One of the most puzzling questions about chemical dependency is: Why can one person drink socially for a lifetime and never develop a so-called drinking problem, whereas another person will become addicted to alcohol after a very short period of social drinking? Similarly, why can most teenagers experiment with illicit drugs and then become totally abstinent, whereas some of their peers will become quickly and perhaps fatally addicted? The complexity of the addiction process is why we devote the first four chapters to theories, models, and definitions.

Chapter 1 covers the most common definitions of terms such as drug use, drug abuse, addiction, dependency, alcoholism, problem drinking, and so on. At the heart of these different definitions is the ongoing dispute about the nature of addiction: Is it a disease, a behavioral disorder, or something else? In addition, this chapter describes the major legal and illicit drugs and examines the epidemiology of alcohol and drug use.

In Chapter 2, we take a closer look at the major etiological theories of abuse and addiction (i.e., psychological, biological, and sociocultural) as well as some alternative explanations. We also present a multicausal model for the reader’s consideration in an attempt to link all the major factors that are thought to influence drug use. It is unlikely that one single factor will ever provide an explanation for abuse or dependence.
Given the amount of new research in the neurobiology of addiction, we have added a new chapter to this edition, Chapter 3, which examines the biochemistry and anatomy of the brain. Part One concludes with Chapter 4, a description of the physiological and behavioral consequences of alcohol and drug abuse. In both of these chapters, we attempt to break down some of the more common myths and stereotypes regarding addiction and addicts.
Introduction

In the first half of 2002, hospitals in the United States reported 292,098 estimated drug-related emergencies in which illegal drugs were the presenting problem and 535,646 emergency room visits in which drugs were mentioned in the report but were not the presenting problem. The most frequent reason (130,043 episodes) for an emergency department contact was an overdose, followed by a dependence problem (103,617 episodes) and a suicide or attempted suicide (95,778 episodes) (SAMHSA, 2001a).

In 1999, the 139 medical examiners in the 40 U.S. metropolitan areas participating in the same ongoing study reported 11,651 drug abuse deaths involving 29,106 drug mentions (see Tables 1.1 and 1.2). The most frequently cited drug in these reports was cocaine (4,864), followed by opiates (4,820) and alcohol in combination with other drugs (3,916). In episodes in which the manner of death was accidental, heroin and morphine were the most frequently mentioned drugs (51 percent). Among suicides, alcohol in combination (34 percent) and cocaine (24 percent) were most frequently mentioned. The total number of drug abuse deaths reported increased 15 percent between 1998 and 1999 (SAMHSA, 2000a).

Tobacco use remains the most serious substance problem in the United States, with 430,000 tobacco-related deaths annually (CDCP, 2001). According to Breslau, Johnson, Hiripi, and Kessler (2001), nicotine dependence is not only a common psychiatric disorder, but it is the leading preventable cause of death and morbidity.

Given these statistics, it is not unreasonable to say that there is an epidemic of substance disorders in the United States. In the following pages, we
will demonstrate that there are also high rates of substance use and abuse. Problems with alcohol- and drug-related overdoses and suicides are due at least in part to their widespread use among the population.

**Alcohol Use**

In the year 2000 National Household Survey on Drug Abuse (NHSDA), almost half of all Americans aged 12 or older reported being current users of al-

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**TABLE 1.1** Drugs Mentioned Most Frequently by Medical Examiners According to Race/Ethnicity of Decedent: 1999 (Drugs with fewer than 10 mentions are excluded.)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Drug Name</th>
<th>Number of Mentions</th>
<th>Percent of Total Episodes</th>
<th>Rank</th>
<th>Drug Name</th>
<th>Number of Mentions</th>
<th>Percent of Total Episodes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>White Decedents</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Black Decedents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Heroin/morphine</td>
<td>2,915</td>
<td>41.39</td>
<td>8</td>
<td>Quinine</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Alcohol-in-combination</td>
<td>2,327</td>
<td>33.04</td>
<td>9</td>
<td>Methadone</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Cocaine</td>
<td>2,257</td>
<td>32.05</td>
<td>10</td>
<td>Diazepam (Valium)</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Codeine</td>
<td>871</td>
<td>12.37</td>
<td>11</td>
<td>Amitriptyline (Elavil)</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Diazepam (Valium)</td>
<td>656</td>
<td>9.32</td>
<td>12</td>
<td>Nortriptyline</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Methamphetamine/speed</td>
<td>555</td>
<td>7.88</td>
<td>13</td>
<td>Unspec. benzodiaepine</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Marijuana/hashish</td>
<td>464</td>
<td>6.59</td>
<td>14</td>
<td>Hydantoin (Dilantin)</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Methadone</td>
<td>453</td>
<td>6.43</td>
<td>15</td>
<td>Acetaminophen (Tylenol)</td>
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<td></td>
<td>9</td>
<td>Diphenhydramine (Benadryl)</td>
<td>443</td>
<td>6.29</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>d-Propoxyphene (Darvocet N. Darvon)</td>
<td>393</td>
<td>5.58</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Hydrocodone</td>
<td>381</td>
<td>5.41</td>
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<tr>
<td></td>
<td>12</td>
<td>Amphetamine</td>
<td>377</td>
<td>5.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Amitriptyline (Elavil)</td>
<td>355</td>
<td>5.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Acetaminophen (Tylenol)</td>
<td>338</td>
<td>4.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Nortriptyline</td>
<td>324</td>
<td>4.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Black Decedents</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Hispanic Decedents</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Cocaine</td>
<td>1,937</td>
<td>64.08</td>
<td>1</td>
<td>Heroin/morphine</td>
<td>601</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Heroin/morphine</td>
<td>1,193</td>
<td>39.46</td>
<td>2</td>
<td>Cocaine</td>
<td>581</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Alcohol-in-combination</td>
<td>943</td>
<td>31.99</td>
<td>3</td>
<td>Alcohol-in-combination</td>
<td>551</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Codeine</td>
<td>343</td>
<td>11.35</td>
<td>4</td>
<td>Codeine</td>
<td>152</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Marijuana/hashish</td>
<td>141</td>
<td>4.66</td>
<td>5</td>
<td>Methamphetamine/speed</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Methadone</td>
<td>63</td>
<td>4.90</td>
<td>6</td>
<td>Methadone</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Lidocaine</td>
<td>60</td>
<td>4.67</td>
<td>7</td>
<td>Lidocaine</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Marijuana/hashish</td>
<td>52</td>
<td>4.04</td>
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<td>Marijuana/hashish</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Methadone</td>
<td>46</td>
<td>3.58</td>
<td>9</td>
<td>Diazepam (Valium)</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Amphetamine</td>
<td>42</td>
<td>3.27</td>
<td>10</td>
<td>Amphetamine</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Diphenhydramine (Benadryl)</td>
<td>39</td>
<td>3.03</td>
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<td>Diphenhydramine (Benadryl)</td>
<td>39</td>
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<td></td>
<td>12</td>
<td>Unspec. benzodiaepine</td>
<td>34</td>
<td>2.64</td>
<td>12</td>
<td>Unspec. benzodiaepine</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Phenobarbital</td>
<td>29</td>
<td>2.26</td>
<td>13</td>
<td>Phenobarbital</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Amitriptyline (Elavil)</td>
<td>28</td>
<td>2.18</td>
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<td>Amitriptyline (Elavil)</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Acetaminophen (Tylenol)</td>
<td>27</td>
<td>2.1</td>
<td>15</td>
<td>Acetaminophen (Tylenol)</td>
<td>27</td>
</tr>
</tbody>
</table>

1 Excludes data on homicides, deaths in which AIDS was reported, and deaths in which “drug unknown” was the only substance mentioned.

