and social consequences of drug abuse.

- **Family Matters:** Examples of how genetics and heredity contribute to drug abuse and its issues.

FAMILY MATTERS

Addiction Genes

Is it true that addiction related to drug abuse can be associated with a person's genetics? It is well known that genetic variants are likely associated with diseases such as Alzheimer's and Parkinson's. In fact, many Americans are spitting into test tubes and sending their saliva samples to laboratories to assess their risk of developing these neurological and other genetics-related pathologies. What if we could do the same thing for drug addiction—spit into a container and send it off in a mailer and within a few weeks get a report that would tell us the likelihood that sometime during our life we would experience drug addiction? While genetic research does tell us that various aspects of substance abuse have been linked to more than 100 different abnormal gene expressions, the potential of so many drug abuse–related genes suggests that addiction is a complicated behavioral manifestation, which likely means it will be extremely difficult to develop a simple saliva test to reliably warn us of drug addiction vulnerability. So, what is the value of these findings confirming the connection between some abnormal genes and drug addiction? The following are conclusions that we can draw because of the research establishing linkage between addiction and variant gene expression:

- Because genes are associated with the expression of biological elements such as proteins, genetic research demonstrates that the addiction process has organic bases like many other pathological conditions and as such suggests it should be viewed as the consequence of a disease process and not a moral failure. For example, proteins related to abnormal dopamine (neurotransmitter) receptors, abnormal alcohol metabolic products, nausea-producing tobacco by-products and abnormal serotonin uptake transporters are just a few of the variant genes found to be connected with drug abuse problems.
- The identification of so many genetic factors potentially linked to addiction suggests there is no single element required for every expression of addiction, but that addiction is likely caused by a complicated interplay of biology with environment. This has been confirmed by findings that genetics only contribute to ~50% of addiction vulnerability while the balance is associated with experience.
- Even if a person was found to have one of the abnormal genes linked to addiction, this does not mean that problems with drugs are inevitable, but it could suggest that such a person should take greater care to avoid environments or drug consumption that would encourage drug abuse.
- Identification of genes linked to addiction may provide leads for developing effective treatment or prevention strategies. For example, if expression of a specific dopamine receptor was associated with developing addiction, then perhaps medications that block this receptor would have therapeutic value to prevent or treat the related addiction condition.
- The role of genes in the expression of addiction helps us understand the basis for the familial clustering of this drug-related condition. However, it should be remembered as previously mentioned that this does not mean that everyone in the family is destined to have drug problems. It does suggest, however, that everyone in such a family needs to be cautious around these drugs. In addition, these family members should particularly emphasize an antidrug culture in the home.

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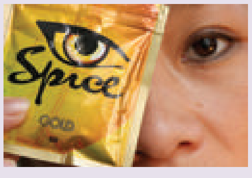
May, H. (2017, Winter). Genes and addiction. Continuum. Salt Lake City, UT: University of Utah. Retrieved from https://continuum.utah.edu/features/genes-and-addiction

PRESCRIPTION FOR ABUSE

How to Spice Things Up

"Mr. Happy," "Scooby Snax," and "Kronic" are street names referring to drugs that in 2018 were linked to 160 cases of severe bleeding and four deaths in central Illinois. These drug products also go by the more familiar terms of *Spice and K2.* Such names represent a large group of chemicals sometimes classified as "synthetic (made in chemistry lab) cannabinoids (i.e., related to marijuana ingredients)." These substances for the most part were originally produced by legitimate research chemists studying the natural cannabinoid system and their chemistry was published in legitimate scientific journals. Once the knowledge of the synthetic chemistry of these substances became public, illicit drug manufacturers used the information to create hundreds of their own adulterated products for sale on the black market. Drugs like Spice and K2 have been called "synthetic marijuana" or "fake weed" to suggest to the unwary buyer that their consumption will in some way mimic the effects caused by smoking marijuana. Because of the national trend throughout the United States to legalize the medical and/or recreational use of marijuana, the association with marijuana-related chemicals is thought to encourage the popularity of these illegal substances and the misconception that Spice, K2-like and related drugs are harmless and maybe even therapeutic. Nothing can be further from the truth. In fact, these designer synthetics often are much more powerful and toxic than THC (the natural ingredient in marijuana), and more potentially dangerous because much of their pharmacology and toxicology is unknown. An additional complication is the lack of consistency in the production of these cannabinoid rip-offs. Even though the packages are very colorful and appear to be high tech, there is no quality control or standardization; thus, there have been many reports of dangerous side effects such as hypertension, a racing heart, agitation, paranoia, psychosis, seizures and nausea and vomiting. When the Spice and K2 substances first appeared in the United States in 2008 they were sold over-the-counter in convenience stores, truck stops and smoke shops because the ingredients were basically unknown and not prohibited. After 2-4 years several states passed "designer" laws banning the sales of these synthetic cannabinoids. Despite this effort, prosecuting the sellers of these drugs was next to impossible because when one of these drugs was identified and outlawed, the store owner quickly replaced it with a substitute chemical with a minor structural change. This modified substance was technically legitimate until dangerous side effects were identified and reported to law enforcement.

It is estimated that ~4% of the population in the United States, mostly males, has tried Spice/K2 substances, many of which are laced with other unknown toxic chemicals. These products often consist of dried herbs that have been sprayed by the cannabinoid-related chemicals which are either rolled into joints or smoked in pipes like typical marijuana. Sometimes the designer chemicals are even added to foods or tea and consumed orally.



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Watson, S. (2018, September). K2/Spice: What to know about these dangerous drugs. WebMD. Retrieved from www.webmd.com/mental-health/addiction/news/20180910/k2-spice-what-to-know-about-these-dangerous-drugs

- **Prescription for Abuse:** Current stories that illustrate the problems of prescription abuse and its consequences.

POINT/COUNTERPOINT

Who Should Know the Results of Your HIV Test If You Test Positive?

Most people would probably want to keep such results private, but would your opinion about HIV-positive people keeping their results confidential change in the following circumstances?

- You require first aid after a serious auto accident, and the emergency medical technician assisting is HIV positive.
- Your doctor is HIV positive.
- Your dentist is HIV positive.

the HIV-positive person, exposing an infected person to social ostracism and gossip and potentially creating fear and panic in others; and (4) potentially destroy a partner or marriage relationship if the significant other or spouse is notified.

Arguments for mandatory disclosure to others potentially affected by the results of this disease include (1) to protect domestic or marital partners, (2) to protect others from HIV-positive workers who could infect them (such as surgeons who are involved in invasive bodily care or procedures), and (3) to honor the public's right to know of the threat of contracting this terminal disease.

Currently, employers cannot legally terminate a

- **Point/Counterpoint:** Features that expose students to different perspectives on drug-related issues and encourage them to draw their own conclusions.

- **Key Terms:** Highlighted definitions of new terminology that are conveniently located on the same page as their discussion in the text.

KEY TERMS

addiction
generally refers to the psychological attachment to a drug; addiction to "harder" drugs such as heroin results in both psychological and physical attachment to the chemical properties of the drug, with the resulting satisfaction (reward) derived from using the drug in question

withdrawal symptoms
psychological and physical symptoms that result when a drug is absent from the body; physical symptoms are generally present in cases of drug dependence to more addictive drugs such as heroin; physical and psychological symptoms of withdrawal include perspiration, nausea, boredom, anxiety, and muscle spasms

drug(s)
any substance that modifies (either by enhancing, inhibiting, or distorting) mind or body functioning

licit drugs
legalized drugs such as coffee, alcohol, and tobacco

illicit drugs
illegal drugs such as marijuana, cocaine, and LSD

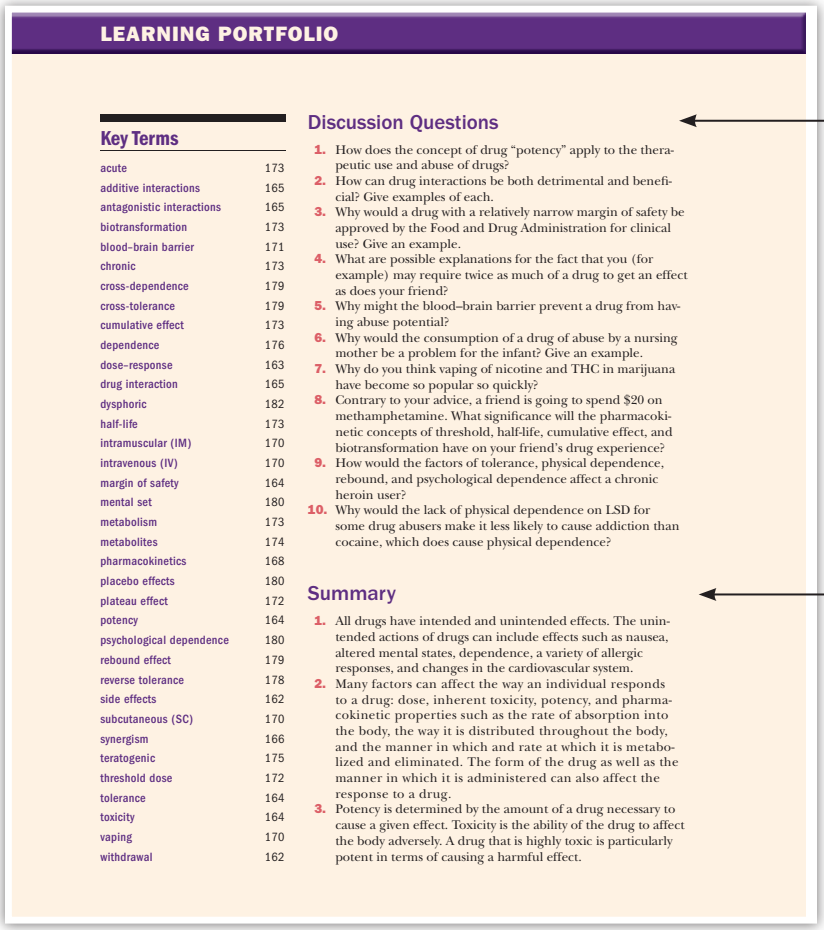
over-the-counter (OTC)
legalized drugs sold without a prescription

Learning Objectives

On completing this chapter, you should be able to:

- Explain how drug use is affected by biological, genetic, and pharmacological factors, as well as cultural, social, and contextual factors.
- Develop a basic understanding of drug use and abuse.
- Explain when drugs were first used and under what circumstances.
- Indicate how widespread drug use is and who potential drug abusers are.
- List four reasons why drugs are used.
- Rank in descending order, from most common to least, the most commonly used licit and illicit drugs.
- Name three types of drug users and explain how they differ.
- Describe how the mass media promotes drug use.
- Explain when drug use leads to abuse.
- List and explain the stages of drug dependence.
- List the major findings regarding drugs and crime.
- Describe employee assistance programs, and explain their role in resolving productivity problems.
- Explain the holistic self-awareness approach.

- **Learning Objectives:** Goals for learning are listed at the beginning of each chapter to help students identify the principal concepts being taught.



LEARNING PORTFOLIO

Key Terms

Discussion Questions

1. How does the concept of drug "potency" apply to the therapeutic use and abuse of drugs?
2. How can drug interactions be both detrimental and beneficial? Give examples of each.
3. Why would a drug with a relatively narrow margin of safety be approved by the Food and Drug Administration for clinical use? Give an example.
4. What are possible explanations for the fact that you (for example) may require twice as much of a drug to get an effect as does your friend?
5. Why might the blood–brain barrier prevent a drug from having abuse potential?
6. Why would the consumption of a drug of abuse by a nursing mother be a problem for the infant? Give an example.
7. Why do you think vaping of nicotine and THC in marijuana have become so popular so quickly?
8. Contrary to your advice, a friend is going to spend $20 on methamphetamine. What significance will the pharmacokinetic concepts of threshold, half-life, cumulative effect, and biotransformation have on your friend's drug experience?
9. How would the factors of tolerance, physical dependence, rebound, and psychological dependence affect a chronic heroin user?
10. Why would the lack of physical dependence on LSD for some drug abusers make it less likely to cause addiction than cocaine, which does cause physical dependence?

Summary

1. All drugs have intended and unintended effects. The unintended actions of drugs can include effects such as nausea, altered mental states, dependence, a variety of allergic responses, and changes in the cardiovascular system.
2. Many factors can affect the way an individual responds to a drug: dose, inherent toxicity, potency, and pharmacokinetic properties such as the rate of absorption into the body, the way it is distributed throughout the body, and the manner in which and rate at which it is metabolized and eliminated. The form of the drug as well as the manner in which it is administered can also affect the response to a drug.
3. Potency is determined by the amount of a drug necessary to cause a given effect. Toxicity is the ability of the drug to affect the body adversely. A drug that is highly toxic is particularly potent in terms of causing a harmful effect.

- **Discussion Questions:** Provocative and engaging questions at the end of each chapter encourage students to discuss, ponder, and critically analyze their own feelings and biases about the information presented in the book.

- **Summary:** Concise summaries found at the end of each chapter correlate with the learning objectives.

Because of these unique features, we believe that this edition of *Drugs and Society* is particularly "user friendly," has the most current and accurate information available in a textbook, and will encourage student motivation and learning.

Resources to Accompany *Drugs and Society, Fourteenth Edition*

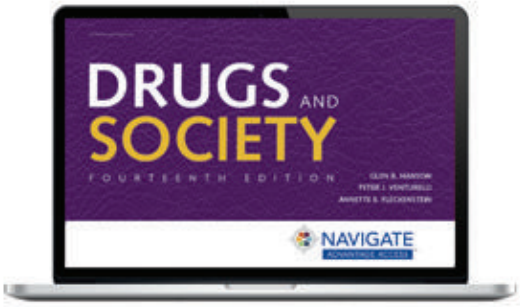
Navigate Advantage Access for Drugs and Society, Fourteenth Edition is a complete, interactive online courseware solution combining authoritative content with interactive tools, assessments, and grading functionality.

This online course combines a host of interactive activities to facilitate learning and allow students to check their progress using quizzes and assessments. Course setup is easy with the preplanned lessons and lecture outlines found within the platform. *Navigate* is flexible and allows instructors to customize content. Automatic grading saves time and provides on-demand analysis of how students are progressing in the course, allowing the instructor to tailor the teaching based on student needs. Other tools such as a built-in calendar, system email, and a robust grade book are also available within *Navigate*.

With *Navigate Advantage Access*, students can immediately evaluate their understanding of important concepts and objectives by easily toggling between textbook narrative, activities, and assessments. This enables them to process, synthesize, and retain course concepts in less time through rich media content.

Navigate Advantage Access for Drugs and Society, Fourteenth Edition includes the following:

- An interactive, animated eBook with personalization tools such as highlighting, bookmarking, and notes
- Student resources, including a full study guide separated by chapter, a course glossary, slides in PowerPoint format, discussion questions, and more!



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ABOUT THE AUTHORS

Dr. Glen R. Hanson is the vice dean of the School of Dentistry and a professor of pharmacology in the School of Dentistry at the University of Utah. He is also the Senior Advisor for the Mountain Plains PTTC (Prevention Technology Transfer Center), which is supported by the Substance Abuse Mental Health Service Administration of the Department of Heath and Human Services. During his approximately 30 years in academics, he has received more than $30 million from the National Institute on Drug Abuse (NIDA), affiliated with the National Institutes of Health (NIH), to research the neurobiology of drug abuse, and he has authored more than 240 scientific papers and 50 book chapters on the subject. Dr. Hanson has lectured on drug abuse topics throughout the world. He served as the director of the Division of Neuroscience and Behavioral Research at NIDA, after which he became NIDA's acting director from 2001 to 2003. Dr. Hanson works with scientists, public officials, policy makers, and the general public to more effectively deal with problems of drug abuse addiction.

Dr. Peter J. Venturelli has been the coauthor of this text since the second edition of *Drugs and Society* in 1988. In addition to revising this text every two years, the experiences and qualifications of Dr. Venturelli in academia and professional life include publishing research in drug and ethnic anthologies and scholarly journals, authoring approximately 60 conference papers at national professional sociological meetings, serving in elected and administrative positions in professional sociological and drug research associations, receiving research grants involving drug use and ethnicity, authoring the latest drug research, serving as a board member at the Baldwin Research Institute (alcohol and drug retreats), and teaching undergraduate and graduate students for the past 32 years.

Dr. Annette E. Fleckenstein has been a coauthor of *Drugs and Society* since its seventh edition and is a professor and assistant dean in the School of Dentistry at the University of Utah. She has researched the neurobiology of substance abuse for more than 20 years, lectured on topics related to substance abuse throughout the United States and abroad, and authored more than 110 scientific papers and book chapters on this and related subjects. Dr. Fleckenstein has been a NIDA-funded researcher for more than 20 years and has a long history of lecturing to undergraduate, graduate, and professional students.

CHAPTER 1

Introduction to Drugs and Society

Did You Know?