2 Includes opiates not specified as to type.

Note: Percentages are based on total raw medical examiner drug abuse case counts of 7,042 white decedents, 3,023 black decedents, and 1,286 Hispanic decedents.

Source: SAMHSA (2000a).
TABLE 1.2 Distribution of Drug Abuse Deaths by Selected Demographic Characteristics According to Gender: 1999

<table>
<thead>
<tr>
<th>Race/ethnicity and age</th>
<th>Number</th>
<th>Percent</th>
<th>Number</th>
<th>Percent</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8,516</td>
<td>73.1</td>
<td>5,036</td>
<td>59.1</td>
<td>1,975</td>
<td>64.1</td>
</tr>
<tr>
<td>Female</td>
<td>3,083</td>
<td>26.5</td>
<td>2,212</td>
<td>26.0</td>
<td>807</td>
<td>26.2</td>
</tr>
<tr>
<td>Unknown/no response</td>
<td>52</td>
<td>0.4</td>
<td>113</td>
<td>1.3</td>
<td>54</td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,651</td>
<td>100.0</td>
<td>8,516</td>
<td>100.0</td>
<td>3,083</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>7,042</td>
<td>60.4</td>
<td>5,036</td>
<td>59.1</td>
<td>1,975</td>
<td>64.1</td>
</tr>
<tr>
<td>Black</td>
<td>3,023</td>
<td>25.9</td>
<td>2,212</td>
<td>26.0</td>
<td>807</td>
<td>26.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1,286</td>
<td>11.0</td>
<td>1,060</td>
<td>12.4</td>
<td>221</td>
<td>7.2</td>
</tr>
<tr>
<td>Other</td>
<td>167</td>
<td>1.4</td>
<td>113</td>
<td>1.3</td>
<td>54</td>
<td>1.8</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>52</td>
<td>0.4</td>
<td>33</td>
<td>0.4</td>
<td>19</td>
<td>0.6</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>115</td>
<td>1.0</td>
<td>80</td>
<td>0.9</td>
<td>35</td>
<td>1.1</td>
</tr>
<tr>
<td>Unknown/no response</td>
<td>133</td>
<td>1.1</td>
<td>95</td>
<td>1.1</td>
<td>26</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,651</td>
<td>100.0</td>
<td>8,516</td>
<td>100.0</td>
<td>3,083</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6–17 years</td>
<td>128</td>
<td>1.1</td>
<td>84</td>
<td>1.0</td>
<td>44</td>
<td>1.4</td>
</tr>
<tr>
<td>6–11 years</td>
<td>14</td>
<td>0.1</td>
<td>9</td>
<td>0.1</td>
<td>5</td>
<td>0.2</td>
</tr>
<tr>
<td>12–17 years</td>
<td>114</td>
<td>1.0</td>
<td>75</td>
<td>0.9</td>
<td>39</td>
<td>1.3</td>
</tr>
<tr>
<td>18–25 years</td>
<td>1,008</td>
<td>8.7</td>
<td>771</td>
<td>9.1</td>
<td>232</td>
<td>7.5</td>
</tr>
<tr>
<td>18–19 years</td>
<td>198</td>
<td>1.7</td>
<td>145</td>
<td>1.7</td>
<td>52</td>
<td>1.7</td>
</tr>
<tr>
<td>20–25 years</td>
<td>810</td>
<td>7.0</td>
<td>626</td>
<td>7.4</td>
<td>180</td>
<td>5.8</td>
</tr>
<tr>
<td>26–34 years</td>
<td>2,122</td>
<td>18.2</td>
<td>1,568</td>
<td>18.4</td>
<td>538</td>
<td>17.5</td>
</tr>
<tr>
<td>26–29 years</td>
<td>792</td>
<td>6.8</td>
<td>607</td>
<td>7.1</td>
<td>178</td>
<td>5.8</td>
</tr>
<tr>
<td>30–34 years</td>
<td>1,330</td>
<td>11.4</td>
<td>961</td>
<td>11.3</td>
<td>360</td>
<td>11.7</td>
</tr>
<tr>
<td>35 years and older</td>
<td>8,355</td>
<td>71.7</td>
<td>6,069</td>
<td>71.3</td>
<td>2,263</td>
<td>73.4</td>
</tr>
<tr>
<td>35–44 years</td>
<td>4,163</td>
<td>35.7</td>
<td>3,075</td>
<td>36.1</td>
<td>1,076</td>
<td>34.9</td>
</tr>
<tr>
<td>45–54 years</td>
<td>2,951</td>
<td>25.3</td>
<td>2,176</td>
<td>25.6</td>
<td>766</td>
<td>24.8</td>
</tr>
<tr>
<td>55 years and older</td>
<td>1,241</td>
<td>10.7</td>
<td>818</td>
<td>9.6</td>
<td>421</td>
<td>13.7</td>
</tr>
<tr>
<td>Unknown/no response</td>
<td>38</td>
<td>0.3</td>
<td>24</td>
<td>0.3</td>
<td>6</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,651</td>
<td>100.0</td>
<td>8,516</td>
<td>100.0</td>
<td>3,083</td>
<td>100.0</td>
</tr>
</tbody>
</table>

1Excludes data on homicides, deaths in which AIDS was reported, and deaths in which “drug unknown” was the only substance mentioned.

2Includes episodes for which age was unknown or not reported.


In 1999, the estimated per capita consumption of alcoholic beverages by adults in the United States was 25.4 gallons, which was comprised of 22.3 gallons of beer, 1.9 gallons of wine, and 1.3 gallons of distilled spirits (U.S. Department of Agriculture, 2001).
Although heavy drinkers make up only about 10 percent of the drinking population, they account for more than half of all alcohol consumption in the United States. Heavy drinking is defined in this context as having more than two standard drinks per day for a man and more than one per day for a woman (NIAAA, 2000). However, there is no universally accepted or standard definition of the term drink (Dufour, 1999).

What is surprising is that despite the pervasiveness of health, social, and economic problems associated with the use of alcohol, experts have yet to agree on just what alcoholism really is. Is it a disease, a behavior problem, an addiction, or something completely different?