- The popular use of legal drugs, particularly alcohol and tobacco, have caused far more deaths, sickness, violent crimes, economic loss, and other social problems than the use of all illegal drugs combined.
- The effect a drug has depends on multiple factors: (1) the ingredients of the drug and its effect on the body, (2) the traditional use of the drug, (3) individual motivation, and (4) the social and physical surroundings in which the drug is taken.
- The first attempts to regulate drugs were made as long ago as 2240 BC.
- After marijuana, illicit prescription drugs are now the second leading drug of abuse.
- Drug abuse is an "equal-opportunity affliction." This means that drug consumption is found across all income levels, social classes, genders, races, ethnicities, lifestyles, and age groups.
- Among racial and ethnic groups in the United States, past-month illicit drug use is highest among African Americans and whites and lowest among Asians.
- Approximately 70% of drug users in the United States are employed (18 years or older) either full time or part time, and 76% of full- or part-time employees are heavy drinkers.
- In major industry categories, past-month illicit drug use was highest in accommodations and food services; arts, entertainment, and recreation; and management; the highest amount of heavy alcohol use was found in the mining, construction, and accommodations and food services industries.
- Approximately 60% of individuals arrested for most types of crimes test positive for illegal drugs at the time of their arrest.

Learning Objectives

On completing this chapter, you should be able to:

- Explain how drug use is affected by biological, genetic, and pharmacological factors, as well as cultural, social, and contextual factors.
- Develop a basic understanding of drug use and abuse.
- Explain when drugs were first used and under what circumstances.
- Indicate how widespread drug use is and who potential drug abusers are.
- List four reasons why drugs are used.
- Rank in descending order, from most common to least, the most commonly used licit and illicit drugs.
- Name three types of drug users and explain how they differ.
- Describe how the mass media promotes drug use.
- Explain when drug use leads to abuse.
- List and explain the stages of drug dependence.
- List the major findings regarding drugs and crime.
- Describe employee assistance programs, and explain their role in resolving productivity problems.
- Explain the holistic self-awareness approach.

Introduction

Each year, at an accelerating rate, social change driven by technology affects not only us individually but also our families, communities, cities, nation, and the world. It can certainly be said that technology is one of the primary forces driving change in our society and societies worldwide at an unprecedented and relentless speed, affecting our daily living.

As an example of technological change, let us look at the transformation of the landline telephone into cellular phone technology. In all likelihood, your great-grandparents had a single black stationary rotary type of landline phone at home to communicate with friends and family living at a distance, and they shared telephone lines with other families. Your grandparents experienced newer styles of the same telephone, with one or two other telephones installed in other rooms in their apartments and homes. While growing up, your parents had the same landline type of telephone, but it came in an array of colors and was more stylized, and the standard was multiple extensions of this phone throughout their home in bedrooms, hallways, or kitchens. Today, your available technology may still include a landline phone,[1] with additional features such as voice mail, call waiting, call forwarding, and call blocking, to name a few of many other standard feature options available with landline phones.

An outgrowth of the landline phone and the military radiophone, the cell phone is the gadget most of us carry today without any sense of technological awe. With more than 7 billion worldwide subscribers (Nair, 2015), the cell phone and its recent cousin, the smartphone, named as such because it includes additional software functions resembling a computer, are portable warehouses of technological services that connect to a cellular network. Current cell phones can include an array of accessories and services beyond making phone calls, including caller identification; voice messaging; voice memos; an alarm clock; a stopwatch; calendars; appointment scheduling; current times and temperatures in different cities around the world; a calculator; video games; text messaging (or SMS); a camera with photo albums; Internet service; email; infrared; Bluetooth; an MP3 player; storage for downloaded music, movies, or podcasts; geographic positioning system (GPS) features; radio broadcasts; maps; stock market quotes; weather; reminders; Skype or FaceTime; and Google Maps, to name a few "basic" applications. As of 2019, more than 2 million apps are available for download offering an array of information, accessories, and services. The completely portable cell phone with its keypad or touchscreen did not exist for the general public until 1973. Further, newer generations of cell phones will include unimaginable new applications, accessories, and services.

Consider another example. More than likely, your great-grandparents wrote letters on manual typewriters (or by hand). Your grandparents wrote letters on electric typewriters, whereas your parents started writing letters on electric typewriters and then had to change to computers. Today, you often communicate with family members and friends by email, text messaging, Facebook, Facebook Messenger, WhatsApp, Instagram, Twitter, Google+, Skype, and Dropbox. Although many of the electronic devices in your life may seem normal, a visit to a science and technology museum can offer many surprises and, more than likely, an appreciation for how things were and how much they have changed.

These examples illustrate how technology is in a continuous state of development and how it affects our day-to-day lives. In a sense, the technology we use today will be replaced tomorrow, as newer and more advanced forms of innovation give birth to new technology and software.

What does this have to do with drug use and abuse? Just as electronics continually evolve, drugs follow similar paths of evolution. Today, thousands of new drugs are available that are used either legally or illegally. These drugs are used for medicinal purposes, recreational purposes, and to achieve effects that do not include maintaining health. Some people in society use drugs to cope with pressures emanating from social change. Others use and eventually abuse drugs to cope with, delay, or postpone reality. For some, illicit drug use becomes a primary method for instant recreation, a way to avoid anxieties, or a substitute to fulfill human desires and pleasures.

Despite the extensive amount of available information regarding the dangers of drug use and an increasing number of laws prohibiting nonmedical drug use, many people today continue to abuse legal and illegal types of drugs.

[1]Landline phones continue to disappear from U.S. households; approximately 42.8% of American homes had landline phones as of December 2017 (Burke, 2019).

Drug Use

Anyone can become dependent on and addicted to a drug. The desire to use a drug before drug dependence and addiction occur is both seductive and indiscriminate of its users. Most people do not realize that drug use causes at least four major simultaneous changes:

1. The social psychological basis of an attraction to a drug can be explained as feeling rewarded or satisfied because social pressures can appear to have become postponed, momentarily rectified, or neutralized and perceived as nonproblematic.
2. Pharmacologically, the nonmedical use of most drugs alters body chemistry largely by interfering with homeostatic functioning. Drugs *enhance, depress, accelerate, or distort* the perception of reality.
3. Using a drug may satisfy an inborn or genetically programmed need or desire. Psychoactive drugs interfere with the way neurons send, receive, and process signals via neurotransmitters.

Many argue that our "reality" would become perilous and unpredictable if people were legally free to dabble in their drugs of choice. Many do not realize, however, that even legal drugs can be used to alter our perception of reality, can become severely addicting, and can destroy our social relationships with loved ones. Before delving into more specific information, we begin by posing key questions related to drug use that will be discussed in this chapter:

- What constitutes a drug?
- What drugs are commonly abused?
- What are designer drugs?
- How widespread is drug abuse?
- What is the extent and frequency of drug use in our society?
- What are the current statistics and trends of drug use?
- What types of drug users exist?
- How does the media influence drug use?
- What attracts people to drug use?
- When does drug use lead to drug dependence?
- When does the final stage of drug addiction occur?
- What are the costs of drug addiction to society?
- What is gained by learning about the complexity of drug use and abuse?

Dimensions of Drug Use

To determine the perception of drug use in our country, we asked several of the many people we interviewed for this text, "What do you think of the extent and the amount of drug use in our society?" The following are four of the more typical responses:

> I think it is a huge problem, especially when you think about the fact that there are so many people doing drugs. Even in my own family, my sister's kids have had drug problems. My niece became addicted to cocaine, nearly died one night from overdosing, had to leave college for a year and go into rehab. I cannot emphasize enough how this was one of the most beautiful (physically and mentally sharp) and polite nieces I ever had. The rest of the family had no idea why she left school last year. Then, just last week, my sister tearfully announced during a Christmas gathering that Cindee was heavily into drugs while attending her second year of college. We were all shocked by this information. Now, just think how many other kids are addicted to such junk while the people who really care and love them do not have a clue. If the kids are having to deal with this, just stop and think how many other people in other jobs and professions are battling or have caved into their drugs of choice.
>
> How many workers are there on a daily basis doing jobs that require safety and are "high" on drugs? This is a scary thought. Just think of a surgeon on drugs, or an airline pilot. Yes, we have big monster problems with controlling drug use. *(From Venturelli's research files, female dietician in Chicago, age 43, February 9, 2003)*

A second response to the same question:

> I use drugs, mainly weed and alcohol, and at least once a month I have a night of enjoying coke with several friends. As long as I am not a burden on my family, I think drug use is a personal choice. Locking up people for their drug use is a violation of my rights as a human being. For many years now, our government has not been able to stop recreational drug use, this is despite the millions that have been arrested, and countless numbers of other drug users incarcerated. What's the point of all this? If after so many years of trying to enforce drug laws has met with failure, we need to take a long hard look at the small percentage of

people like me who are fully employed, have families, pay our taxes regularly and outside of drug use, are fully functioning adults. The funny thing is that the two drugs [referring to alcohol and tobacco] that are legalized are far worse or at least as debilitating as the drugs that are legally prohibitive [sic]. Drug use is a personal choice and unless you are causing problems for other people, it should remain a personal choice. If I am using drugs on a particular night at home either by myself or with friends and we are not outside causing problems, we should not be in violation of any drug law or laws. Substances to get high have been around for hundreds and probably thousands of years, these substances that some of us like should not be any concern to others. Even my pet cat loves his catnip and appears to get a high from it; should I prohibit this little pleasure? I let him occasionally have it even if, for example, my neighbor thinks catnip is affecting the normal nature of my cat. How about if I get a rise from snorting or smoking one of the herbs in my kitchen cabinet? Whose business is it if I like to use herbs in this manner? Maybe we should also outlaw catnip and herbs? Again, drug use for whatever purpose is a personal decision and all the laws against the use of drugs are not going to stop me from using drugs. *(From Venturelli's research files, male residing in a Midwestern town, age 27, May 6, 2010)*

A third response to the same question:

My drug use? Whose business is it anyway? As long as I don't affect your life when I do drugs, what business is it but my own? We come into the world alone and leave this world alone. I don't bother anyone else about whether or not so and so uses drugs, unless of course, their drug use puts me in jeopardy (like a bus driver or pilot high on drugs). On certain days when things are slow, I even get a little high on cocaine while trading stocks. These are the same clients who I have had for years and who really trust my advice. Ask my clients whether they are happy with my investment advice. I handle accounts with millions of dollars for corporations and even the board of education! Never was my judgment impaired or adversely affected because of too much coke. In fact, I know that I work even better under a little buzz. Now, I know this stuff has the potential to become addictive, but I don't let it. I know how to use it and when to lay off for a few weeks. *(From Venturelli's research files, male investment broker working in a major metropolitan city in California, age 48, June 2, 2000)*

A fourth response to the same question, from an interviewee who recently moved from Indiana to Colorado:

Well, things are changing regarding drug use purely for recreational purposes. I am referring to marijuana of course. In Colorado, marijuana is now legalized. I also think this is the way it should be not only in Colorado but also throughout the country. I can now actually see how state after state will eventually legalize marijuana. There will be holdout states, like usually deep southern states, but it's just a matter of time. I think it was Oakland, California, where by taxing the sale of marijuana, the city was collecting a nice amount of tax revenues from marijuana sales. If I am not in error, it was reported as millions of dollars they were collecting. Now, don't you think this alone will attract other cities and states to legalize and tax this drug in order to gain tax revenues, especially when state and city tax revenues are in dire need to increase revenue coming in? It won't be the spread of liberalism that will legalize marijuana; it will be common business sense that will get rid of the ridiculous laws outlawing marijuana use and sales. I have always smoked pot and nothing has ever stopped me. On top of this add the millions who feel the same way. If you don't want to use this drug to relax like others may use alcohol that is fine but leave the users alone and stop making law violators! It is still illegal and you [referring to this interviewer] and I know that all these laws and the millions upon millions spent on trying to stop marijuana drug users have not worked, so why keep this up? Again, why prohibit something that given its history cannot be stopped? *(From Venturelli's research files, male attorney, currently practicing law and residing in the state of Colorado, age 33, January 2, 2013)*

These four interviews reflect vastly contrasting views and attitudes about drug use. The first interview shows the most contrast from the second, third, and fourth interviews. The second, third, and fourth interviews show a similarity of views about drug use, largely from an insider's (user's) perspective, which indicate a strong determination and belief that drug use should

not be legally controlled and should be left to the discretion of users. Although much about these viewpoints can certainly be debated, an interesting finding is that such vastly different views about drug use are not only evident, but also, more importantly, often divide drug users and nonusers. From a more social psychological standpoint, drug users or sympathizers of drug use are often considered **insiders** with regard to their drug use, whereas nonusers or those who are against drug use are **outsiders**. These two classifications result in decidedly different sets of values and attitudes about drug usage. Such great differences of opinion and views about drugs and drug use often result from the following sources: (1) prior socialization experiences, such as family upbringing, relations with siblings, and types of peer-group associations; (2) the amount of exposure to drug use and drug users; (3) the age of initial exposure to drug use; and (4) whether an attitude change has occurred regarding the acceptance or rejection of using drugs. Keep in mind that this text views the following four principal factors as affecting how a drug user experiences a drug:

1. *Biological, genetic, and pharmacological factors.* Substance abuse and addiction involve biological and genetic factors. The pharmacology of drug use focuses on how the ingredients of a particular drug affect the body and the nervous system and, in turn, a person's experience with a particular drug.
2. *Cultural factors.* Society's views of drug use, as determined by custom and tradition, affect our initial approach to and use of a particular drug.
3. *Social factors.* The motivation for taking a particular drug is affected by needs such as diminishing physical pain; curing an illness; providing relaxation; relieving stress or anxiety; trying to escape reality; self-medicating; heightening awareness; wanting to distort and change visual, auditory, or sensory inputs; or strengthening confidence. Included in the category of social factors is the belief that attitudes about drug use develop from the values and attitudes of other drug users; the norms in their communities, subcultures, peer groups, and families; and the drug user's personal experiences with using drugs. (These are also known as *influencing social factors.*)
4. *Contextual factors.* Specific contexts define and determine personal dispositions toward drug use as demonstrated by moods and attitudes about such activity. Specifically, these factors encompass the drug-taking social behavior that develops from the physical surroundings where the drug is used. For example, drug use may be perceived as more acceptable at fraternity parties, while socializing with drug-using friends, outdoors in a secluded area with other drug users, in private homes, secretly at work, or at music concerts.

Paying attention to the cultural, social, and contextual factors of drug use leads us to explore the sociology and psychology of drug use. Equally important are the biological, genetic, and pharmacological factors and consequences that directly focus on why and how drugs may be appealing and how they affect the body—primarily the central nervous system and brain functions.

Although substances that affect both mind and body functioning are commonly called *drugs*, researchers in the field of drug or substance abuse use a more precise term: **psychoactive drugs (substances)**. Why the preference for using this term as opposed to *drugs*? Because the term *psychoactive drugs* is more precise regarding *how* drugs affect the body. This term focuses on how drugs affect the **central nervous system (CNS)**, the part of the nervous system composed of the spinal cord and brain that is responsible for integrating sensory information and responding accordingly. In particular, the term encompasses how psychoactive drugs alter mood, consciousness, thought processes, perception, or behavior. Psychoactive drugs can be used to

KEY TERMS

insiders
people on the inside; those who approve of or use drugs or both

outsiders
people on the outside; those who do not approve of or do not use drugs

psychoactive drugs (substances)
drug compounds (substances) that affect the central nervous system and alter consciousness or perceptions

central nervous system (CNS)
part of the nervous system composed of the spinal cord and brain that is responsible for integrating sensory information and responding accordingly

treat physical, psychological, or mental illness. In addition, with continued use, our bodies can tolerate increasingly larger doses of drugs, often resulting in the need for progressively greater amounts to achieve the same level of effect. For many substances, a user is at risk of moving from occasional to regular use or from moderate to heavy use, ultimately culminating in chronic use. A chronic user may then risk **addiction** a mostly psychological attachment defined as "a complex condition, a brain disease that is manifested by compulsive substance use despite harmful consequences . . ." (APA, 2019) and experiences **withdrawal symptoms** that are psychological or physical in nature whenever the drug is not consumed.

Generally speaking, any substance that modifies the nervous system and state of consciousness is a **drug**. Such modifications include one or more of the following: enhancement, inhibition, or distortion of the body that affects patterns of behavior and social functioning. Psychoactive drugs are classified as either **licit** (legal) or **illicit** (illegal). (See **Table 1.1** for a sample list of slang terms used by drug users.) For example, coffee, tea, cocoa, alcohol, tobacco, and **over-the-counter (OTC)** drugs are licit. When licit drugs are used in moderation, they often go unnoticed and are often socially acceptable. Marijuana, cocaine, crack, and all of the hallucinogenic types of drugs are examples of illicit drugs. With the exception of marijuana—which some states allow for medical use and small amounts for personal use—federal law continues to prohibit the possession and use of all of these drugs.

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Examples of illicit drugs that can become costly once drug dependence occurs.

Researchers have made some interesting findings about legal and illegal drug use:

- The use of legal substances such as alcohol and tobacco is much more common than the use of illegal drugs such as marijuana, cocaine, heroin, and hallucinogens (psychedelics). Other legal drugs such as depressants and stimulants, although less popular than alcohol and tobacco, are still more widely used than heroin and LSD.
- The popular use of licit drugs, particularly alcohol and tobacco, has caused far more deaths, sickness, violent crime, economic loss, and other social problems than the combined use of all illicit drugs. (See **Figure 1.1** for an illustrated comparison.)

Cigarette smoking and exposure to tobacco smoke led to at least 480,000 premature deaths annually in the United States (includes deaths from secondhand smoke: 278,544 deaths annually among men and 201,773 deaths annually among women). More than 88,000 U.S. deaths are caused by excessive alcohol consumption each year (direct and indirect causes of death include drunk driving, cirrhosis of the liver, falls, cancer, and stroke). The popular use of licit drugs, particularly alcohol and tobacco, has caused far more death, sickness, violent crime, economic loss, and other social problems than the combined use of all illicit drugs. The annual overdose death rate for the 12-month period

KEY TERMS

addiction
generally refers to the psychological attachment to a drug; addiction to "harder" drugs such as heroin results in both psychological and physical attachment to the chemical properties of the drug, with the resulting satisfaction (reward) derived from using the drug in question

withdrawal symptoms
psychological and physical symptoms that result when a drug is absent from the body; physical symptoms are generally present in cases of drug dependence to more addictive drugs such as heroin; physical and psychological symptoms of withdrawal include perspiration, nausea, boredom, anxiety, and muscle spasms

drug(s)
any substance that modifies (either by enhancing, inhibiting, or distorting) mind or body functioning

licit drugs
legalized drugs such as coffee, alcohol, and tobacco

illicit drugs
illegal drugs such as marijuana, cocaine, and LSD

over-the-counter (OTC)
legalized drugs sold without a prescription

TABLE 1.1 A Sampling of 73,000 Slang Terms Relating to Drugs, Drug Use, and the Drug Trade

Slang Term	What It Means	Slang Term	What It Means
24-7	Crack cocaine	Blunt	Marijuana or cocaine inside a cigar
80	OxyContin pill	Boost and shoot	Steal to support a drug habit
714s	Methaqualone	Brain ticklers	Amphetamines
3750	Marijuana and crack rolled in a joint	Brown bombers	LSD
Abolic	Veterinary steroids	Brown sugar	Heroin
A-bomb	Marijuana cigarette with heroin or opium	Buddha	Potent marijuana spiked with opium
AC/DC	Codeine cough syrup	Bull dog	Heroin
Acid, acid cube	LSD, sugar cube with LSD	Bundle	Heroin
Acid freak	Heavy user of LSD	Ditch weed	Inferior quality marijuana
Adam	Methylenedioxymethamphetamine (MDMA)	Dr. Feelgood	Heroin
Air blast	Inhalants	Easy lay	Gamma hydroxybutyrate (GHB)
All star	User of multiple drugs	Fantasy	GHB
Amped	High on amphetamines	Flower flipping	Ecstasy (MDMA) mixed with mushrooms
Angel dust	PCP	Forget-me-drug	Rohypnol
Author	Doctor who writes illegal prescriptions	Fries	Crack cocaine
Baby habit	Occasional use of drugs	Garbage rock	Crack cocaine
Balloon	Heroin supplier; a penny balloon that contains narcotics	Hit the hay	Smoke weed
Bam	Amphetamine; depressants	Hippie crack	Inhalants
Barbies	Depressants	Hot ice	Smokable methamphetamine
Battery acid	LSD	Huff, huffing	Inhalants, to sniff an inhalant
Batu	Smokable methamphetamine	Ice cream habit	Occasional use of a drug
Beam me up, Scottie	Crack dipped in PCP	Idiot pills	Depressants
Beanies	Methamphetamine	Kiddie dope	Prescription drugs
Beast	Heroin, LSD	Lemonade	Heroin; poor quality drugs
Belladonna	PCP	Lunch money drug	Rohypnol
Bender	Drug party	Magic mushroom	Psilocybin or psilocin
Biker's coffee	Methamphetamine and coffee	Monkey dust	PCP
Bin Laden	Heroin (after 9/11)	Moon gas	Inhalants
Black beauties	Amphetamines, depressants	Mother's little helper	Depressants
Blasted	Under the influence of drugs	Nose candy	Cocaine

(*continues*)

TABLE 1.1 A Sampling of 73,000 Slang Terms Relating to Drugs, Drug Use, and the Drug Trade (*continued*)

Slang Term	What It Means	Slang Term	What It Means
Blow your mind	Getting high on hallucinogens	Paper boy	Heroin peddler
Pepsi habit	Occasional use of drugs	Tornado	Crack cocaine
Pony	Crack cocaine	Totally spent	Hangover after MDMA
Ringer	Good hit of crack, to hear bells	Water-water	Marijuana cigarettes dipped in embalming fluid or laced with PCP
Shot	To inject a drug, an amount of coke	West Coast	Ritalin (ADHD drug)
Soda	Injectable cocaine	Working man's cocaine	Methamphetamine
Special "K"	Ketamine	Zig Zag man	Marijuana rolling papers
Strawberry	LSD; female who trades sex for crack or money to buy crack	Zombie	PCP; heavy user of drugs
The devil	Crack cocaine	Zoom	Marijuana laced with PCP

Reproduced from Office of National Drug Control Policy (ONDCP). (2016). *Street terms: Drugs and the drug trade*. Washington, DC: Author. Retrieved from http://www.streetlightpublications.net/misc/ondcp.htm

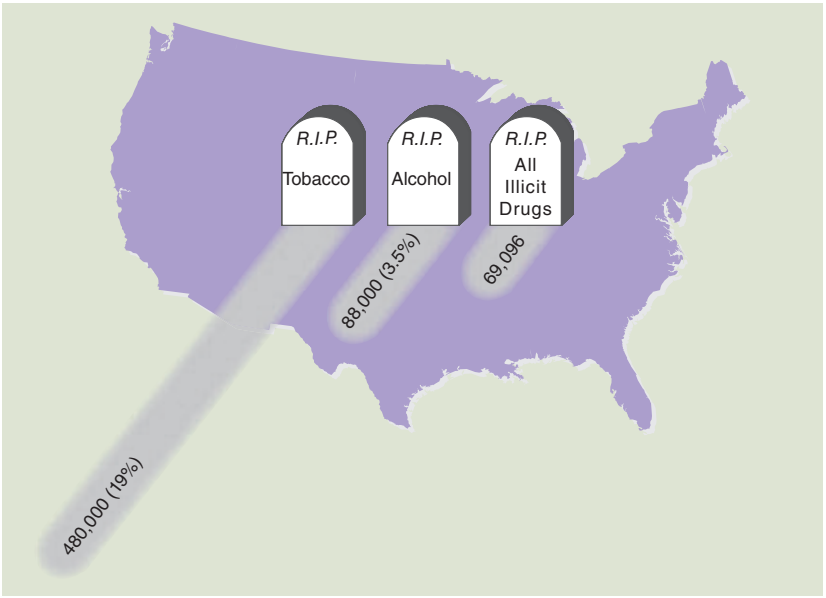


FIGURE 1.1 Cigarette smoking and exposure to tobacco smoke led to at least 480,000 premature deaths annually in the United States (includes deaths from secondhand smoke (278,544 deaths annually among men and 201,773 deaths annually among women). More than 88,000 U.S. deaths are caused by excessive alcohol consumption each year (direct and indirect causes of death include drunk driving, cirrhosis of the liver, falls, cancer, and stroke). The popular use of licit drugs, particularly alcohol and tobacco, has caused far more deaths, sickness, violent crimes, economic loss, and other social problems than the combined use of all illicit drugs. The annual overdose death rate for the 12-month period ending November 2018 was 69,096, which was a drop from 72,300 in 2017. "The drug overdose death numbers include deaths due to natural and semi-synthetic opioids, synthetic opioids other than methadone (fentanyl and its analogs), methadone, methamphetamines and other stimulants, cocaine, and benzodiazepines" (Cato Institute, 2019). Drug licit and illicit overdose deaths rose from 16,849 in 1999 to 69,096, in 2018. "[T]he sharpest increase occurred among deaths related to fentanyl and fentanyl analogs (other synthetic narcotics) with more than 28,400 overdose deaths" (NIDA, 2019a).

Data from Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004, March 10). Actual causes of death in the United States, 2000. *Journal of the American Medical Association (JAMA), 291*, 1238–1245; Centers for Disease Control and Prevention (CDC). (2019, November 15). Fast facts. Atlanta, GA: U.S. Department of Health and Human Services. Retrieved from https://www.cdc.gov/tobacco/data_statistics/fact_sheets/fast_facts/index.htm; Centers for Disease Control and Prevention (CDC). (2018a, January 3). Fact sheets—Alcohol use and your health. Atlanta, GA: U.S. Department of Health and Human Services. Retrieved from https://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm; Singer, J. A. (2019, June 26). CDC provisional drug death numbers show slight improvement. Credit harm reduction. Washington, DC: CATO Institute. Retrieved from https://www.cato.org/blog/cdc-provisional-drug-death-numbers-show-slight-improvement-credit-harm-reduction; National Institute on Drug Abuse (NIDA). (2019a). Overdose death rates. Bethesda, MD: National Institutes of Health. Retrieved from https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates

ending November 2018 was 69,096, which was a drop from 72,300 in 2017. "The drug overdose death numbers include deaths due to natural and semi-synthetic opioids, synthetic opioids other than methadone (fentanyl and its analogs), methadone, methamphetamines and other stimulants, cocaine, and benzodiazepines" (Singer, 2019). Licit and illicit drug overdose deaths rose from 16,849 in 1999 to 69,096 in 2018. "[T]he sharpest increase occurred among deaths related to fentanyl and fentanyl analogs (other synthetic narcotics) with more than 28,400 overdose deaths" (NIDA, 2019a). (Data from CDC, 2018a, 2019; Mokdad, Marks, Stroup, & Gerberding, 2004; NIDA, 2019a; Singer, 2019.)

Societal reaction to various drugs changes with time and place. Today, opium is an illegal drug and widely condemned as a *pan-pathogen* (a cause of all ills). In the 18th and 19th centuries, however, it was a legal drug and was popularly praised as a panacea (a cure for all ills). Alcohol use was widespread in the United States in the early 1800s, became illegal during the 1920s, was legalized a second time in the 1930s, and has been widely used ever since. Cigarette smoking is legal in all countries today. In the 17th century, it was illegal in most countries, and smokers were sometimes harshly punished. For example, in Russia, smokers could lose their noses; in Hindustan (India), they could lose their lips; and in China, they could lose their heads (Thio, 1983, 1995, 2000). Today, new emphasis in the United States on the public health hazards from cigarettes again is leading some people to consider new measures to restrict or even outlaw tobacco smoking.

Table 1.2 introduces some of the terminology you will encounter throughout this text. It is important that you understand how the definitions vary.

TABLE 1.2 Commonly Used Terms

Term	Description
Gateway drugs	The word *gateway* suggests a path or entryway leading to an entrance. Gateway is a theory that the early use of alcohol, tobacco products, and marijuana (the most heavily used illicit type of drug) leads to the use of more powerfully addictive drugs such as cocaine, heroin, and highly addictive prescription medicines.
Medicines	Compounds generally prescribed by a physician that treat, prevent, or alleviate the symptoms of disease. (These can also include over-the-counter [OTC] drugs purchased at pharmacies.)
Prescription medicines	Drugs that are prescribed by a physician. Common examples include antibiotics, antidepressants, and drugs prescribed to relieve pain, induce stimulation, or induce relaxation. These drugs are taken under a physician's recommendation because they are more potent than OTC drugs. In the United States, on a yearly basis, physicians write approximately 4.0 billion prescriptions (Henry J. Kaiser Family Foundation, 2015), with sales totaling $374 billion in 2015 ("U.S. Prescription Drug Spending," 2015).
Over-the-counter (OTC)	OTC drugs can be purchased at will without seeking medical advice or a prescription. Examples include aspirin, laxatives, diet pills, cough suppressants, and sore throat medicines. Approximately 1,000 active ingredients are used in the more than 100,000 OTC products available in the marketplace today (Consumer Healthcare Products Association [CHPA], 2012), and it is estimated that there are more than 300,000 marketed OTC drug products (U.S. Food and Drug Administration 2015). In 2010, $23 billion were spent in the United States on OTC medicines* (CHPA, 2012).
Drug misuse	The unintentional or inappropriate use of prescribed or OTC drugs. Misuse includes but is not limited to (l) taking more drugs than prescribed; (2) using OTC or psychoactive drugs in excess without medical supervision; (3) mixing drugs with alcohol or other drugs, often to accentuate euphoric effects or simply not caring about the effects of mixing drugs; (4) using old medicines to self-treat new symptoms of an illness or ailment; (5) discontinuing certain prescribed drugs at will or against a physician's recommendation; and (6) administering prescription drugs to family members or friends without medical approval and supervision.
Drug abuse	Also known as *chemical or substance abuse*. The willful misuse of either licit or illicit drugs for recreation, perceived necessity, or convenience. Drug abuse differs from drug use in that drug use is taking or using drugs, whereas drug abuse is a more intense and often willful misuse of drugs, often to the point of becoming addicted.

(*continues*)

TABLE 1.2 Commonly Used Terms (*continued*)

Term	Description
Drug addiction	Drug addiction involves noncasual or nonrecreational drug use. A frequent symptom is intense psychological preoccupation with obtaining and consuming drugs. Most often psychological and—in some cases, depending on the drug—physiological symptoms of withdrawal are manifested when the craving for the drug is not satisfied. Today, more emphasis is placed on the psychological craving (mental attachment) to the drug than on the more physiologically based withdrawal symptoms of addiction.

*This amount excludes OTC sales by Walmart and does not include vitamins, minerals, and nutritional supplements.

Data from Fischer, M. A., Stedman, M. R., Lii, J., Vogeli, C., Shrank, W. H., Brookhart, M. A., & Weissman, J. S. (2010 April). Primary medication non-adherence: Analysis of 195,930 electronic prescriptions. *Journal of General Internal Medicine, 25*, 284–290; The Henry J. Kaiser Family Foundation. (2010). *Prescription drug trends*. Retrieved from http://www.kff.org/rxdrugs/3057.cfm. Accessed January 12, 2013; Consumer Healthcare Products Association (CHPA). (2019). *OTC retail sales—1964–2011*. Washington, DC: Author; U.S. Food and Drug Administration. (2015). *Drug applications for over-the-counter (OTC) drugs*. Retrieved from http://www.fda.gov/drugs/developmentapprovalprocess/howdrugsaredevelopedandapproved/approvalapplications/over-the-counterdrugs/default.htm; Consumer Healthcare Products Association (CHPA). (2012). *The value of OTC medicine to the United States*. Washington, DC: Booz & Co. Retrieved from http://www.yourhealthathand.org/images/uploads/The_Value_of_OTC_Medicine_to_the_United_States_BoozCo.pdf

Major Types of Commonly Abused Drugs

The six types of major drugs in use are (l) prescription drugs, (2) over-the-counter drugs, (3) recreational drugs (e.g., coffee, tea, alcohol, tobacco, and chocolate), (4) illicit drugs, (5) herbal preparations (generally derived from plants), and (6) commercial drugs (paints, glues, pesticides, and household cleaning products).

To begin, we now briefly examine the major drugs of use and often abuse. The drugs examined next are prescription drugs, performance-enhancing drugs, stimulants, bath salts, hallucinogens (psychedelics) and other similar compounds, depressants, alcohol, nicotine, cannabis (marijuana and hashish), synthetic cannabis (Spice and K2), anabolic steroids, inhalants and organic solvents, narcotics and opiates, and designer drugs, synthetic drugs, and synthetic opioids. A brief overview of each follows.

Prescription and Performance-Enhancing Drugs

The term *nonmedical use* of prescription drugs also refers to these categories of misuse. The three classes of medication most commonly misused are:

1. *opioids*, which are usually prescribed to treat pain;
2. *central nervous system* (CNS) *depressants*, which include tranquilizers, sedatives, and hypnotics, and are used to treat anxiety and sleep disorders; and
3. *stimulants*, which are most often prescribed to treat attention-deficit hyperactivity disorder (ADHD)

KEY TERM

psychotherapeutic drugs
drugs that are used to treat mental disorders such as depression, schizophrenia, and manic–depressive disorders

Many national studies and published reports indicate that the intentional abuse of prescription drugs such as pain relievers, tranquilizers, stimulants, and sedatives to get high is a growing concern—particularly among teens—in the United States. **Psychotherapeutic drugs** are drugs that are used to treat mental disorders such as depression, schizophrenia, and manic–depressive disorders. These drugs warrant special attention given that they now make up a significantly larger part of the overall U.S. drug problem than they did 10 to 15 years ago. In part this is because the use increased for many prescription drugs over that period and because the use of many street drugs has declined substantially since the middle to late 1990s. It seems likely that young people are less concerned about the dangers of using these prescription drugs outside of a medical regimen because they are widely used for legitimate purposes. (Indeed, the low levels of perceived risk for sedatives and amphetamines observed among 12th graders illustrate this point.) Also, prescription psychotherapeutic drugs are now being advertised directly to the consumer, which implies that they are both widely used and safe to use (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2016; SAMHSA, 2019c).