Drug Use

According to the same 2000 NHSDA, about 14 million Americans reported being current users of illicit drugs, and almost 30 percent of those 12 years or older reported using tobacco products. Another 1.5 million persons said that they used pain relievers nonmedically (SAMHSA, 2001b). A 1999 study found that 2.7 percent of eighth- and tenth-graders and 2.9 percent of twelfth-graders had used anabolic steroids (Johnston, O’Malley, & Bachman, 2000). Nearly 80 million Americans have used an illicit substance at least once in their lifetime (Sloboda, 1999).

Even though the estimated percentage of high school seniors who had used marijuana dropped in the 1990s, according to the Monitoring the Future study (Johnston et al., 2000), cocaine use remained disturbingly high. In 1995, 41.7 percent of twelfth-graders had at some time used marijuana and 6.0 percent had at some time used cocaine. In 1999, those numbers rose to 49.7 percent for marijuana use and 9.8 percent for cocaine (Johnston et al., 2000).

Generally, attention to other drugs has been focused on illicit mood-altering substances, but there is growing concern with the use of prescription drugs (such as Valium and OxyContin), over-the-counter (OTC) drugs, and drugs that have only slight mood-altering properties but present substantial health risks, such as tobacco, dietary supplements, and steroids. There are other substances that might not ordinarily be considered as drugs—inhalants and solvents (toluene, paint thinner, glue, etc.) and naturally occurring plants such as mushrooms, morning glory, and yage. Perhaps it might be more technically appropriate to speak of substances rather than drugs. On the other hand, the reasons that people generally use or abuse a particular substance are related to the specific drug contained in that substance. Tobacco is smoked because of its nicotine; khat (i.e., the leaves of a shrub used in some parts of Africa) is chewed because it contains cathinone; and mushrooms are eaten for their psilocybin (as are all psychoactive substances). Our primary focus in this book is with the most commonly used psychoactive drugs—those that alter mood, cognition, and/or behavior—whether obtained through legal or illegal means.

Definitions and Myths

Alcohol is a chemical compound that when ingested has the pharmacological property of altering the functioning of the central nervous system. Along with barbiturates and benzodiazepines, alcohol belongs to a class of chemicals called central nervous system (CNS) depressants. These drugs are used medically in the induction of anesthesia and the reduction of anxiety. They are often referred to as sedative-hypnotics. There are several different types of alcohol, but the two most common types are methyl alcohol or methanol (the type used as fuel for a car) and ethyl alcohol or ethanol (the type that is drunk). Alcoholic beverages generally consist of ethyl alcohol (C₂H₅OH), by-products of fermentation known as congeners, colorings, flavorings, and water (Levin, 1989). Beverage alcohol has been used by almost every known culture. Since any type of sugary fluid will ferment when exposed to omnipresent yeast spores, spontaneous fermentation is a common occurrence, yielding
alcohol as a readily available pharmacological substance.

Technically, cannabis is also a CNS depressant, but it is usually treated separately in texts such as this because of the magnitude of the problems associated with it. The National Institute of Justice (NIJ, 1997) estimated that Americans would spend as much as $100 billion for marijuana by the year 2000.

CNS stimulants are drugs that in small doses produce an increased sense of alertness and energy, elevated mood, and decreased appetite. Included in this group are caffeine, cocaine, amphetamines, methamphetamine, and amphetamine-like substances such as Ritalin and Preludin.

Opiates are substances such as heroin, morphine, codeine, opioids, and synthetic morphine-like substances such as pethidine, methadone, and dipipanone. Small doses will produce an effect similar to that of the CNS depressants but with somewhat less impairment of the motor and intellectual processes (Drugtext, 2001).

Hallucinogens have the capacity to induce altered perceptions, thoughts, and feelings. Lysergic acid diethylamide (LSD), mescaline, and “magic mushrooms” (which contain the ingredient psilocybin) all produce these effects. Volatile solvents such as gasoline, benzene, and trichlorethylene can also produce effects similar to CNS depressants and hallucinogens when their vapor is inhaled (Drugtext, 2001).

Disease, Addiction, or Behavioral Disorder?
The major definitional issue concerning chemical dependency is whether it is a bad habit, a disease, or a form of moral turpitude. It has been variously described as a product of the genes, the culture, the devil, and the body. Disagreement persists among professional groups as well as the public at large. The various definitions of addiction are frequently driven by political motives, ideology, personal interest, and professional training. We will have much more to say about the nature of addiction throughout this chapter. The major reason for concern is that appropriate and effective treatment of addiction must be predicated on a reasonably accurate description of the etiology of the phenomenon. Practitioners cannot effectively diagnose or treat that which they cannot define. The best that they can do is deal with the outward symptoms of the problem.

The reader may have noticed terms in the chemical dependency literature have not been precisely defined—terms such as alcoholism, addiction, use, misuse, abuse, dependency, and problem drinking. Such terms are more often used as descriptions of a state of affairs rather than explanations of these phenomena, and there are considerable variations in the meanings attached to these terms by different writers. We will do the best we can in the following pages to define these terms; however, there will still be some ambiguity. Problems and abuse frequently exist only in the eye of the beholder.

We are also concerned that when the term disease is used in a metaphorical sense, it may actually make treatment more problematic, especially when the metaphoric aspect is forgotten—as it usually is. If a phenomenon is a disease, then we expect a cure in the form of a drug or other medical treatment. Over the years, poverty, pornography, obesity, family violence, and “gangsta rap” have all been portrayed as diseases. It is doubtful that the disease label has helped to facilitate a so-called cure for any of these conditions. The origins of the disease model of addiction have their roots in Alcoholics Anonymous (AA) (Yalisove, 1998).

Alcoholism and drug addiction also are frequently regarded as family diseases. The implication is that chemical dependency impacts the family system. We will discuss this idea at some length in Chapter 10. Whether it is a disease or not, there is little doubt that chemical dependency dramatically affects not only the family but also all other systems of which the family is a subsystem or with which families interact, such as the school and the workplace.
Alcoholism is one of those peculiar phenomena for which every layperson usually has his or her own working definition; many think an alcoholic is “anyone who drinks more than I do.” However, the layperson’s definition of alcoholism usually does not differentiate alcohol abuse and alcohol dependence. Professionals working in this field do need to make these distinctions and perhaps even finer ones. One astute observer commented that it makes about as much sense to treat all alcoholics alike as to treat all persons having a rash alike. Imagine visiting the “rash ward” at your local hospital!

Contemporary scholars of alcoholism owe much to the earlier contributions of Jellinek and Bowman, who insisted that there were important differences between chronic alcoholism and alcohol addiction. The former was described as including all physical and psychological changes resulting from the prolonged use of alcoholic beverages. The latter was described as a disorder characterized by an urgent craving for alcohol (Bowman & Jellinek, 1941). According to their model, chronic alcoholism could exist without addiction, and addiction could occur without chronic alcoholism. Jellinek is usually identified as the most important researcher in making the disease concept of alcoholism scientifically respectable, but he also identified five separate types of alcoholism, thus demonstrating that the disease model was not a clear, unitary concept (Jellinek, 1960).

According to Jellinek, alpha alcoholics use alcohol to relieve physical or emotional pain more frequently and in greater amounts than is used under normal social rules. Beta alcoholics drink heavily and experience a variety of health and social problems because of their drinking, but they are not addicted to alcohol. Gamma alcoholics are characterized by loss of control over the amount consumed and by increased tissue tolerance to alcohol, adaptive cell metabolism, withdrawal symptoms, and craving. Delta alcoholics are similar to the gamma type, but they do not lose control over the amount consumed even though they cannot abstain from continuous use of alcohol. Epsilon alcoholics are similar to gammas but are binge or periodic drinkers (Jellinek, 1960).

It should be noted that Jellinek’s research was based on a questionnaire designed by members of AA, distributed in the AA magazine The Grapevine, and completed by only 98 AA members. It could be very misleading to assume that all alcoholics would fall into the same patterns as these AA members (McKim, 1991, p. 105). In his book The Disease Concept of Alcoholism, Jellinek (1960) also noted that a disease is anything the medical profession agrees to call a disease.

The World Health Organization (WHO, 1952) first defined alcoholism as “a chronic behavioral disorder manifested by repeated drinking of alcoholic beverages in excess of the dietary and social uses of the community and to the extent that it interferes with the drinker’s health or his social or economic functioning” (Keller, 1958, pp. 1–11). This definition, stressing cultural deviance and damage to the drinker, avoided the alcoholism-as-a-disease controversy. The WHO also distinguished between alcohol addicts and symptomatic drinkers. The latter group were described as similar to Jellinek’s beta alcoholics.

The WHO (1952) committee on alcohol-related disabilities subsequently published a report endorsing the use of the term alcohol dependence syndrome. The use of this term suggests that a number of clinical phenomena occur with sufficient frequency to constitute a recognizable pattern, but the different elements are not always expected to appear with the same magnitude or frequency. The following are features of alcohol dependence syndrome:

1. Regularity in the repertoire of drinking behavior
2. Emphasis on drink-seeking behavior
3. Increased tolerance to alcohol
4. Repeated withdrawal symptoms
5. Repeated relief or avoidance of withdrawal symptoms by further drinking
6. Subjective awareness of a compulsion to drink
7. Reinstatement of the syndrome after periods of abstinence (Mandell, 1983)
The WHO’s current thinking about substance dependence, including alcohol dependence, seems to have embraced the disease model. Specifically, dependence “is a brain disorder and people with drug dependence have altered brain structure and function” (WHO, 2001, p. 2).

A committee of medical authorities commissioned by the National Council on Alcoholism and Drug Dependence (NCADD) in the 1970s developed a set of guidelines to facilitate the diagnosis and evaluation of alcohol dependence at multiple levels. The criteria that were developed consisted of 86 symptoms grouped into three major diagnostic levels, with each level divided into separate tracks based on physiologic symptoms, behavior, and attitudes (National Council on Alcoholism, 1972). An experimental evaluation of the use of these criteria on 120 male alcoholics concluded that 38 items did not differentiate between alcoholics and nonalcoholics and that only 4 items explained 90 percent of the variance between the two groups. These items were gross tremor, regressive defense mechanisms, morning drinking, and blackouts (Ringer et al., 1977).

As we mentioned earlier, a major issue in defining chemical dependency is whether it is a disease. Medical professionals tend to define both alcoholism and drug addiction as diseases, but professionals with other types of backgrounds are not usually so sure. However, Vaillant (1983, p. 15) points out quite clearly that members of the medical community are not united in their conceptualization of alcoholism. In the early 1980s, about 85 percent of general practitioners agreed that alcoholism was a disease, whereas only 50 percent of medical school faculty considered alcoholism (or coronary thrombosis, hypertension, and epilepsy) a disease.

Pattison, Sobell, and Sobell (1977) feel that alcoholism is a collection of various symptoms and behaviors related to the inappropriate use of alcohol with harmful consequences. In other words, describing a person as an alcoholic is no more useful than describing someone as having a cough. Pattison and colleagues argue that there is no single factor that explicitly defines and delineates alcoholism and that there is not a clear dichotomy between alcoholics and nonalcoholics. Furthermore, the sequence of appearance of adverse symptoms associated with drinking is highly variable, and there is no conclusive evidence to support the existence of a specific biologic process that predisposes a person toward alcoholism. Their most controversial assertion, however, is that for many supposed alcoholics, alcohol problems are reversible. In other words, some alcoholics may safely return to social drinking. This clearly puts Pattison and colleagues at odds with the majority of alcoholism professionals as well as with AA, which regards alcoholism as an incurable illness for which recovery is possible only through total abstinence (Curlee-Salisbury, 1986).

The current criteria of the American Psychiatric Association (APA) in its Diagnostic and Statistical Manual of Mental Disorders, or DSM (4th ed., text revision) distinguish between substance abuse and substance dependence. Both are classified as substance use disorders, but the word disease is not mentioned. Substance abuse is defined as “a maladaptive pattern of substance use leading to clinically significant impairment or distress” (APA, 2000, p. 199). This pattern must be manifested by one or more of the following behaviors within a 12-month period:

1. Recurrent substance use resulting in a failure to fulfill major role obligations
2. Recurrent substance use in situations in which it is physically hazardous
3. Recurrent substance abuse legal problems
4. Continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance

Substance dependence is defined in the same manner as a “maladaptive pattern of substance use, leading to clinically significant impairment or distress” (APA, 2000, p. 199). However, three or more
of the following behaviors must be manifested within a 12-month period:

1. Tolerance, as defined by either
   a. a need for markedly increased amounts of the substance to achieve intoxication or desired effect
   b. markedly diminished effect with continued use of the same amount of the substance
2. Withdrawal, as manifested by either
   a. the characteristic withdrawal syndrome for the substance
   b. the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms
3. The substance is often taken in larger amounts or over a longer period than intended
4. There is a persistent desire or unsuccessful efforts to cut down or control substance use
5. A great deal of time is spent in activities necessary to obtain the substance
6. Important social, occupational, or recreational activities are given up or reduced because of substance use
7. The substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problems that is likely to have been caused or exacerbated by the substance

Not all use of a drug should be classified as abuse or dependence. If a person is using a drug without harming himself or herself or others, then it is simply drug use. The differentiation between use and abuse has important implications. If one has no moral or religious objections, drug use per se would not seem to be a bad thing. However, if the user is damaging himself or herself or others, drug use becomes abuse. (The reader should remember that society has legalized the use of two major drugs, alcohol and tobacco, even though both frequently lead to abuse and dependence.)