In the United States, young people and adults frequently abuse prescription drugs; the only illicit drug that is abused more frequently is marijuana (SAMHSA. 2019a). In 2017, "an estimated 18 million people (more than 6% of those aged 12 and older) have misused prescription drugs such as prescription opioids, CNS depressants, and stimulants at least once in the past year" (NIDA, 2018a).

Misuse of prescription drugs is highest among young adults ages 18 to 25, with 14.4% reporting nonmedical use in the past year. Among youth ages 12 to 17, 4.9% reported past-year nonmedical use of prescription medications (Miech et al., 2017). After alcohol, marijuana, and tobacco, prescription drugs (taken nonmedically) are among the most commonly used drugs by 12th graders. NIDA's *Monitoring the Future* survey of substance use and attitudes in teens found that about 6% of high school seniors reported past-year nonmedical use of the prescription stimulant Adderall® in 2017, and 2% reported misusing the opioid pain reliever Vicodin (NIDA, 2018a). Regarding older adults, "more than 80% of older patients (ages 57 to 85 years) use at least one prescription medication on a daily basis, with more than 50% taking more than five medications or supplements daily" (NIDA, 2018a).

Three categories of prescription drugs that are currently abused are narcotics, depressants, and stimulants. Narcotics (e.g., OxyContin, Vicodin, Percocet) include analgesics or **opioids** that are generally prescribed for physical pain. Abuse occurs when they are used nonmedically because of their euphoric and numbing effects. Depressants (e.g., Xanax, Valium, Librium) are generally used to treat anxiety and sleep disorders. These drugs are abused because of their sedating properties. Stimulants (e.g., Ritalin, Dexedrine, Meridia) are used to treat attention-deficit disorder (ADD), attention-deficit hyperactivity disorder (ADHD), and asthma. These drugs are abused because of their euphoric effects and energizing potential.

The two drugs in the stimulants category most often abused are Ritalin (methylphenidate hydrochloride) and Adderall (amphetamine). These prescription drugs are legitimately prescribed for ADHD, ADD, and narcolepsy (a sleep disorder) (Center for Substance Abuse Research [CESAR], 2003). When used nonmedically, they are taken orally as tablets or the tablets are crushed into a powder and snorted (a far more popular method). Students often illegally purchase these tablets for $5 each from other students who have a legal prescription for the medication.

> I feel like Dr. Pill. All these brothers [fraternity brothers] are always looking for me at parties so that I can sell them a few tabs. What the heck, I make extra money selling Ritalin, enough to buy essentials like beer and cigarettes. *(From Venturelli's research files, male undergraduate student at a Midwestern university, age 20, December 9, 2004)*

And,

> Funny how when I go back to the frat house during homecoming there are other undergrads who have taken over my business and continue to sell their prescribed Ritalin mostly for partying. *(A second interview with the same former student, age 26, now employed in real estate, October 2, 2010)*

These drugs often are used in conjunction with alcohol or marijuana to enhance the high or to stay awake to increase comprehension and remain focused while reading or studying for an exam (CESAR, 2003). Both prescription drugs (Ritalin and Adderall) are readily available and can be easily obtained by teenagers, who may abuse these drugs to experience a variety of desired effects. Increasingly, younger adolescents are obtaining prescription drugs from classmates, friends, and family members or are stealing the drugs from school medicine dispensaries and from other people who have legitimate prescriptions.

Ritalin, Adderall, and other stimulant abusers tend to be late middle school, high school, and college students. Other findings regarding teen abuse of stimulants Ritalin and Adderall include the following (Partnership for Drug-Free Kids, 2016):

- One in eight teens (about 2.7 million) report having misused or abused Ritalin or Adderall at least once in their lifetime.
- Around 1.9 million teens (9%) report having misused or abused Ritalin or Adderall in the past year.
- One in four teens (26%) believe that prescription drugs can be used as a study aid.
- Almost one-third of parents (29%) say they believe that ADHD medication can improve a child's academic or testing performance, even if the teen does not have ADHD.
- One in six parents (16%) believe that using prescription drugs to get high is safer than using street drugs.

KEY TERM

opioids
drugs derived from opium

- More than half of teens (56%) indicate that it is easy to get prescription drugs from their parents' medicine cabinet. In fact, about half of parents (49%) say anyone can access their medicine cabinet.

In addition, the Partnership for Drug-Free Kids and MetLife Foundation (2013) note that Hispanic and African American teens are more likely to report misusing or abusing prescription drugs compared to their white counterparts, with 27% of Hispanics, 29% of African Americans, and 20% of Caucasians reporting use.

With regard to college students using Adderall, the findings include the following (Muir Wood, 2016):

- Full-time college students were twice as likely as non–full-time college students to abuse Adderall.
- About 6.4% of college students admitted to unauthorized Adderall use in 2006–2007.
- College students who abused Adderall were three times as likely to abuse marijuana, eight times as likely to abuse prescription tranquilizers, and five times as likely to abuse prescription painkillers.
- Cocaine use is more common among college students who use Adderall, and students who use both drugs face an increased risk of heart attack, heart problems, and stroke.

■ Stimulants

Some stimulants can be considered to be **gateway drugs** (see definition in Table 1.2); these substances act on the CNS by increasing alertness, excitation, euphoria, pulse rate, and blood pressure. Insomnia and loss of appetite are common outcomes. The user initially experiences pleasant effects, such as a sense of increased energy and a state of euphoria or being "high." In addition, users feel restless and talkative and have trouble sleeping. High doses used over the long term can produce personality changes. Some of the psychological risks associated with chronic stimulant use include violent, erratic, or paranoid behavior.

KEY TERMS

gateway drugs
alcohol, tobacco, and marijuana—types of drugs that when used excessively may lead to using other and more addictive drugs such as cocaine, heroin, or crack

Drug Enforcement Administration (DEA)
the principal federal agency responsible for enforcing U.S. drug laws

Other effects can include confusion, anxiety, and depression and loss of interest in sex or food. *Major stimulants* include amphetamines, cocaine and crack, methamphetamine (meth), and methylphenidate (Ritalin). *Minor stimulants* include, cocoa, theophylline, theobromine, sugar, caffeine, and nicotine (the most addictive minor stimulant).

■ Synthetic Cathinones (Bath Salts)

Synthetic cathinones, also commonly known as *bath salts*, are human-made stimulants chemically related to cathinone, a substance found in the khat plant. Khat is a shrub grown in East Africa and southern Arabia, where some people chew its leaves for their mild stimulant effects. Human-made versions of cathinone can be much stronger than the natural product and, in some cases, extremely dangerous (NIDA, 2018b).

Synthetic cathinones are marketed as cheap substitutes for other stimulants such as methamphetamine and cocaine, and methylenedioxymethamphetamine (MDMA), which is sold as Molly, often contain synthetic cathinones instead (NIDA, 2018b).

The usual method of taking this drug is sniffing or snorting, but it can also be taken orally, smoked, or mixed with a solution and then injected into a vein. According to Dr. Mark Ryan, director of the Louisiana Poison Center, bath salts are "the worst drug" he has seen in his 20 years there, noting that "with LSD, you might see pink elephants, but with this drug, you see demons, aliens, extreme paranoia, heart attacks, and superhuman strength like Superman. . . . If you had a reaction, it was a bad reaction" (Vargas-Cooper, 2012, p. 60). Other reactions include "very severe paranoia, suicidal thoughts, agitation, combative/violent behavior, confusion, hallucination/psychosis, increased heart rate, hypertension, chest pain, death or serious injury. The speed of onset is 15 minutes, while the length of the high from these drugs is 4–6 hours" (Partnership at DrugFree.Org, 2013). In October 2011, these synthetic stimulants were listed as Schedule I substances under the Controlled Substances Act. The **Drug Enforcement Administration (DEA)** classifies illicit drugs under Schedules I through V, largely depending on their abuse potential. Synthetic stimulants are classified as Schedule I drugs, meaning that they have a high potential for abuse.

■ Hallucinogens, Psychedelics, and Other Similar Drugs

Whether synthetic or grown naturally, hallucinogens and psychedelic drugs produce intense alterations of perceptions, thoughts, and feelings. They

Courtesy of DEA.

Courtesy of DEA.

Packets of bath salts sold in head shops.

most certainly influence the complex inner workings of the human mind, causing users to refer to these drugs as *psychedelics* (because they cause hallucinations or distortion of reality and thinking). In addition to amplifying states of mind, hallucinogens induce a reality that is reported to be qualitatively different from that of ordinary consciousness. For example, while the user is under their influence, these drugs can affect the senses of taste, smell, hearing, and vision. Tolerance to hallucinogens builds rapidly, which means that increasing amounts of this drug are needed for similar effects. Hallucinogens include LSD, mescaline, **MDMA** (Ecstasy), phencyclidine (PCP), psilocybin or "magic mushrooms," ketamine, and the more potent (hybrid) varieties of marijuana, hashish, and opium that are smoked.

■ Depressants

These drugs depress the CNS. If taken in high enough quantities, they produce insensibility or stupor. Depressants are also taken for some of the same reasons as hallucinogens, such as to relieve boredom, stress, or anxiety. In addition, the effects of both opioids (drugs that are derived from opium) and morphine derivatives appeal to many people who are struggling with emotional problems and looking for physical and emotional relief, and in some cases to induce sleep. Depressants include alcohol (ethanol), opiates (such as heroin and morphine), sedatives, barbiturates, benzodiazepines (such as diazepam [Valium]), and methaqualone (Quaalude).

ALCOHOL

Known as a gateway drug, **ethanol** is a colorless, volatile, and pungent liquid produced through the fermentation of grains, berries, or other fruits and vegetables. Alcohol is a depressant that mainly affects the CNS. Excessive amounts of alcohol often cause a progressive loss of inhibitions, flushing and dizziness, loss of coordination, impaired motor skills, blurred vision, slurred speech, sudden mood swings, vomiting, irregular pulse, and memory impairment. Chronic heavy use may lead to high blood pressure, arrhythmia (irregular heartbeat), and cirrhosis (severe liver deterioration).

■ Nicotine

Nicotine is also considered a gateway drug. It is a highly addictive, colorless, highly volatile liquid alkaloid found in all tobacco products, including cigarettes, chewing tobacco, pipe tobacco, and cigars. Because nicotine is so addictive and tobacco use is still socially acceptable under certain circumstances, smokers often start young and have an extremely difficult time quitting. Long-term use of tobacco products can lead to several different chronic respiratory ailments and cancers.

■ Cannabis (Marijuana and Hashish)

Cannabis is the most widely used illicit drug[2] in the United States. Marijuana consists of the dried and crushed leaves, flowers, and seeds of the *Cannabis sativa* plant, which readily grows in many

[2]Federal law specifies that cannabis is an illicit drug, although 33 states have legalized this drug for medical purposes or for recreational use as of December 2019.

KEY TERMS

MDMA
a type of illicit drug known as Ecstasy or Adam that has stimulant and hallucinogenic properties

ethanol
the chemical and pharmacological term for drinking alcohol; the psychoactive ingredient in alcoholic beverages; often called *grain alcohol*

Courtesy of DEA.

Designer pills made from the illicit drug Ecstasy. This drug has some stimulant properties like amphetamines as well as hallucinogenic properties like LSD.

parts of the world. Delta-9-tetrahydrocannabinol (THC) is the primary psychoactive, mind-altering ingredient in marijuana that produces euphoria (often referred to as a "high"). Plant parts (mainly the leaves and buds of the plant) are usually dried, crushed, and smoked much like tobacco products. Other ways of ingesting marijuana include finely crushing the leaves and mixing them into the butter or oil that goes into making cookie or brownie batter and baking the batter. Another current derivative is **marijuana wax**, also known as *wax* or *ear wax*, *butter*, *honey oil*, *shatter*, *BHO* (which stands for "butane honey oil" or "butane hash oil"), and *dabs*. To date, this is one of the most powerful and the most potent (80% pure THC) types of marijuana on both the illegal and legal drug markets (in states where marijuana has either been decriminalized or medically sanctioned), with smoking or vaporizing this type of marijuana leading to a "quicker, stronger high" (Kimble, 2013). Finally, hashish is a cannabis derivative that contains the purest form of resin and also has extremely high amounts of THC.

KEY TERMS

marijuana wax
a more recent, extremely potent cannabis product with approximately 80% THC levels made by using butane to extract the THC; the process produces a "waxy" residue that is smoked or vaporized and is highly hallucinogenic, often resulting in high levels of physical and mental impairment

designer drugs
new drugs that are developed by people intending to circumvent the illegality of a drug by modifying a drug into a new compound; Ecstasy is an example. Also known as *synthetic drugs* or *synthetic opioids*

synthetic drugs or synthetic opioids
see designer drugs

structural analogs
new molecular species created by modifying the basic molecular skeleton of a compound; structural analogs are structurally related to their parent compounds

Designer Drugs, Synthetic Drugs, and Synthetic Opioids

In addition to the most commonly abused illicit drug categories just described, innovations in technology have produced new categories known as **designer drugs**, **synthetic drugs**, and **synthetic opioids**. These relatively new types of drugs are developed by people who seek to circumvent the illegality of a drug by modifying the drug into a new compound. Ecstasy is an example of a designer drug, synthetic drug, or synthetic opioid. Such drugs are created as **structural analogs** of substances already scheduled and legally prohibited under the Controlled Substances Act. Structural analogs are the drugs that result from altered chemical structures of already existing illicit drugs. Generally, these drugs are created by an underground chemist whose goal is to make a profit by creating compounds that mimic, change, or intensify the psychoactive effects of controlled substances. The number of designer drugs that are created and sold illegally is extremely large.

Anyone with knowledge of college-level chemistry can alter the chemical ingredients and produce new designer drugs, although it may be nearly impossible to predict their properties or effects except by trial and error. Currently, three major types of synthetic analog drugs are available through the illicit drug market: analogs of PCP; analogs of fentanyl and meperidine (both synthetic narcotic analgesics), such as Demerol or MPPP (also called MPTP or PEPAP); and analogs of amphetamine and methamphetamine (which have stimulant and hallucinogenic properties), such as MDMA, known as Ecstasy or Adam, which is widely used on college campuses as a euphoriant.

The production of these high-technology psychoactive substances is a sign of the new levels of risk and additional challenge to the criminal justice system. As the production and risk associated with the use of such substances increase, the need for a broader, better-informed view of drug use becomes even more important than in the past.

SYNTHETIC CANNABINOIDS: SPICE AND K2

Synthetic cannabinoids are human-made mind-altering chemicals that are either sprayed on dried, shredded plant material so they can be smoked or sold as liquids to be vaporized and inhaled in

e-cigarettes and other devices. These products are also known as *herbal* or *liquid incense* (NIDA, 2018c).

Synthetic cannabinoids are substances that are designed to affect the body in a manner similar to marijuana but are not derived from the marijuana plant (Office of National Drug Control Policy [ONDCP] 2013b). They are most often smoked like marijuana. Street names for synthetic cannabis include *Spice*, *K2*, *Mr. Smiley*, *Red X Dawn*, and *Blaze*. "A package of K2, a synthetic marijuana, is a concoction of dried herbs sprayed with chemicals, used in the herbal blends that are sold in head shops on the Internet to a growing number of teens and young adults" (Caldwell, 2010). Many of the contents are listed as inactive on the product packaging (DEA. 2012). A retired organic chemistry researcher from Clemson University reports medical problems from synthetic cannabis use as "overdoses, cases of addiction, and even suicide" (Caldwell, 2010).

Courtesy of DEA.

K2 contains synthetic cannabinoids that affect the body in similar fashion as marijuana.

K2 and Spice are generic trademarks that first went on sale in 2000, initially as legal herbs.

HERE AND NOW

Spice and K2: Past and Current Usage Rates

Spice, also known as *herbal incense*, is dried, shredded plant material treated with a cannabinoid analog. Although labels on spice products will list the ingredients as "natural" psychoactive plant products, chemical analyses show that their active ingredients are primarily synthetic cannabinoids added to the plant material. These synthetic analogs function similarly to the active ingredient in marijuana, Δ9-THC (SAMHSA, 2014a).