If chemical dependency is a disease, is it a physical, emotional, or mental disease? How does one “catch” or “get” it? Is it transmitted by certain genes? Is there a physiological pathology that leads to alcoholism? There is a vast literature devoted to these and similar questions, but it is likely to be more confusing than enlightening to most readers, and the questions are likely to remain unanswered. (A more comprehensive discussion of etiology is found in Chapter 2, and Chapter 3 addresses neurobiological models of addiction.) Some of the most interesting and convincing evidence for the disease model comes from the studies of genetically identical (i.e., monozygotic) twins.

Kaij (1960) studied 174 male twin pairs in Sweden and discovered a 54 percent concordance for alcoholism in one-egg twins versus a 28 percent concordance for alcoholism in two-egg twins. Since both types of twins were raised within the same social environment, it is assumed that any differences in rates of concordance between the two types of twins are the result of genetic factors. However, in a recent longitudinal study of children of alcoholics, Harburg, Difrancesco, Webster, Gleiberman, and Schork (1990) found a much weaker relationship between their drinking and their parents’ drinking problems. This issue is unlikely to be resolved in the near future.

There is no doubt that cirrhosis, pancreatitis, Korsakoff’s psychosis, and any other such effects that are a result of excessive drinking can properly and indisputably be called diseases. However, these are diseases that result from drinking. The debate concerns the etiology of alcoholism, and that is where we turn our attention in the subsequent sections of this chapter as well as in Chapter 2.

Is there an identifiable disease called alcoholism that causes a person to engage in excessive and inappropriate drinking? As important a question as this would seem to be, some contemporary scholars of alcoholism see this debate as a rather futile and useless waste of energy. Levin (1989) argues that any behavior as dysfunctional and self-destructive as alcoholism is a disease, regardless of etiology. “For an organism to destroy itself is pathological, regardless of the source of the pathology” (p. 63).
The same arguments concerning the disease concept of alcoholism are found in the literature on addiction to other drugs, as well. Psychiatrists hold many different opinions about the relationship between drug abuse and disease or mental illness. The most consistent opinion is that several different forms of physical disease or mental illness may result from drug abuse (Raistrick & Davidson, 1985).

Substance dependence is not described by the APA (2000) as an all-or-nothing condition but one that exists in varying degrees. There is no attempt to weigh or prioritize the syndrome components, and not all of them need to be present for a person to be labeled dependent.

As with alcoholism, proponents of the disease model of drug addiction can neither demonstrate a clear etiology for addiction nor predict its course or symptoms with any accuracy. It has even been suggested that the disease model is an elaborate and sinister hoax (Krivanek, 1988a, pp. 31–38). An important reason for labeling alcoholism and drug addiction as diseases is that it seems to reduce or alleviate the guilt or stigma associated with addiction and to make medical resources available for treatment. The recent decriminalization of public intoxication was undoubtedly related to the acceptance of the disease model.

Although most people view these events as improvements, we must allow the possibility that the disease model may also serve as an impediment to scientific research and to effective treatment. As we will discuss later in Chapter 6, the “track record” in providing effective treatment to chemically addicted clients is not impressive.

Epidemiology

Alcohol

There is evidence that alcohol use was widespread by the Neolithic Age. Stone pots dating from the old Stone Age in Clairvoux, Switzerland, have been discovered that once contained beer or wine. Ancient civilizations of the Near East, India, and China made copious use of alcohol. In addition, myths frequently depicted alcohol as a gift from the gods. Some societies even worshipped specific gods of wine: Osiris (Egypt), Dionysius (Greece), and Bacchus (Rome). Priests, too, frequently used alcohol as a part of religious rituals (Levin, 1989).

The consumption of alcohol spread from ritual use to convivial use, and before long, it was a regular part of meals. For example, the Assyrians received a daily allotment of bread and barley beer from their masters, and bread and wine were used by the Hebrews after a successful battle. By the Middle Ages, alcohol was an important staple in the diet and was used to celebrate births, marriages, coronations, diplomatic exchanges, and the signing of treaties.

Beverage alcohol came to the New World with the explorers and colonists. The Mayflower landed at Plymouth Rock because, according to the ship’s log, “We could not now take time for further search or consideration, our victuals having been much spent, especially our bere” (Kinney & Leaton, 2000, p. 4). Spanish missionaries brought grapevines to America and were making wine in California before the United States was a nation. In 1640, the Dutch opened the first distillery of the New World (in what is known today as Staten Island, New York). Jamaican rum became the most popular drink in America under British rule, with New England bankers financing the slave trade that was used to produce the molasses needed to make rum. After the American Revolution, the preference for rum was eventually replaced by one for sour-mash bourbon whiskey (Rorabaugh, 1979).

Drinking in the United States was largely a family affair until the beginning of the nineteenth century. With increasing immigration, industrialization, and greater social freedom, alcohol use (and abuse) became more open and more destructive. The opening of the American West brought the saloon into prominence, with the frontier hero gulping his drinks as his foot rested on the bar rail (Kinney & Leaton, 2000).

During the 1820s, the founders of the Temperance movement sought to make Americans
into a clean, sober, godly, and decorous people whose values and life-styles would reflect the moral leadership of New England federalism. In the next few decades, abstinence became a symbol of middle-class membership and a way to distinguish the ambitious and aspiring from the ne’er-do-well, the Catholic immigrant from the native Protestant, gradually losing its association with the New England upper classes and becoming democratized. By the 1850s, Temperance was allied with Abolition and Nativism to form a trio of major movements (Gusfield, 1988).

Threatened by increasing urbanization, political defeats in both the North and the South, and a steady flow of Catholic immigrants, the Populist wing of the Temperance movement adopted a theme of coercive reform. With the development of the Anti-Saloon League in 1896, reform pitted traditional rural Protestant society against urban Catholicism and industrialism, culminating in 1919 in that grand experiment known as Prohibition. Since the repeal of the Eighteenth Amendment in 1933, the Temperance movement generally has been fighting a losing battle. Today, so-called dry counties and precincts are rare, and even Protestant churches and respectable, upper-middle-class citizens can safely be counted on to support abstinence.

Estimating the prevalence of alcohol abuse, problem drinking, or whatever else we may choose to call it is very difficult. The first and most obvious difficulty is that there is no widely accepted definition of just what kind of drinking behavior constitutes a problem. Next, as all experienced researchers know, the choice of investigative method may be the overriding factor in arriving at an estimate of this phenomenon. It is widely assumed that most respondents underreport their actual alcohol consumption, either because they do not know or remember how much they drink or because they fear that their admitted use may seem excessive.

The first national survey of the prevalence of drinking problems was conducted in 1967 (Calahan & Roizen, 1974). Using Plaut’s (1967) definition of problem drinking as “repetitive use of beverage alcohol causing physical, psychological, or social harm to the drinker or to others,” 15 percent of the men and 4 percent of the women in the samples were judged to have a problem with alcohol. Another interpretation of the data viewed 43 percent of the men and 21 percent of the women as having experienced some degree of problem drinking at some time within the preceding three years (Calahan & Cisin, 1976, p. 541). A more recent study has reported that 16 percent of males and 6 percent of female drinkers disclosed personal problems associated with alcohol use (Malin, Wilson, Williams, & Aitken, 1986, pp. 56–57).

Using criteria from the DSM (3rd ed., rev. APA, 1987) Grant and colleagues (1991) administered the National Health Interview Survey (NHIS) to estimate an alcohol dependence rate within the preceding year of 8.63 percent in the general population. White males aged 30 to 45 were found to have the highest rate (26.14 percent). For nonwhite males, the rate was 9.29 percent; for nonwhite females, 2.50 percent. The rate for all men was 13.35 percent, and for all women, it was 4.36 percent. The rate for white women was slightly higher, at 4.68 percent.

As we mentioned earlier, almost half (46.2 percent) of all Americans aged 12 or older reported current alcohol use (i.e., having at least one drink in the past 30 days) in the 2000 NHSDA. Of those persons, over one-fifth (20.6 percent) participated in binge drinking (i.e., having five or more drinks on the same occasion at least once in the previous 30 days) and 5.6 reported being heavy drinkers (having five or more drinks on the same occasion at least five different times in the past 30 days) (SAMHSA, 2001b). This means that 104 million Americans use alcohol, 46 million are binge drinkers, and 12.6 million are heavy drinkers.

Age. Alcohol use, heavy use, and binge drinking peak at age 21. In 2000, the reported use of alco-
hol increased with age from 2.4 percent at age 12 to 65.2 percent at age 21. After age 21, there is a steady pattern of alcohol use, with a decline in binge drinking and heavy drinking. There were also 9.7 million underage drinkers in 2000 (27.5 percent of persons aged 12 through 20), 6.6 million underage binge drinkers (18.7 percent), and 2.1 million underage heavy drinkers (6.0 percent). Binge drinking increased from 1.0 percent for age 12 to 3.0 percent for age 13 (SAMHSA, 2001b).

**Gender.** More males than females use alcohol, with 53.6 percent of males and 40.2 percent of females aged 12 years or older reporting current use in 2000. However, among the 12- to 17-year-old age group, females (16.5 percent) were more likely to drink than males (16.2 percent). Males in the 12- to 20-year-age group were more likely to binge drink than females (21.3 percent compared to 15.9 percent).

Perhaps the most disturbing statistic from the NHSDA on female drinking, given the problem of fetal alcohol syndrome (see Chapter 15), is that 12.4 percent of women of childbearing age (i.e., 15 to 44) use alcohol and 3.9 percent are binge drinkers (SAMHSA, 2001b). While alcohol use for women in this age group is generally no more problematic than that for men, women who plan to become pregnant should carefully consider their use of alcohol.

**Race/Ethnicity.** Whites (50.7 percent) are more likely than people from any other racial or ethnic group to report the current use of alcohol. In 2000, among persons of mixed race, 41.6 percent reported alcohol use in the past 30 days. The rate for Hispanics was 39.8 percent; for Native Americans, 35.1 percent; for African Americans, 33.7 percent; and for Asian Americans, 28.0 percent. Binge drinking was most often reported by Native Americans (26.2 percent) and least often by Asians Americans (11.6 percent). Differences in alcohol and drug use among racial/ethnic groups are explored in detail in Chapter 11 (SAMHSA, 2001b).

**Education.** The rate of current alcohol use increases with level of education. In 2000, 63.2 percent of college-educated adults reported drinking compared to only 33.9 percent of adults without a high school education. However, education is associated with lower rates of binge drinking and heavy drinking. Persons aged 18 to 22 enrolled full time in college were more likely than others in this age group to report alcohol use (62.0 to 50.8 percent), binge drinking (41.4 to 35.9 percent), and heavy drinking (16.4 to 12.1 percent). One-half of all male college students and one-third of all female college students reported binge drinking (SAMHSA, 2001b).

**Geographic Area.** The reported use of alcohol was lowest in the South (33.7 percent) and highest in New England (59.3 percent). It was also lower in rural areas (35.6 percent) than in large metropolitan areas (50.1 percent). However, there were some interesting differences among subgroups within geographic areas. For example, among young adults aged 18 to 25, the rate of heavy drinking was the same in both metropolitan and rural areas, but for older adults (aged 26 or older), heavy drinking was higher in rural areas (SAMHSA, 2001b).

**Illicit Drugs**

About 14 million Americans—6.3 percent of the population aged 12 or older—reported using an illicit drug in the previous 30 days in the 2000 NHSDA (SAMHSA, 2001b). Marijuana was the most commonly used illicit drug, used by 76 percent of illicit drug users. About 59 percent of illicit drug users used marijuana only. 17 percent used another illicit drug and marijuana, and 24 percent used an illicit drug other than marijuana. The majority of those using illicit drugs other than marijuana (5.7 million users) were using psychotherapeutics nonmedically. These drugs include pain relievers (2.8 million users), tranquilizers (1.0 million users), stimulants (0.8 million users), and sedatives (0.2 million users) (SAMHSA, 2001b).
Marijuana. Marijuana was a legal drug and was grown as a cash crop in parts of the United States until its use and possession were prohibited by federal law in 1937. (It is still an important but illicit cash crop in many states today.) The plant was probably brought into Texas and California by Mexican immigrants in the early part of the twentieth century. Marijuana smoking was commonly accepted in many Mexican communities as a relaxant, a remedy for headaches, and a mild euphoriant. Cultivation of the plant was a major industry in the area around Mexico City and in several of the provinces, and it extended rapidly to border towns such as Laredo, El Paso, and Nogales. A direct railroad link between Mexico City and San Antonio facilitated marijuana trade between those cities, and for a while, a druggist in Floresville, Texas, established a mail-order marijuana business with customers in Texas, Arizona, New Mexico, Kansas, and Colorado (Bonnie & Whitebread, 1988).

Smoking marijuana spread quickly to New Orleans, where it was popular among many African American jazz musicians by the early 1920s (Goode, 1969). They carried it with them as they immigrated to the urban centers of the North. Anecdotal accounts of its history indicate that marijuana was soon adopted by many so-called deviant groups: professional criminals, prostitutes, and so on. In the 1960s, it became one of the symbols of the hippie movement (Kelleher, MacMurray, & Shapirof, 1988, p. 249). Very few hard data exist regarding its use until the mid 1970s, however.