K2 and *Spice* are two names for a more recently created psychoactive designer drug whose dried, leafy, natural herbs are sprayed with a psychoactive chemical; it is then smoked so the user can experience euphoric effects. In 2011, prior to the Synthetic Drug Abuse Prevention Act being signed into law, one in nine U.S. high school seniors reported having used synthetic marijuana. In 2012, a large sample survey found that annual prevalence was 11.4%, ranking synthetic marijuana as the second most widely used class of illicit drug after marijuana among 12th graders (Johnston et al., 2016). In 2018, synthetic marijuana use significantly dropped. Annual use in 2018 among 8th graders was 1.6%, 10th graders 2.9%, and 12th graders 3.5% (NIDA, 2018c).

Eighth, 10th, and 12th graders were asked if they associated a great risk with trying synthetic marijuana once or twice; the results showed that there was quite a low level of perceived risk (only 23% and 25%, respectively, thought there was great risk in using once or twice).

Another study at a large public university in Georgia between November 2011 and March 2012 found that the highest level of use was among male students largely identifying with the lesbian, gay, bisexual, and transgender (LGBT) community. This was the first known study to obtain a detailed profile of users of any type of synthetic cannabinoid. Findings indicated the following:

1. The average age of first use was 18 years.
2. The percentage ever using synthetic cannabinoids was twice as high for males as for females (19% vs. 9%).
3. Heavier users were more likely to identify themselves as LGBT; significantly less usage was found in students identifying themselves as heterosexual.

Earlier findings are that "[e]fforts at the federal and state levels to close down the sale of these substances appear to be having an effect" (Johnston et al., 2016. Overall, beginning in 2015 through 2018, use of synthetic marijuana cannabinoids, (K2 and Spice) have statistically decreased for 8th, 10th, 12th graders and college students).

Data from Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2013). *Monitoring the Future National Results on Drug Use: 2012 Overview, key findings on adolescent drug use*. Ann Arbor, MI: Institute for Social Research, The University of Michigan; Center for Substance Abuse Research (CESAR). (2013, May 20). Study finds that 14% of undergraduate students at a Southeastern University report synthetic cannabinoid use; users more likely to be male and identify as LGBT. *CESAR FAX*. Retrieved from http://www.cesar.umd.edu; Johnston, L. D., O'Malley, P. M., & Miech, R. A., Bachman, J. G., & Schulenberg, J. E. (2016, February). *Monitoring the Future National Survey Results on Drug Use, 1975–2015: Overview, key findings on adolescent drug use.* Ann Arbor, MI: Institute for Social Research, University of Michigan; National Institute on Drug Abuse (NIDA). (2018c). *Synthetic cannabinoids (K2/Spice)*. Bethesda, MD: Author. Retrieved from https://www.drugabusegabuse.gov/publications/drugfacts/synthetic-cannabinoids-k2spice

Several years later, it was discovered that they contained synthetic cannabinoids that affected the body in a similar fashion as marijuana (cannabis). In July 2012, federal law placed this drug under Schedule I, making it an illegal drug with the highest abuse potential. The illegality of this drug removed it from retail sales.

As mentioned, before 2012, Spice was sold as a legal herb-based alternative to cannabis. The ingredients list contained only herbs, with no cannabinoid constituents; however, the listed ingredients seemed suspiciously unlikely to produce the drug's reported effects. Street names and slang terms for K2 and Spice include *Spice, K2, Blaze, Red X Dawn, Bliss, Black Mamba, Bombay Blue, Fake Weed, Genie, Spice*, and *Zoh*.

Numerous organizations have now tested the chemicals used to produce the high in synthetic marijuana, that includes K2-Spice. "The five primary research chemicals that mimic THC, are JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol" (The Partnership for a Drug Free New Jersey, n.d.).

The U.S. Army, U.S. Marines, U.S. Air Force, U.S. Coast Guard, and U.S. Navy have also outlawed this drug, and violators risk immediate expulsion from service and incarceration. (For information regarding the extent of Spice use, see "Here and Now: Spice and K2: Past and Current Usage Rates.")

Photographed by Kimberly Potvin.

Inhalants. These volatile chemicals, which include many common household substances, are often the most dangerous drug, per dose, a person can take. In addition, inhalants are most often used by young children.

■ Anabolic Steroids

Steroids are a synthetic form of the male hormone testosterone. They are often used to increase muscle size and strength. Medically, steroids are used to increase body tissues, treat allergies, or reduce swelling. Steroids are available in either liquid or pill form. Athletes have a tendency to use and abuse these drugs because they can dramatically increase body mass and muscle tissue. Some side effects include heart disease, liver cancer, high blood pressure, septic shock, impotence, genital atrophy, manic episodes, depression, violence, and mood swings.

■ Inhalants and Organic Solvents

Inhalants and organic solvents also are often considered gateway drugs and are extremely attractive to and popular among preteens and younger teenagers. Products used include gasoline, model airplane glue, and paint thinner. When inhaled, the vapors from these solvents can produce euphoric effects. Organic solvents can also refer to certain foods, herbs, and vitamins such as "herbal Ecstasy."

■ Narcotics and Opiates

These drugs depress the CNS and, if taken in a high enough quantity, produce insensibility or stupor. Narcotics or opiates are highly addictive. Narcotics include heroin, opium, morphine, codeine, meperidine (often a substitute for morphine, also known as Demerol), Darvon, and Percodan.

An Overview of Drugs in Society

Many people think that problems with drugs are unique to this era. In reality, drug use and abuse have always been part of nearly all—past and present—human societies. For example, the Grecian oracles of Delphi used drugs, Homer's Nestor's Cup induced sleep and provided freedom from care, and the mandrake root mentioned in Genesis, the first book of the Bible, produced a hallucinogenic effect. In Genesis 30:14–16, the mandrake is mentioned in association with bartering for lovemaking:

> In the time of wheat harvest Reuben went out, found some mandrakes in the open country, and brought them to his mother Leah. Then Rachel asked Leah for some of her son's mandrakes, but Leah said, "Is it so small a thing to have taken away my husband, that you should take my son's mandrakes as well?" However, Rachel said, "Very well, let him sleep

with you tonight in exchange for your son's mandrakes." So when Jacob came in from the country in the evening, Leah went out to meet him and said, "You are to sleep with me tonight; I have hired you with my son's mandrakes." That night he slept with her.

Ancient literature is filled with references to the use of mushrooms, datura, hemp, marijuana, opium poppies, and so on. Under the influence of some of these drugs, many people experienced extreme ecstasy or sheer terror. Some old pictures of demons and devils look very much like those described by modern drug users during so-called bummers, or bad trips. The belief that witches could fly may also have been drug induced because many natural preparations used in so-called witches' brews induced the sensation of dissociation from the body, as in flying or floating.

As far back as 2240 BC, attempts were made to regulate drug use. For instance, in that year, problem drinking was addressed in the Code of Hammurabi, where it was described as "a problem of men with too much leisure time and lazy dispositions." Nearly every culture has experienced drug abuse, and as found in the historical record, laws were enacted to control the use of certain types of drugs.

How Widespread Is Drug Abuse?

As previously mentioned, drug abuse today is more acute and widespread than in any previous age (see "Here and Now: Numbers of Past Month: Illicit Drug Users and Illicit Drug Use Among People Aged 12 or Older by Age Group"). The evidence for this development is how often large quantities of illicit drugs are seized in the United States and throughout the world. Media exposure about illicit drug use is more likely to occur today than in the past. On any given day, you can scan most major national and international newspapers and run across stories about illegal drug manufacture, storage and distribution, use or abuse, and convictions. Drug use is an **equal-opportunity affliction**. This means that no one is immune from the effects of using or abusing both licit and

Courtesy of the Advertising Council.

Although the media is often credited with glamorizing dangerous drug use, many successful prevention campaigns have used TV, radio, and print media as outlets. Since the Advertising Council began its "Friends Don't Let Friends Drive Drunk" campaign, 79% of Americans have stopped an intoxicated friend from getting behind the wheel.

KEY TERM

equal-opportunity affliction
refers to the use of drugs, stressing that drug use cuts across all members of society regardless of income, education, occupation, social class, or age

HERE AND NOW

Numbers of Past-Month Illicit Drug Users and Age Groups by People Aged 12 and Older, 2018

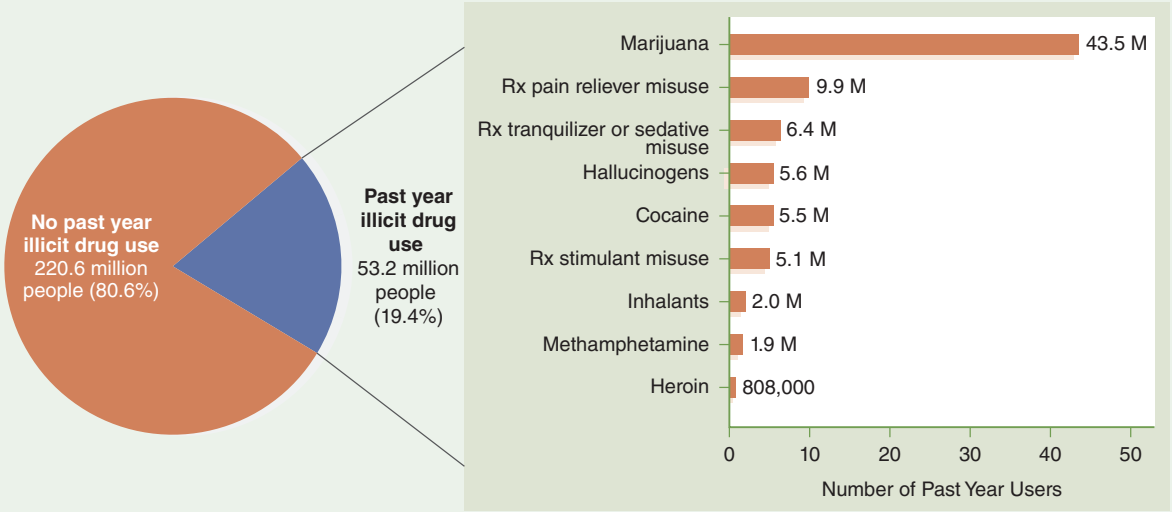
Among people aged 12 and older in 2018, an estimated 53.2 million people used illicit drugs in the preceding year (**Figure A**), meaning that they had used an illicit drug during the year before the survey interview. The 53.2 million people who used illicit drugs corresponds to 19.4% of the population or approximately one in five people 12 and older in the United States (SAMHSA, 2019a).

The most commonly used illicit drug in the preceding year was marijuana, which was used by 43.5 million people. The second most common type of illicit drug use in the United States was prescription pain relievers: an estimated 9.9 million people in the preceding year. The third most common type of illicit drug use was prescription tranquilizers or sedatives: 6.4 million people. The fourth most common type of illicit drug use was hallucinogens by an estimated 5.6 million people. The fifth most common type of illicit drug use was cocaine with 5.5 million people. The smaller numbers of other past-year users

(*continues*)

HERE AND NOW

Numbers of Past-Month Illicit Drug Users and Age Groups by People Aged 12 and Older, 2018 (*continued*)



Rx = prescription.
Note: The estimated numbers of past year users of different illicit drugs are not mutually because people could have used more than one type of illicit drug use in the past year.

FIGURE A Number of past month illicit drug users among persons aged 12 or older: 2018.

misusing prescription stimulants, inhalants, methamphetamine, and heroin is also shown in Figure A (SAMHSA, 2019b).

The age breakdown of past-year illicit users is as follows:

- *Aged 12–17*: Approximately 4.2 million adolescents aged 12 to 17 in 2018 were past-year illicit drug users, which corresponds to about one in six adolescents.
- *Aged 18 to 25*: Approximately two in five young adults aged 18 to 25 in 2018 (38.7%) were past-year users of illicit drugs. This percentage corresponds to about 13.2 million young adults who used illicit drugs in the past year.
- *Aged 26 or older*: In 2018, about one in six adults aged 26 or older (16.7%) were past-year users of illicit drugs, or about 35.9 million adults in this age group (SAMHSA, 2019a).

Data from Substance Abuse and Mental Health Administration (SAMHSA). (2019). *Key substance use and mental health indicators in the United States: Results from the 2018 National Survey on Drug Use and Health* (HHS Publication No. PEP19-5068, NSDUH Series H-54). Rockville, MD: Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA). Retrieved from https://www.samhsa.gov/data

illicit drugs. Research shows that drug consumption is found across the many different income, education, social class, occupation, race and ethnic, lifestyle, and age groups. To date, no one has proven immune from drug use or abuse.

Many of us, for example, are dismayed or surprised when we discover that certain individuals we admire—our family members (a mother, father, aunt, uncle, cousin, grandparent), close friends, workmates, celebrities, politicians, athletes, clergy, law enforcement personnel, physicians, academics, and even the seemingly upstanding man or woman next door—either admit to are accused of, need treatment for, or are arrested for licit or illicit drug use. We are also taken aback when we hear that cigarettes, alcohol, and marijuana abuse are commonplace in many public and private middle schools. Furthermore, most of us know of at least one (and many times more than one) close friend or family member who appears to secretly or not so secretly use drugs.

■ Extent and Frequency of Drug Use in Society

Erich Goode (2012), a much-respected sociologist, lists the following four types of drug use.

1. *Legal instrumental use*: Taking prescribed drugs and OTC drugs to relieve or treat mental or physical symptoms.

2. *Legal recreational use*: Using such licit drugs as tobacco, alcohol, and caffeine to achieve a certain mental or psychic state.
3. *Illegal instrumental use*: Taking drugs without a prescription to accomplish a task or goal such as taking nonprescription amphetamines to drive through the night or relying excessively on barbiturates to get through the day.
4. *Illegal recreational use*: Taking illicit drugs for fun or pleasure to experience euphoria such as abusing prescribed methylphenidate (Ritalin) as a substitute for cocaine.

Why has the prevalence of licit and illicit drug use remained consistent since 1988? Why has this trend occurred when federal, state, and local government expenditures for fighting the drug war have been increasing at the same time? There are several possible answers, none of which offers a satisfactory response by itself. One perspective notes that practically all of us use drugs in some form, with what constitutes "drug use" being merely a matter of degree. A second explanation is that more varieties of both licit and illicit drugs are available today. One source estimated that approximately 80% of all currently marketed drugs were either unknown or unavailable 30 years ago (Critser, 1996). Regarding prescriptions, "the average number of prescriptions per person, annually, in 1993 was seven, and in 2005 it was 12 and in 2011, 13 prescriptions per person in the [United States]" (Critser, 2005, p. 23). Another source stated, "The retail sales of all OTC drugs that includes approximately 27 categories of drugs totaled over $35.2 billion in 2018" (CHPA, 2019). "In the United States, the rate of yearly prescription growth is projected to be 3.8% rate of inflation in the year 2020" (Bresnick, 2019).

By 2024, the total global prescription pharmaceutical market is projected to be at $1.2 trillion in sales. Similarly, other findings reflecting problems with prescription drug use are as follow (NIDA, 2014b):

- Fifty-two million people in the United States older than 12 have used prescription drugs nonmedically in their lifetime.
- Percentage of persons using at least one prescription drug in the past 30 days: 48.4% (2013–2016) (CDC, 2017a).
- Nearly 70% of Americans are on at least one prescription drug, and more than half take two.
- Approximately 6.1 million Americans have used prescription drugs nonmedically in the past month.
- Although the United States is just 5% of the world's population, it consumes 75% of the world's prescription drugs.
- With regards to obtaining prescription drugs, 54.2% reported obtaining them for free from a friend or relative, 18.1% from one doctor, and 16.6% buying or taking them from a friend or relative.

Such figures indicate that it may be more difficult to find people who do not use psychoactive drugs compared to individuals who do.

Further, a third category of drug sales has joined OTC and prescription drugs: herbal medicines, vitamins, minerals, enzymes, and other natural potions. According to Boyles (2009), "Out-of-pocket spending on herbal supplements, chiropractic visits, meditation, and other forms of complementary and alternative medicines (CAM) was estimated at $34 billion in a single year" and "Americans spend almost a third as much money out-of-pocket on herbal supplements and other alternative medicines as they do on prescription drugs." A more recent study found that "Americans will spend $21 billion on vitamins and herbal supplements in 2015. If protein powders are included, supplements are as big a market as all organic foods combined" (Scott, 2015). This is even though the U.S. Preventive Services Task Force does not recommend regular use of any multivitamins or herbs.

Other findings regarding these types of drugs include the following:

- More than four in five American adults (86%) take vitamins or supplements, according to a recent online survey conducted by the Harris Poll on behalf of the American Osteopathic Association (AOA, 2019).
- Americans will spend $21 billion on supplements in 2015.
- An estimated 75% of the world's population uses or has used some type of supplement, according to PharmacyTimes.com (Superior Supplement Manufacturing, 2019).
- "In the US alone, an estimated 54 million people over the age of 12 have used prescription drugs for nonmedical reasons in their lifetime" (Talbott Recovery, 2019).
- "Most abused prescription drugs fall under four categories, based on the number of people who misuse the drug: [p]ainkillers—3.3 million users, [t]ranquilizers—2 million users [s]timulants—1.7 million users Sedatives—0.5 million users" (Talbott Recovery, 2019).

- The Food and Drug Administration (FDA) only spot tests 1% of the 65,000 dietary supplements on the market.

Drug use is so common that the average household in the United States owns about five drugs, of which two are prescription drugs and three are OTC drugs. Of the many prescriptions written by physicians, approximately one-third modify moods and behaviors in one way or another. A 2010 National Institute on Drug Abuse (NIDA, 2010) study and other research indicate that more than 60% of adults in the United States have, at some time in their lives, taken a psychoactive drug (one that affects mood or consciousness). More than one-third of adults have used or are using depressants or sedatives.

A third explanation is that "in the modern age, increased sophistication has brought with it techniques of drug production and distribution that have resulted in a worldwide epidemic of drug use" (Kusinitz, 1988, p. 149). In the 1980s and 1990s, for example, illicit drug cartels proliferated, and varieties of marijuana with ever-increasing potency infiltrated all urban and rural areas in the United States, as well as the world. Many of these varieties are crossbred with ultrasophisticated techniques and equipment available everywhere.

Finally, even coffee has undergone a technological revolution. Higher levels of caffeine content have become available worldwide. This trend has led to the phenomenal growth of the following: (1) franchise duplication of gourmet coffee bars in the United States (e.g., Starbucks, Peet's, Three Brothers Coffee); (2) sales of espresso and cappuccino coffeemakers for home use, with accompanying coffee grinders or coffee pods and capsules; and (3) sales of specialized coffees and teas through a multitude of email coffee and tea clubs.

Before 1990, it was difficult to purchase a cup of espresso or cappuccino in a typical restaurant (Meister, 2017); today, such types of coffees are widely available. Even at university unions and libraries, airports, shopping malls, and inner-city coffee shops, it is not unusual to see people lined up waiting to order and purchase their specially made and specially flavored coffee or tea. This is just one example of how caffeine (often seen as a benign drug) has evolved, with many new varieties of coffee beans from exotic islands and countries coming together with more sophisticated electronic equipment, with the result that the idea of simple brewing has been relegated to the past. The standard American "cup of coffee in the morning" has spilled into including coffee during the afternoon and evening. This is a small example of a much-tolerated drug maintaining its own impressive history of development, increased use, complexity in developing many more varieties, and added sophistication.

■ Drug Use: Statistics, Trends, and Demographics

An incredible amount of money is spent each year on both licit and illicit chemicals that alter consciousness, awareness, or mood. The following are six categories of widely used licit and illicit types of psychoactive drugs:

1. *Social drugs.* Total costs, which includes costs to society, are approximately $249 billion on alcohol alone each year. The total economic cost of smoking is more than $300 billion a year, including nearly $170 billion in direct medical care for adults and more than $156 billion in lost productivity from premature death and exposure to secondhand smoke. In 2017, tobacco companies spent $9.36 billion marketing cigarettes and smokeless tobacco in the United States. This translates to more than $25 million each day, or more than $1 million every hour (CDC, 2017b). During 2012–2016, total U.S cigar unit sales grew by 29%, which was largely driven by increasing sales of cigarillos (CDC, 2017b).
2. *Prescription drugs.* In 2019, the total prescription drug revenue worldwide is expected to generate $844 billion U.S. in prescription drug revenue worldwide. Revenues are expected to reach nearly $1.2 trillion U.S. by 2024. There is an increasing growth especially in sales of so-called orphan drugs for the treatment of rare diseases (Mikulic, 2019). More than 131 million people—66% of all adults in the United States—use prescription drugs. Utilization is particularly high for older people and those with chronic conditions (Health Policy Institute, 2019).
3. *Over-the-counter (patent) drugs.* These products, including cough and cold items, external and internal analgesics, antacids, laxatives, antidiarrheal products, sleep aids, sedatives, and so on, had $35.2 billion in sales in 2018, with U.S. households spending an average of $338 per year on OTC products. Eighty-one percent of adults use OTC medicines as a first response to minor ailments (CHPA, 2019).
4. *Illicit drugs.* A report prepared by the RAND Corporation for the White House estimated that over a 10-year period, from 2000 to 2010,

an astonishing $1 trillion was spent on illicit drugs (Ferner, 2014). Pinpointing specific types of drugs, another source indicated that in 2016, Americans spent $145 billion on cannabis, cocaine, heroin, and methamphetamine, according to a new report (Midgette, 2019). Surveys of 8th, 10th, and 12th graders combined indicated that in 2017 and 2018, 34.4% and 33.9%, respectively had used an illicit drug during their lifetimes (Statista Inc., 2019).

5. *Nonmedical use and misuse of prescription-type drugs. P*rescription pain reliever misuse was the second most common form of illicit drug use in the United States in 2018, with 3.6% of the population misusing pain relievers. For people 12 and older and young adults 18 to 25, the percentages who misused prescription pain relievers in the preceding year were lower in 2018 than from 2015 to 2017. Similar decreases in pain reliever misuse were observed for adolescents 12 to 17 and adults 26 and older in 2018 compared with 2015 and 2016 but not when compared with 2017. Among people aged 12 and older in 2018 who misused pain relievers in the preceding year, the most common main reason for their last misuse of a pain reliever was to relieve physical pain (63.6%). More than half (51.3%) of people who misused pain relievers in the preceding year obtained the last pain reliever they misused from a friend or relative. The National Survey on Drug Use and Health (NSDUH) also allows an estimation of opioid misuse, which is defined as the use of heroin or the misuse of prescription pain relievers. In 2018, an estimated 10.3 million people 12 or older misused opioids in the preceding year, including 9.9 million prescription pain reliever misusers and 808,000 heroin users. Approximately 506,000 people misused prescription pain relievers and used heroin in the past year. The percentage of people aged 12 or older in 2018 who were past-year opioid misusers was lower than the percentages between 2015 and 2017, which was largely driven by declines in pain reliever misuse rather than by changes in heroin use. Finally, in 2018, the substances with the largest number of recent (i.e., past year) initiates of use or misuse were alcohol (4.9 million new users), marijuana (3.1 million new users), prescription pain relievers (1.9 million new misusers), and cigarettes (1.8 million new users) (SAMHSA, 2019a).
6. *Miscellaneous.* Finally, the amount spent on inhalants and other miscellaneous drugs, such as nutmeg and morning glory seeds, cannot be estimated.

During 2016, an estimated 48,501,000 persons, or 18.0% of persons aged 12 and older, reported using illicit drugs or misusing prescription drugs in the preceding year (CDC, 2018b).

- By gender, the prevalence was 20.7% among males and 15.5% among females.
- By age, prevalence was highest among persons aged 18–25 (37.7%) and persons aged 26–34 (28.0%).
- By race and ethnicity, prevalence ranged from 9.2% among Asians to 23.6% among American Indians or Alaska Natives.

Regarding nationwide trends in the use of illicit drug use in 2018, the following findings are noteworthy:

- More than half of new illicit drug users begin with marijuana. Next most commonly used are prescription pain relievers followed by inhalants (which is most common among younger teens).
- After alcohol, marijuana has the highest rate of dependence or abuse among all drugs. Drug use is highest among people in their late teens and 20s. In 2013, 22.6% of those 18 to 20 reported using an illicit drug in the preceding month.
- In 2018, nearly one in five people 12 or older (19.4%) used an illicit drug in the preceding year, which is a higher percentage than in 2015 and 2016. The estimate of past-year illicit drug use for 2018 was driven primarily by marijuana use, with 43.5 million past-year marijuana users. The percentage of people 12 and older in 2018 who used marijuana in the past year (15.9%) was higher than the percentages in 2002 to 2017 (SAMHSA, 2019a).
- Prescription pain reliever misuse was the second most common form of illicit drug use in the United States in 2018, with 3.6% of the population misusing pain relievers. For people 12 and older and young adults 18 to 25, the percentages who misused prescription pain relievers in the preceding year were lower in 2018 than in 2015 to 2017 (SAMHSA, 2019a).
- Among people 12 and older in 2018 who misused pain relievers in the preceding year, the most common main reason for their last misuse of a pain reliever was to relieve physical pain (63.6%). More than half (51.3%) of people who misused pain relievers in the preceding year obtained the last pain reliever

they misused from a friend or relative (SAMHSA, 2019a).

- In 2018, an estimated 10.3 million people 12 and older misused opioids[3] in the previous year, including 9.9 million prescription pain reliever misusers and 808,000 heroin users. Approximately 506,000 people misused prescription pain relievers and used heroin in the preceding year (SAMHSA, 2019a).
- The percent of teens who reported past-month marijuana vaping rose from 2.6% to 3.9% of 8th graders, from 7.0% to 12.6% of 10th graders, and from 7.5% to 14.0% of 12th graders. This increase in past-month marijuana vaping in high school seniors is the second largest single-year increase ever measured in the 45-year history of the *Monitoring the Future* (MTF) survey (NIDA, 2019b).
- Cigarette smoking continued a downward trend and significantly fell among 12th graders reporting past-month use, daily use, or consumption of one-half pack or more per day.
- Significant five-year declines in cigarette smoking were reported by all grades and across all prevalence periods, including lifetime use (NIDA, 2019b).
- Past-month, past-year, and lifetime marijuana use remained steady among 8th, 10th, and 12th graders. Daily marijuana use, however, increased among 8th and 10th graders (NIDA, 2019b).
- Past-year prescription opioid misuse (reported in the survey as "narcotics other than heroin") continued a significant decline among 12th graders, with 2.7% reporting use in 2019 (NIDA, 2019b).
- In 2018, among full-time college students ages 19 to 22, 43% reported using marijuana sometime in the preceding 12 months and 25% reported using marijuana at least once in the previous 30 days. This represents the highest level of marijuana usage in the last 3.5 decades (Michigan News, 2019). Same-age high school graduates, ages 19–22, not attending college had similar rates of marijuana use (Michigan News, 2019).

[3]The National Survey on Drug Use and Health (NSDUH) defines opioid use as the misuse of prescription pain relievers or heroin.

Table 1.3 shows that in regard to age groups, those 18 to 25 are by far the *heaviest* users and

TABLE 1.3 Trend Data on the Prevalence of Illicit Drug Use: 2015–2018

	2015	2016	2017	2018
Used in Past Month				
All ages 12+	10.1[a]	10.6[a]	11.2	11.7
12–17	8.8[a]	7.9	7.9	8.0
18–25	22.3[a]	23.2	24.2	23.9
26+	8.2[a]	8.9[a]	9.5[a]	10.1
Used in Past Year				
All ages 12+	17.8[a]	18.0[a]	19.0	19.4
12–17	17.5	15.8	16.3	16.7
18–25	37.5	37.7	39.4	38.7
26+	14.6[a]	15.0[a]	16.1	16.7
Used in Lifetime (Ever Used)				
All ages 12+	48.8	48.5	49.5	49.2
12–17	25.3[a]	23.0	23.9	23.9
18–25	57.5[a]	56.3	57.0	55.6
26+	50.1	50.2	51.3	51.2

[a] Data difference between 2018 and this estimate significant at the 0.05 level. The rounding may make the estimates look identical.

Data from Substance Abuse and Mental Health Services Administration (SAMHSA). (2019b). *Results from the 2018 National Survey on Drug Use and Health: Detailed tables*. Rockville, MD: Author. Retrieved from https://www.samhsa.gov/data/sites/default/files/cbhsq-reports/NSDUHDetailedTabs2018R2/NSDUHDetTabsSect1pe2018.htm

HERE AND NOW

Sources of Prescription Drugs Misused by Youths

Although most people take prescription medications responsibly, in 2017 an estimated 18 million people (more than 6% of those aged 12 and older) misused such medications at least once in the preceding year. According to results from the 2017 National Survey on Drug Use and Health, an estimated 2 million Americans misused prescription pain relievers for the first time within the preceding year, which averages approximately 5,480 initiates per day. In addition, more than 1 million misused prescription stimulants, 1.5 million misused tranquilizers, and 271,000 misused sedatives for the first time (NIDA, 2018a).

In focusing on adolescents and young adults, the misuse of prescription drugs is highest among young adults 18 to 25, with 14.4% reporting nonmedical use in the previous year. Among youth 12 to 17, 4.9% reported past-year nonmedical use of prescription medications.

After alcohol, marijuana, and tobacco, prescription drugs (taken nonmedically) are among the most commonly used drugs by 12th graders. NIDA's *Monitoring the Future* survey of substance use and attitudes in teens found that about 6% of high school seniors reported past-year nonmedical use of the prescription stimulant Adderall in 2017, and 2% reported misusing the opioid pain reliever Vicodin (NIDA, 2018a).

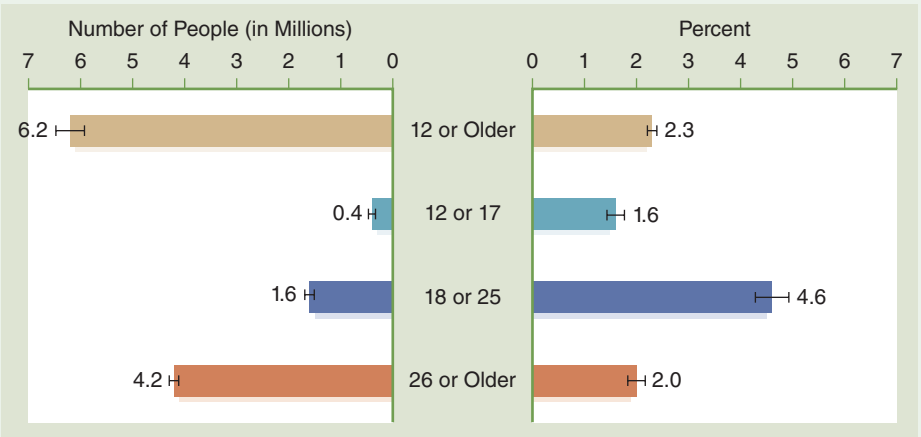
Youths who misuse prescription medications are also more likely to report using other drugs. Multiple studies have revealed associations between prescription drug misuse and higher rates of cigarette smoking, heavy episodic drinking, and marijuana, cocaine, and other illicit drug use among adolescents, young adults, and college students in the United States. In the case of prescription opioids, receiving a legitimate prescription for these drugs during adolescence is also associated with a greater risk of future opioid misuse, particularly in young adults who have little to no history of drug use (NIDA, 2018a).

Older Adults

Friends and family are the most common source of prescription drugs *misused** by youths in the United States, according to an analysis of data from NSDUH. Around one-half of youths who reported misusing prescription stimulants (50%), tranquilizers (47%), or sedatives (47%) in the past year said that they most recently obtained the medication for free from friends or family, as did one-third of those who reported the misuse of prescription opioids. The second most common source for obtaining stimulants, tranquilizers, and sedatives was purchasing from a friend or relative, drug dealer or stranger, or the Internet, and the second most common source for obtaining prescription opioids was acquiring them from a physician.

Another source (Keller, 2019) reported that teens get their prescription drugs from the following locations:

- medicine cabinets,
- a neighbor's house,
- Internet and online pharmacies,
- the dark web,
- a friend of a friend,
- at schools, and
- at parties.



Past month prescription misuse of pain relievers, tranquilizers, stimulants, and sedatives by age group: 2016.

(*continues*)

HERE AND NOW

Sources of Prescription Drugs Misused by Youths (*continued*)

According to a University of Florida study, "[u]sing someone else's medication is the most common form of prescription stimulant misuse among adolescents," with researchers finding that 88% of teens who used the drugs nonmedically in the previous 30 days said "they had obtained the medications from someone else" (Keller, 2020a). Friends and family are the most common source of prescription drugs *misused** by youths in the United States, according to an analysis of data from NSDUH. Around one-half of youths who reported misusing prescription stimulants (50%), tranquilizers (47%), or sedatives (47%) in the previous year said that they most recently obtained the medication for free from friends or family, as did one-third of those who reported the misuse of prescription opioids. The second most common source for obtaining stimulants, tranquilizers, and sedatives was purchasing from a friend or relative, drug dealer or stranger, or the Internet; the second most common source for acquiring prescription opioids was from a physician (CESAR, 2009; Schepis & Krishnan-Sarin, 2009).

*Misuse is defined as "taking a medication in a manner or dose other than prescribed; taking someone's else's prescription, even if for a legitimate medical complaint such as pain; or taking a medication to feel euphoria (i.e., to get high)" (NIDA, 2018a).

Note: Respondents also reported that prescription medicines were obtained "some other way" (stimulants, 5%; tranquilizers, 4%; sedatives, 12%; opioids, 7%). Data are from 36,992 adolescents aged 12 to 17 participating in the 2005 or 2006 National Survey on Drug Use and Health (or both). Of these youths, 8.3% reported any prescription drug misuse in the previous year, 7% reported opioid misuse, 2% reported tranquilizer misuse, 2% reported stimulant misuse, and 0.4% reported sedative misuse.