Cannabis is generally regarded as the most commonly used illicit drug. During the 1970s, 16 million Americans used marijuana at least once a month, of whom about 4 million were between 12 and 17 years of age and 8.5 million between 18 and 25 years of age (Executive Office of the President, 1978). Marijuana use seems to have peaked between 1979 and 1981, with more than 10 percent of high school seniors being daily users. By 1986, daily use by this group had dropped to 4 percent (Johnston, O’Malley, & Bachman, 1987). By 1988, it had dropped further to 3.3 percent (4.5 percent for males and 2.2 percent for females) (Johnston et al., 1987). By 1995, 4.6 percent of seniors were using marijuana daily (Drug use, n.d.).

In 1999, the number of seniors using marijuana daily was 6.0 percent (Johnston et al., 2000). A 1999 estimate by the National Institute on Drug Abuse (NIDA) put the total percentage of the U.S. population who had ever used marijuana at 34.6 percent. This rate was highest for the 18-to 25-year-old age group (46.8 percent). In the population aged 26 or older, 34.7 percent had used this drug. In a study of high school seniors in the class of 1995, 49.7 percent had reportedly used marijuana at some time (SAMHSA, 2001b).

According to the Office of National Drug Control Policy (ONDCP, 2001), the availability of marijuana is stable through most regions of the United States. The most widely available form of outdoor-grown marijuana (“bio”) is commercial grade, with a tetrahydrocannabinol (THC) content of 4 to 15 percent. Sinsemilla, a seedless variety with from 5 to 30 percent THC, was available in only about one-third of the reporting areas. Hydroponic marijuana (“hydro”) can be even more potent than sinsemilla and is available in most metropolitan areas. In 2000, prices of commercial-grade marijuana varied from $20 per ounce in Birmingham, Alabama, to as much as $500 per ounce in Los Angeles, California, and Sioux Falls, South Dakota. Sinsemilla was selling for $40 per ounce in El Paso, Texas, and $1,000 to $2,000 per ounce in Los Angeles.

Narcotics. Opium, morphine, codeine, and heroin are the major drugs included in the category of narcotics. They are derived from the variety of poppy known as papaver somniferum. Under federal law, cocaine is classified as a narcotic, but it is actually a stimulant (see next section). Narcotics have the effect of depressing the activity of the brain and the central nervous system.

The earliest reference to opium is a Sumerian idiogram dated about 4000 B.C., referring to it as
“joy plant.” Hippocrates and Pliny both recommended the use of opium for a number of conditions. Since it was not banned in Muslim countries, Arab traders carried it from the Middle East to India, China, and finally Europe. By the early sixteenth century, it was prescribed by physicians throughout Europe. By 1875, the British consumption rate for opium was 10 pounds per 1,000 population (McKim, 1991).

Before 1900, opium was available in the United States as an ingredient in a number of prescription drugs such as laudanum and “black drop.” It was also available in a number of patent medicines. It had a relatively mild psychological effect when taken by mouth, and it was freely prescribed by physicians.

Morphine, an opiate, was found to be an exceptionally effective painkiller, and it came into common medical usage during and after the Civil War. The importation of opium continued to rise and finally peaked in 1896. Smoking opium, which had no medicinal value, was banned in the United States in 1909 (Musto, 1973). The Harrison Act made it illegal for physicians to prescribe morphine and opium to addicts in 1914 and made addiction to opiates a crime. Heroin, which had not been discovered until 1898, soon became a substitute for morphine users. This loophole was closed when Congress finally banned all opiate use, including heroin, in 1924 (McKim, 1991). Heroin addiction continued to climb, however, until 23 of every 10,000 Americans were addicted in 1978 (Wilker, 1980). In 2000, about 130,000 persons identified themselves as current heroin users (SAMHSA, 2001b).

Both morphine and opium addiction have at times posed serious problems in the United States, but today, heroin is regarded as the most dangerous of all existing narcotics. Heroin can be smoked, snorted, injected under the skin (“skin-popping”), or injected directly into a vein (“mainlining”). In the mainlining case, there is an imminent danger of overdosing or contracting the human immunodeficiency virus (HIV) from the use of dirty needles (Desjarlais & Friedman, 1988).

Heroin use has long been associated with deviant groups such as criminals, prostitutes, jazz and rock musicians, and poor African Americans living in the ghettos of large urban centers (Stewart, 1987). However, many veterans of the war in Vietnam returned home addicted to heroin (Krivanek, 1988b).

One of the most controversial opioids today is OxyContin, a synthetic form of morphine. Recent media reports have focused on the abuse of this drug, but little is known about the true incidence of abuse. It is thought to be localized in Appalachia and parts of the Midwest (see Chapter 4).

**Stimulants.** Cocaine made its way into the United States from Latin America but with a very different history from that of marijuana. Coca leaves have been found in burial middens in Peru that date back to 2500 B.C. Under the Incas, coca became sacred and was used primarily by priests and nobility for special ceremonies. Widespread daily use of the coca leaf did not appear until the Spanish conquest, when it was used to pay for labor in the gold and silver mines in the Andes. The Spanish soon discovered that the Indians could work harder and longer and required less food if they were given coca (McKim, 1991).

Samples of the plant were sent to Europe in 1749, but the anesthetic effects of cocaine were not discovered until 1862. By 1884, it was in widespread use as a local anesthetic for the eye. In 1885, Sigmund Freud delivered a lecture based on his observations of the effects of cocaine on mood and behavior (Imlah, 1989). The use of cocaine was a common theme in the literature of the day, with such popular heroes as Arthur Conan Doyle’s Sherlock Holmes favoring a “seven percent solution.” (Holmes once mysteriously disappeared for three years and returned to his Baker Street residence cured of his cocaine addiction.)

In addition to its legitimate medical uses, cocaine was an ingredient in patent medicines and beverages such as Coca-Cola until the passage of the Harrison Tax Act of 1914. Coca-Cola now
uses only the decocainized coca leaves as a flavoring agent (Cohen, 1981).

The rediscovery and reintroduction of cocaine to modern American culture is sometimes attributed to the rock musicians of the 1960s. Until recent years, the form of cocaine generally available for illicit use in the United States was the white, bitter-tasting, crystalline powder of cocaine hydrochloride. It could be smoked or injected but was most commonly snorted (i.e., ingested intra-nasally). More recently, another more dangerous form of cocaine, called crack, has come into use. It is made by cooking the powder with baking soda to remove its impurities. The resulting product is smoked and provides a much more rapid and intense “high” (Imlah, 1989). Unfortunately, most statistics on cocaine use have only recently distinguished cocaine powder from crack cocaine. However, in 2000, some 1.2 million Americans reported having used cocaine, and that included 265,000 crack users (SAMHSA, 2001b).