Reproduced from Center for Substance Abuse Research (CESAR). (2009). Friends and family are most common source of prescription drugs misused by youths. *CESAR FAX, 18*(32), using data from National Institute on Drug Abuse (NIDA). (2018a). Misuse of prescription drugs. Bethesda, MD: Author. Retrieved from https://www.drugabuse.gov/publications/misuse-prescription-drugs/overview; Schepis, T. S., & Krishnan-Sarin, S. (2009). Sources of prescriptions for misuse by adolescents: Differences in sex, ethnicity, and severity of misuse in a population-based study. *Journal of the American Academy of Child and Adolescent Psychiatry, 48*(8), 828–836; Substance Abuse and Mental Health Services Administration (SAMHSA). (2017). *Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health*. Rockville, MD: Author. Retrieved from https://www.samhsa.gov/data/sites/default/files/NSDUH-FFR1-2016/NSDUH-FFR1-2016.htm

experimenters in terms of past-month, past-year, and lifetime users.

Table 1.4 shows a more recent percentage of population and estimated number of alcohol, tobacco, and illicit drug users in the United States among persons aged 12 and older. In looking at *past-month usage*, an estimated 13.9 million Americans, or 51.1% of the total U.S. population age 12 and older, were drinkers. Statistics also reveal that with regard to past-month usage of cigarettes, approximately 46.9 million Americans (17.2%) smoked cigarettes, 31.9 million used illicit drugs (11.7%), and 27.6 million (8.4%) used marijuana in 2018 (see Table 1.4).

Current Patterns of Licit and Illicit Drug Use

Table 1.4 shows that both licit and illicit drug use occurs and remains at alarming rates. In looking at *lifetime* use of illicit types of drugs, it is estimated that approximately 13.4 million people—approximately one-half of Americans 49.2% age 12 and older—have used illicit drugs during their lifetime (SAMHSA, 2019b).

Figure 1.2 further shows that regarding lifetime use 80.8% of the U.S. population, used alcohol during sometime during their lifetime. Other lifetime drug uses and percentages of those using were cigarettes (55.7%); illicit drug use, which includes the misuse of prescription psychotherapeutics (49.2%); marijuana (45.3%); cocaine (14.7%); hallucinogens (15.8%); inhalants (9.1%); and heroin (1.9%) (see Figure 1.2).

Figure 1.3 shows the number of past-month illicit drug users among persons age 12 and older in 2018. The category of *illicit drugs* shows the highest use (31.9 million), followed by use of marijuana (27.7 million), psychotherapeutics (5.4 million), cocaine (1.9 million), hallucinogens (1.6 million), inhalants (0.6 million), and heroin (0.4 million).

NONMEDICAL USE OF PSYCHOTHERAPEUTIC DRUGS

Figure 1.4 shows percentage of past month nonmedical use of psychotherapeutic drugs (pain relievers, tranquilizers, stimulants, and sedatives)

TABLE 1.4 National Household Survey on Drug Abuse: 2018

Percentage of population and estimated number of alcohol, tobacco, and illicit drug users in the United States among persons aged 12 or older

	LIFETIME		PAST MONTH*	
Substance	Percentage	Number of Users (in Thousands)	Percentage	Number of Users (in Thousands)
Alcohol	80.8	221,220	51.1	139,835
Cigarettes	55.7	152,480	17.2	46,956
Any illicit drug†	49.2	134,791	11.7	31,918
Marijuana	45.3	123,935	10.1	27,667
Illicit drugs other than marijuana‡	¶nr	¶nr	3.2	8,855
Smokeless tobacco	15.6	42,599	2.9	7,972
Nonmedical use of any psychotherapeutic§	¶nr	¶nr	2.0	5,424
Pain Relievers	¶nr	¶nr	1.0	2,852
Cocaine	14.7	40,194	0.7	1,949
Crack	3.4	9,177	0.2	436
Tranquilizers	¶nr	¶nr	0.6	1,799
Hallucinogens	15.8	43,255	0.6	1,630
Ecstasy	7.3	19,949	0.3	689
LSD	10.0	27,339	0.2	458
PCP	2.2	6,085	0.0	34
Stimulants	¶nr	¶nr	0.6	1,670
Methamphetamine	5.4	14892	0.4	1,001
Inhalants	9.1	24,783	0.2	612
Heroin	1.9	5,108	0.1	354
Sedatives	§nr	§nr	0.1	243

Note: The results obtained from this national survey were completed at 181,879 addresses, and 68,991 completed interviews were obtained. The survey was conducted from January 2018 through December 2018. Weighted response rates for household screening and for interviewing were 73.3% and 66.6%, respectively.

**Lifetime* refers to ever used. This column shows the use of drugs from highest to lowest percentages as well as the number of persons using.

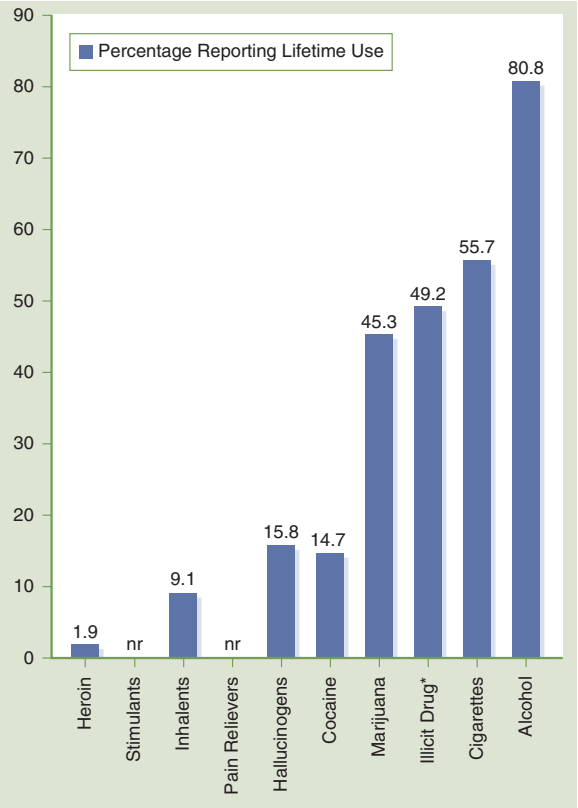
†Any illicit drugs, including the following: marijuana or hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

‡Illicit drugs other than marijuana include cocaine (including crack), heroin, hallucinogens, inhalant, or prescription-type psychotherapeutics used nonmedically.

§Nonmedical use of prescription-type psychotherapeutics includes the nonmedical use of pain relievers, tranquilizers, stimulants, or sedatives but does not include over-the-counter drugs.

¶nr = no report available

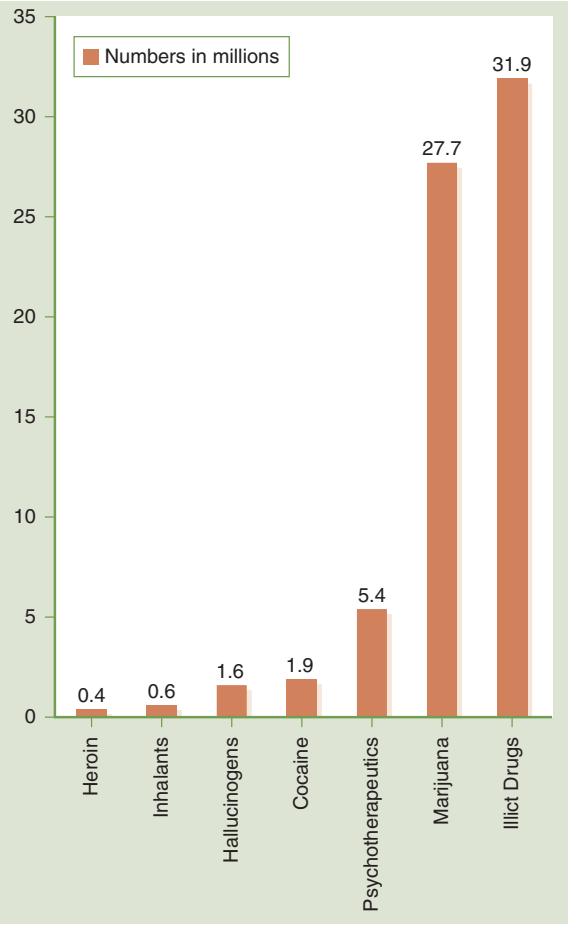
Data from Substance Abuse and Mental Health Services Administration (SAMHSA). (2019). *Results from the 2018 National Survey on Drug Use and Health: Detailed tables*. Rockville, MD: Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA).



*Illicit drug use in a lifetime includes the misuse of prescription psychotherapeutics.
nr These percentages are not reported due to measurement issues.

FIGURE 1.2 Percentage of U.S. residents aged 12 or older reporting lifetime use of alcohol, tobacco, and illicit drugs: 2018.

Data from Substance Abuse and Mental Health Services Administration (SAMHSA). (2019). *Results from the 2018 National Survey on Drug Use and Health: Detailed tables*. Rockville, MD: Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA).



*Illicit drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

FIGURE 1.3 Past-month use of selected illicit drugs among persons aged 12 or older, 2018. Illicit drugs include marijuana or hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

Data from Substance Abuse and Mental Health Services Administration (SAMHSA). (2019). *Results from the 2018 National Survey on Drug Use and Health: Detailed tables*. Rockville, MD: Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA). Retrieved from https://www.samhsa.gov/data/

among four age groups—12 and older, 12 to 17, 18 to 25, and 26 and older—from 2015 through 2018; also see the Case in Point highlighting the number of painkiller prescriptions in each of the 50 states and the District of Columbia in 2012 (CDC, 2014). These groupings also include drugs that may be available as prescription medications but currently are much more likely to be manufactured and distributed illegally; one such drug is methamphetamine, which is included under stimulants. The latest major findings of nonmedical use of psychotherapeutic drugs in 2018 include the following (SAMHSA, 2019a):

- Prescription psychotherapeutic drugs consist of prescription stimulants, tranquilizers or sedatives (including benzodiazepines), and pain relievers. In NSDUH, misuse of prescription drugs is defined as use in any way not directed by a doctor, including use without a prescription of one's own, use in greater amounts more often or longer than told to take a drug, or use in any other way not directed by a doctor. Misuse of over-the-counter drugs is not included (SAMHSA, 2019a).
- In 2018, an estimated 16.9 million Americans 12 and older misused prescription psychotherapeutic drugs at least once in the preceding year. This number of past-year prescription psychotherapeutic drug misusers corresponds to 6.2% of the population (SAMHSA, 2019a). Of the prescription drugs presented in this report, prescription pain relievers were the most commonly misused by people 12 and older (SAMHSA, 2019a).

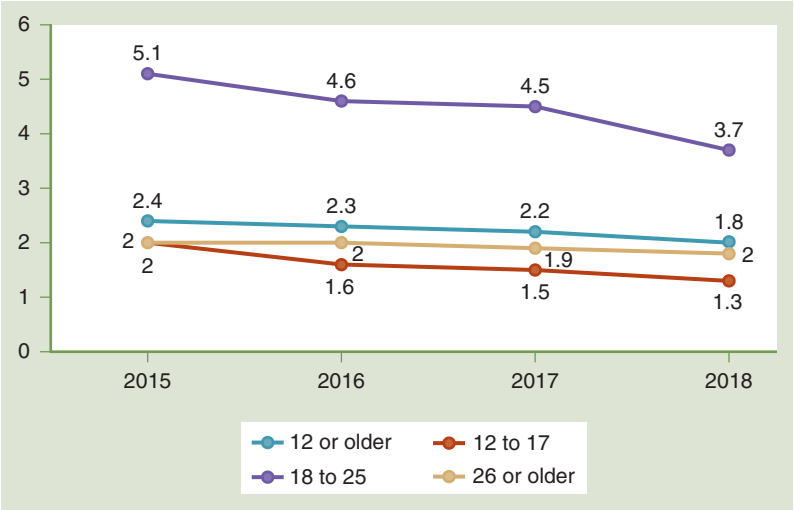


FIGURE 1.4 Past-month nonmedical use of types of psychotherapeutic drugs among persons aged 12 or older: 2015–2018.

Reproduced from Center for Behavioral Health Statistics and Quality (CBHSQ). (2015). *Behavioral health trends in the United States: Results from the 2014 National Survey on Drug Use and Health* (HHS Publication No. SMA 15-4927, NSDUH Series H-50). Rockville, MD: Author; Substance Abuse and Mental Health Services Administration (SAMHSA). (2017). *Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health* (HHS Publication No. SMA 17-5044, NSDUH Series H-52). Rockville, MD: Author; Substance Abuse and Mental Health Services Administration. (2019). *Key substance use and mental health indicators in the United States: Results from the 2018 National Survey on Drug Use and Health* (HHS Publication No. PEP19-5068, NSDUH Series H-54). Rockville, MD: Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA).

- The 16.9 million Americans in 2018 who had misused prescription psychotherapeutic drugs in the preceding year included 9.9 million who misused prescription pain relievers in that period, 5.1 million who misused prescription stimulants, and about 6.4 million who misused prescription tranquilizers or sedatives. The estimate for the misuse of tranquilizers or sedatives includes 5.4 million who misused prescription benzodiazepines in the past year (SAMHSA, 2019a).

Figure 1.5 shows past-month use of illicit drugs among persons 12 and older by age group in 2017

CASE IN POINT

State Differences in the Number of Painkiller Prescriptions per 100 People, 2017

The color-coded U.S. map (**Figure A**) shows the number of painkiller prescriptions per 100 people in each of the 50 states plus the District of Columbia in 2017 (CDC, 2017a). The major findings include the following:

- The overall national opioid prescribing rate declined from 2012 to 2017, and in 2017 the prescribing rate had fallen to the lowest in more than 10 years at 58.7 prescriptions per 100 persons (total of more than 191 million total opioid prescriptions) (CDC, 2017a).
- However, in 2017, prescribing rates continued to remain especially high in certain areas across the country.
- In 16% of U.S. counties, enough opioid prescriptions were dispensed for every person to have one (CDC, 2017a).
- Leading the country in highest pain prescriptions per 100 persons are Alabama, Arkansas, Mississippi, and Tennessee.
- The states with the lowest pain prescriptions per 100 persons were New York, Hawaii, and California, as well as the District of Columbia.

Figure B shows the total number and rate of opioid (painkiller) prescriptions dispensed in the United States between 2006 and 2017.

(*continues*)

CASE IN POINT

State Differences in the Number of Painkiller Prescriptions per 100 People, 2017 (*continued*)

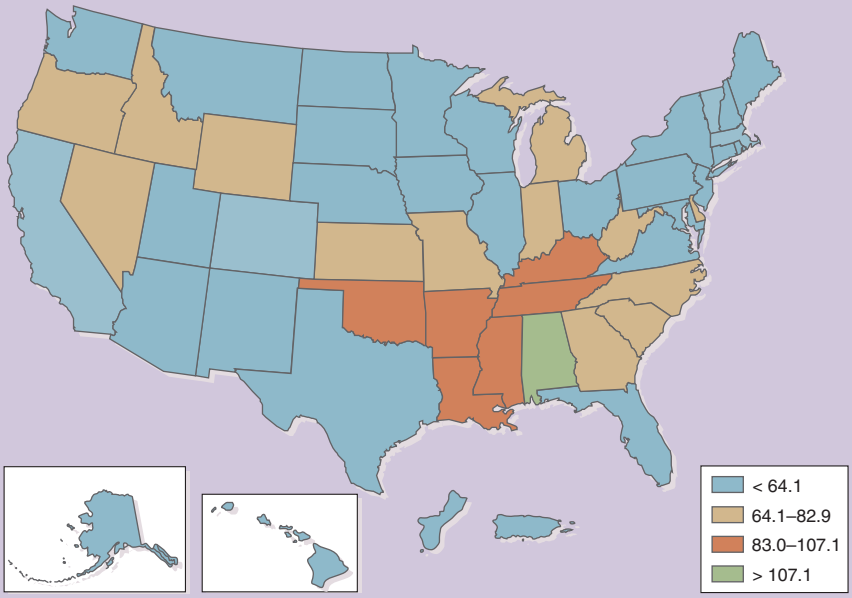


FIGURE A This color-coded U.S. map shows the number of painkiller prescriptions per 100 people in each of the 50 states in 2017.

Reproduced from Centers for Disease Control and Prevention (CDC). (2017c). *U.S. state prescribing rates, 2017*. Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from https:// www.cdc.gov/drugoverdose/maps/rxstate2017.html

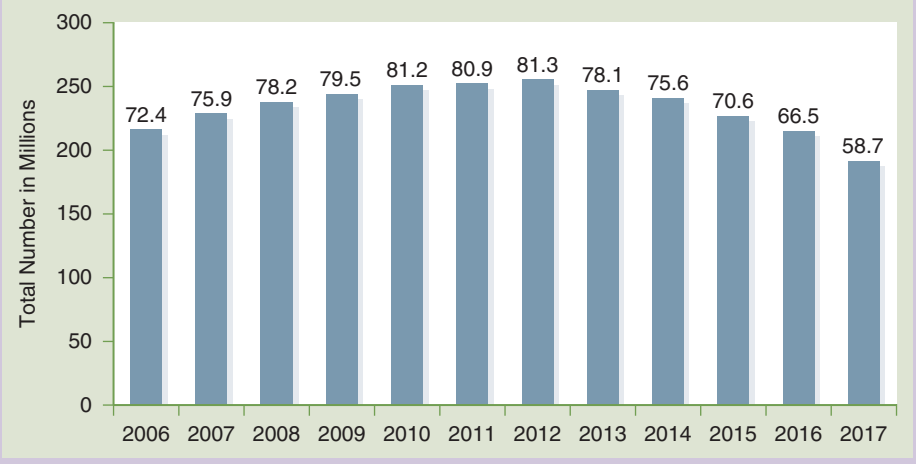


FIGURE B Total number and rate of opioid prescriptions dispensed per 100 persons, United States, 2007–2017.

Reproduced from Centers for Disease Control and Prevention (CDC). (2018c). *U.S. opioid prescribing rate maps*. Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html

and 2018. With regard to age patterns, the following trends are apparent:

- Rates of drug use show significant variation by age group.
- In comparing 2017 with 2018, past-month illicit drug use was similar across age groups.
- In comparing 2017 with 2018, excluding ages 18 to 25, across all other age groups (12 or older, 12 to 17, and 26 or older), past-month illicit drug use increased slightly in 2018.
- The highest percentage of illicit drug use was among those 18 to 25 (24.2% in 2017 and 23.9% in 2018).
- Of the four age groups (12 or older, 12 to 17, 18 to 25, and 25 and older), those 12 to 17

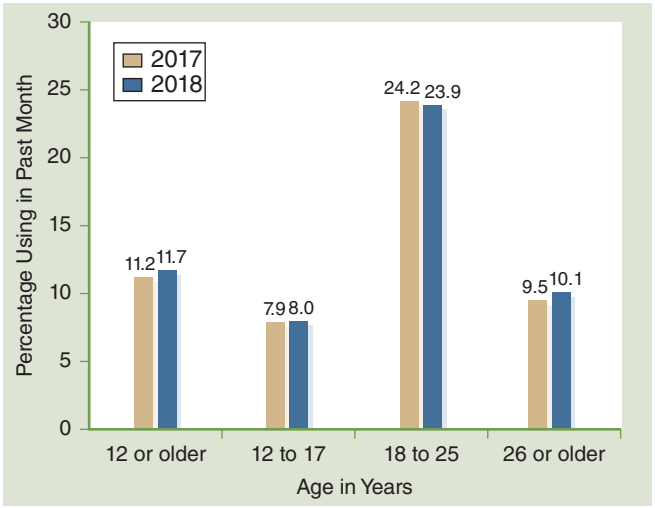


FIGURE 1.5 Percentage of past-month illicit drug use among persons aged 12 or older, by age: 2017 and 2018.

Reproduced from Substance Abuse and Mental Health Services Administration (SAMHSA). (2019). *Results from the 2018 National Survey on Drug Use and Health: Detailed tables*. Rockville, MD: Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA). Retrieved from https://www.samhsa.gov/data/

had the lowest percentage of past-month illicit drug use.

RACIAL AND ETHNIC DIFFERENCES

Figure 1.6 shows average past-month illicit drug use among persons age 12 or older by race and ethnicity (black or African American, white, Hispanic or Latino, and Asian) for 2018. The figures in this chart reveal the following trends.

In 2018, the following were the major findings regarding illicit drug use by gender, education: college versus noncollege students, ethnicity and race, and criminal justice populations reported with earlier publishing dates.

GENDER

- In 2018, as in preceding years, the rate of past-month illicit drug use among persons 12 and older was higher for males (14.0%) than for females (9.5%). Males were more likely than females to be current users of several different illicit drugs, including marijuana (12.3% vs. 8.0%), cocaine (1.0 vs. 0.4%), hallucinogens (0.8 vs. 0.4%), and crack (0.2% vs. 0.1%).
- In 2015, women continually have lower rates of substance use and substance use disorders (SUDs) than men. For example, past-year illicit drug dependence or abuse was 3.4% for men and 1.9% for women (SAMHSA, 2015).

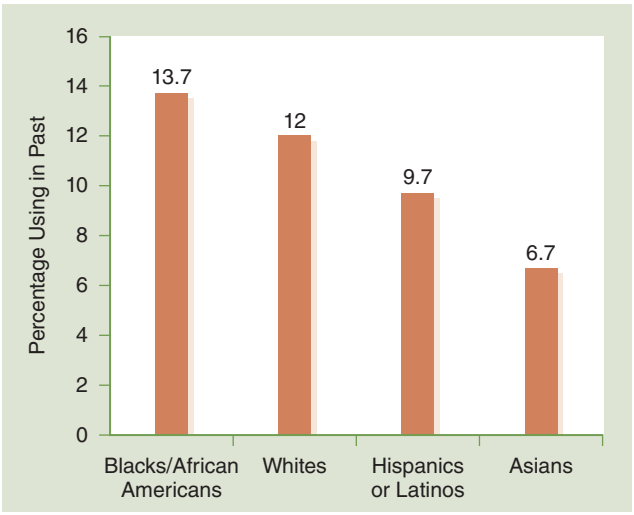


FIGURE 1.6 Past-month illicit drug use among persons age 12 or older, by race or ethnicity: 2018.

Reproduced from Substance Abuse and Mental Health Services Administration (SAMHSA). (2019). *Results from the 2018 National Survey on Drug Use and Health: Detailed tables*. Rockville, MD: Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA). Retrieved from https://www.samhsa.gov/data/

- Rates of alcohol, drug, and tobacco use are lower among pregnant women than nonpregnant women (SAMHSA, 2015).

EDUCATION: COLLEGE VERSUS NONCOLLEGE STUDENTS

- Illicit drug use rates in 2017 and 2018 were correlated with the educational status of adults 18 and older. The rate of past-month illicit drug use was lower among college graduates (9.2%) than among those with some college or associate degree education (12.4%), high school graduates with no further education (12.4%), and those who had not graduated from high school (11.4%) (SAMHSA, 2019b).
- Among full-time college students 18 to 22 in 2013, the rate of current illicit drug use was 9.4% for Asians, 19.7% for blacks, 21.5% for Hispanics, and 25.1% for whites.

ETHNICITY AND RACE

- Past-month illicit drug use rates in 2018 were correlated with ethnicity and race for persons 12 and older. Illicit drug use from highest to lowest percentages having used illicit drugs: people having two or more races, 17.6%; blacks or African Americans, 13.7%; whites, 12.0%; Hispanic or Latino, 9.7%; and Asians, 6.7% (SAMHSA, 2019b).
- The current illicit drug use rate for blacks or African Americans, whites, Hispanics or Latinos, and Asians increased from 2017 to 2018. (Latest published findings in the breakdown of illicit drugs among Hispanic groups indicates that Puerto Ricans were the heaviest users of illicit drugs, followed by Mexican Americans and Cuban Americans. Central and South Americans had the lowest current illicit drug use [SAMHSA, 2019b].)

CRIMINAL JUSTICE POPULATIONS AND ARRESTEES

Certain significant findings and correlations are unique to criminal justice populations:

- In 2013, an estimated 1.7 million adults 18 and older were on parole or other supervised release from prison at some time during the preceding year. About one-quarter (27.4%) were current illicit drug users, with 20.4% reporting current use of marijuana and 12.1% reporting current nonmedical use of psychotherapeutic drugs. These rates were higher than those reported by adults 18 and older who were not on parole or other supervised release during the preceding year (9.3% for current illicit drug use, 7.5% for current marijuana use, and 2.4% for current nonmedical use of psychotherapeutic drugs) (SAMHSA, 2014a).
- In 2013, an estimated 4.5 million adults 18 and older were on probation at some time during the previous year. More than one-quarter (31.4%) were current illicit drug users, with 23.5% reporting current use of marijuana and 12.3% reporting current nonmedical use of psychotherapeutic drugs. These rates were higher than those reported by adults who were not on probation during the preceding year (9.0% for current illicit drug use, 7.3% for current marijuana use, and 2.3% for current nonmedical use of psychotherapeutic drugs) (SAMHSA 2014a).
- "An estimated 56% of state prisoners, 45% of federal prisoners, and 64% of jail inmates have a mental health problem . . . at the time of the survey . . . conducted by the Urban Institute, . . . 49% of state prisoners, 40% of federal prisoners, and 60% of jail inmates had a symptom of a mental disorder, such as developmental and personality disorders, as well as clinical symptoms as specified in the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV)" (KiDeuk, Becker-Cohen, & Serakos, 2015).
- In 2011, 197,050 sentenced prisoners were under federal jurisdiction. Of these, 94,600 were serving time for drug offenses (Carson & Sabol, 2012).
- In 2010, Home Health Testing (2010) reported that drugs were involved in a wide range of crimes, including violent crimes (78%), property crimes (83%), weapons offenses (77%), and parole violations (77%).
- Arrestee Drug Abuse Monitoring (ADAM) reports that at the time of arrest 40% of arrestees tested positive for the presence of multiple drugs. Approximately 40% tested positive for marijuana, 30% for cocaine, and 20% for crack (National Institute of Justice, 2009). These three drugs are the most prevalent drugs that arrestees test positive for at the time of arrest. (The 2013 ADAM II report provides a comparison of the results over the years; see ONDCP, 2013a.)

■ Types of Drug Users

Just as a diverse set of personality traits exists (e.g., introverts, extroverts, type A, obsessive–compulsive, and so on), drug users also vary according to their general approach or orientation, frequency of use, and types and amounts of the drugs they consume. Some are occasional or moderate users, whereas others display a much stronger attachment to drug use. In fact, some display such obsessive–compulsive behavior that they cannot let a morning, afternoon, or evening pass without using drugs. Some researchers have classified such variability in the frequency and extent of usage as fitting into three basic patterns: experimenters, compulsive users, and *floaters* or *chippers* (members of the last category drift between experimentation and compulsive use).

Experimenters begin using drugs largely because of peer pressure and curiosity, and they confine their use to recreational settings. Generally, they more often enjoy being with peers who also use drugs recreationally. Alcohol, tobacco, marijuana, prescription drugs, hallucinogens, and many of the major stimulants are the drugs they are most likely to use. They are usually able to set limits on when these drugs are taken (often preferred in social settings), and they are more likely to know the difference between light, moderate, and chronic use.

Compulsive users, in contrast, "devote considerable time and energy to getting high, talk incessantly (sometimes exclusively) about drug use . . . [and 'funny' or 'weird' experiences] . . . and become connoisseurs of street drugs" (Beschner, 1986, p. 7). For compulsive users, recreational fun is impossible without getting high. Other characteristics of these users include the need to escape or postpone personal problems, avoid stress and anxiety, and enjoy the sensation of the drug's euphoric effects. Often, they have difficulty assuming personal responsibility and suffer from low self-esteem. Many compulsive users are from dysfunctional families, have persistent problems with the law, or have serious psychological problems underlying their drug-taking behavior. Problems with personal and public identity, excessive confusion about their sexual identity and at times sexual orientation, boredom, family discord, childhood sexual or mental abuse, academic pressure, and chronic depression all contribute to the inability to cope with issues without drugs.

Floaters or chippers initially focus more on using other people's drugs without maintaining a steady supply of drugs. Nonetheless, floaters or chippers, like experimenters, are generally light to moderate drug users. Floaters or chippers feel a largely unconscious need to seek pleasure from using drugs and the desire to relieve moderate to serious psychological problems. Even though most are on a path to drug dependence, at this stage they may generally drift between or simultaneously intermix with other experimental drug-taking peers and chronic drug-using peers. In a sense, these types of drug users feel marginally attached to conventional society and often appear to conventional members of society as norm abiding, while masking their secret drug use. At this stage, floaters or chippers are not yet firmly attached to compulsive users often because they have not made the commitment to continually do drugs. (See "Signs & Symptoms: Who Is More Likely to Use Licit and Illicit Drugs?")

■ Drug Use: Mass and Electronic Media and Family Influences

Studies continually show that the majority of young drug users come from homes in which drugs are liberally used (Goode, 1999; National Association for Children of Alcoholics, 2005; SAMHSA, Office of Applied Studies 1996). Children from these homes constantly witness drug use at home, often on a daily basis. For instance, parents may consume large quantities of coffee to wake up in the morning and other forms of medication throughout the day: cigarettes with the morning coffee, pills for either treating or

KEY TERMS

experimenters
first category of drug users, typified as being in the initial stages of drug use; these people often use drugs for recreational purposes

compulsive users
second category of drug users, typified by an insatiable attraction followed by a psychological dependence on drugs

floaters or chippers
third category of drug users; these users vacillate between the need for pleasure seeking and the desire to relieve moderate to serious psychological problems; this category of drug user has two major characteristics: (1) a general focus mostly on using other people's drugs (often without maintaining a personal supply of the drug) and (2) vacillation between the characteristics of chronic drug users and experimenter types

SIGNS & SYMPTOMS

Who Is More Likely to Use Licit and Illicit Drugs?

Many factors influence whether an adolescent tries drugs, including the availability of drugs within the neighborhood, community, and school and whether the adolescent's friends are using them. The family environment is also important: violence, physical or emotional abuse, mental illness, or drug use in the household increase the likelihood an adolescent will use drugs. Finally, an adolescent's inherited genetic vulnerability; personality traits such as poor impulse control or a high need for excitement; mental health conditions such as depression, anxiety, or ADHD; and beliefs such as drugs are "cool" or harmless make it more likely that an adolescent will use drugs (NIDA, 2014a).

According to the National Institute of Drug Abuse (2014a), adolescents experiment with drugs or continue taking them for several reasons, including the following:

- *To fit in*: Many teens use drugs "because others are doing it"—or they think others are doing it—and they fear not being accepted in a social circle that includes drug-using peers.
- *To feel good*: Abused drugs interact with the neurochemistry of the brain to produce feelings of pleasure. The intensity of this euphoria differs by the type of drug and how it is used.
- *To feel better*: Some adolescents suffer from depression, social anxiety, stress-related disorders, and physical pain. Using drugs may be an attempt to lessen these feelings of distress. Stress especially plays a significant role in starting and continuing drug use as well as returning to drug use (relapsing) for those recovering from an addiction.
- *To do better*: Ours is a highly competitive society in which the pressure to perform athletically and academically can be intense. Some adolescents may turn to certain drugs like illegal or prescription stimulants because they think those substances will enhance or improve their performance.
- *To experiment*: Adolescents are often motivated to seek new experiences, particularly those they perceive as thrilling or daring.

In addition, adolescents' years can also be preoccupied with the need to explore. They can be preoccupied with using alcohol or other drugs to do the following (DEA, 2018):

- *relieve boredom*,
- *feel good,*
- *forget their troubles and relax,*
- *satisfy their curiosity,*
- *ease their pain,*
- *feel grown up,*
- *show their independence, and*
- *belong to a specific group.*

Finally, when attempting to determine who among drug users has a greater likelihood of becoming addicted, one research finding reports, "As with many other conditions and diseases, vulnerability to addiction differs from person to person. Your genes, mental health, family and social environment all play a role in addiction" (Helpguide.org, n.d.). The following risk factors increase a person's vulnerability to addiction (Helpguide.org, n.d.):

- family history of addiction;
- abuse, neglect, or other traumatic experiences;
- mental disorders such as depression and anxiety;
- early use of drugs; and
- method of administration (smoking or injecting a drug may increase its addictive potential).

Data from National Institute of Drug Abuse (NIDA). (2014c). *Principles of adolescent substance use disorder treatment: A research-based guide*. Bethesda, MD: Author. Retrieved from https://www.drugabuse.gov/sites/default/files/podata_1_17_14.pdf; Helpguide. (n.d.). Drug abuse and addiction. Helpguide.org. Retrieved from http://www.helpguide.org/articles/addiction/drug-abuse-and-addiction.htm; Drug Enforcement Administration (DEA). (2018). Why do teens use drugs? Washington, DC: U.S Government, Drug Enforcement Administration. Retrieved from https://www.getsmartaboutdrugs.gov/family/why-do-teens-use-drugs

relieving an upset stomach, vitamins for added nutrition, or aspirin for a headache. Finally, before going to bed, the grown-ups may take a few "nightcaps" or a sleeping pill to relax. The following is an interview related to the overuse of drugs:

> Yeah, I always saw my mom smoking early in the morning while reading the newspaper and slowly sipping nearly a full pot of coffee. She took prescription drugs for asthma, used an inhaler, and took aspirin for headaches. When she accused me of using drugs at concerts, I would pick up her pack of cigarettes and several prescription bottles and while she was raging on me, I would quietly wave all her drugs close up in front of her face. She would