In general, amphetamines have an effect similar to cocaine but with a slower and less dramatic action. An amphetamine is a synthetic stimulant synthesized in 1927 as a replacement for ephedrine, a common ingredient in asthma, cold, and hay-fever remedies. Drinamyl, for many years the most widely prescribed drug for symptoms of anxiety and depression, was a combination of amphetamine and barbiturates. Amphetamines were widely used in World War II for keeping the troops alert and overcoming fatigue. During the 1960s, many people unknowingly became addicted to a Benzedrine inhaler sold without a prescription for the treatment of colds, allergies, and sinusitis. Until new rules were adopted by the Food and Drug Administration in 1970, many others became addicted while using amphetamine-based diet pills (Imlah, 1989). Amphetamines were also widely used in the 1960s and 1970s in both amateur and professional sports. One report in 1978 revealed that 75 of 87 professional football players interviewed admitted using speed, a common name for amphetamines (Cooter, 1988, pp. 37–40).

Ice, a particularly strong and dangerous form of amphetamine, appeared in Hawaii and California in the early 1990s and rapidly spread to other parts of the country. Although the data are largely anecdotal at this point, ice seems to be responsible for an alarmingly high number of hospital emergency room admissions (Lerner, 1989, pp. 37–40). No separate national statistics of use are kept for this particular drug.

The most commonly used stimulant, caffeine, is found in coffee, tea, and certain soft drinks. Although withdrawal effects are not uncommon, caffeine does not ordinarily present a threat to health or an impairment to functioning. For this reason, we will not devote much space to it in this text.

Methylphenidate (Ritalin) is still widely sought after by narcotic addicts maintained on methadone injections, since methadone has no antagonist effect on amphetamines. Statistics on its use are not available, but it does not seem to constitute a serious problem (Imlah, 1989). (Ritalin is a drug commonly prescribed to control attention-deficit/hyperactivity disorder [ADHD] in children.)

Results of a 1999 NIDA survey showed that 7.3 percent of adults aged 26 or older report using a stimulant (other than caffeine) at some time during their lives (SAMHSA, 2000a).

Rates of Illicit Drug Use. There were no statistically significant changes in the rates of use in the major illicit drug categories between the 1999 and the 2000 NHSDA surveys. The use of new so-called club drugs has continued to grow, however. About 6.4 million persons have now tried ecstasy at least once (SAMHSA, 2001b).

As with marijuana, the purity of illicit drugs varies widely, with rates of 25 percent purity for powder cocaine common in Honolulu and 90 percent in Boston and Miami. Purity and price seem to have very little in common, with lower-grade cocaine selling for $100 to $200 per gram in Honolulu and higher-grade selling for $40 to $60 per gram in Miami.
High-grade cocaine powder could be purchased for $30 per gram in Seattle. Crack cocaine varied from $20 per gram in Seattle and Miami to $250 in Honolulu. In New York City, a gram of 75 percent pure crack could be purchased for an average price of $28 (ONDCP, 2001). The popularity and availability of a drug in any specific community, as well as the degree of competition between drug-marketing organizations, are more likely to determine price.

In a recent study by the ONDCP (2001), heroin was perceived to be the most serious illicit drug problem in about 8 percent of the reporting cities and the second most serious problem in 20 percent of those cities. Colombian white and Mexican black tar heroin were the most common types available. Mexican black tar of only 25 percent purity could bring $300 a gram in Los Angeles, but higher-quality Mexican black tar sold for under $100 per gram in El Paso and Seattle. Colombian white heroin of 70 to 75 percent purity sold for as much as $300 per gram in Philadelphia and as little as $75 per gram in New York (ONDCP, 2001).

Data analogous to those for rates of heavy drinking and binge drinking are not collected for illicit drugs, but there are other ways to estimate the extent of problematic drug use. As mentioned earlier in this chapter, U.S. hospitals reported 292,098 drug-related emergency department episodes in the first half of 2000 and more than half a million episodes in which drugs were mentioned (SAMHSA, 2001a). Cocaine is the most frequently mentioned illicit drug in emergency department reports (81,361 mentions) with marijuana/hashish second (47,535 mentions), and heroin/morphine a close third (47,008 mentions). Heroin/morphine mentions increased 22 percent from the first half of 1999 to the first half of 2000.

These hospital data indicate that drug use trends can be highly localized, since heroin/morphine mentions increased in 8 of the 21 metropolitan areas sampled, decreased in 1, and remained about the same in all the rest (SAMHSA, 2001a). Even greater changes were found among other drugs. Cocaine mentions during the same period increased 47 percent in San Francisco, and methamphetamine/speed mentions increased 80 percent in Seattle, 71 percent in San Diego, and 67 percent in Phoenix.

Age. As with alcohol use, the rate of illicit drug use increases with age, peaking in the 18- to 20-year-old age group (19.6 percent) and then declining to around 2 percent for adults in their fifties. Between 1999 and 2000, use by youths aged 12 and 13 decreased from 3.9 percent to 3.0 percent, primarily because of a significant drop in inhalant use. In the year 2000 NSHDA, about 9.7 percent of youths aged 12 to 17 had used an illicit drug within the previous 30 days, about the same as in 1999 (9.8 percent). The drugs favored by 16- and 17-year-old youths were marijuana (13.7 percent), psychotherapeutic drugs (4.3 percent), hallucinogens (2.3 percent), and cocaine (1.1 percent) (SAMHSA, 2001b).

Club drugs—including methylenedioxymethamphetamine (MDMA or ecstasy), gamma hydroxybutyrate (GHB), ketamine (“Special K”), and phencyclidine (PCP)—seem to be favored by teenagers and young adults, but there are few reliable national statistics on their usage, other than hospital emergency department reports. According to the Community Epidemiology Work Group (CEWG, 2001), ecstasy use has increased in 13 of its 21 reporting communities and GHB use has increased in 9 areas and decreased in 1. Ketamine and PCP reports were too sketchy to be useful.

According to the ONDCP (2001), ecstasy was seen as the most available club drug, with more than 90 percent of respondents indicating that it was either “somewhat” or “widely” available. Ecstasy prices ranged from $10 to $40 per pill (purity unknown). Cities in the West and the South reported both GHB and Rohypnol as being widely available.

The same ONDCP report stated that about half of all illicit drug users (49 percent) in 2000 were under the age of 26, but 83 percent of all
hallucinogen users and 62 percent of inhalant users were under age 26. Club drug users tended to be adolescents and young adults, mostly white, and generally from urban and suburban areas. These drugs are most commonly used at “raves,” nightclubs, private parties, and outdoor concerts (ONDCP, 2001). Older illicit drug users (aged 26 and over) favored marijuana, psychotherapeutics, and cocaine, rather than hallucinogens and inhalants (SAMHSA, 2001b).

**Gender.** Men (7.7 percent) reported a higher rate of illicit drug use than women (5.0 percent) in 2000. However, in the 12- to 17-year-old age group, females (3.3 percent) were more likely than men (2.7 percent) to use psychotherapeutic drugs. On the other hand, boys (7.7 percent) in this age group were more likely than girls (6.6 percent) to use marijuana. Among women of childbearing age (15 to 44 years), 3.3 percent reported using illicit drugs in the previous 30 days. Use was considerably higher among African American pregnant women (7.1 percent) than among white (2.9 percent) and Hispanic (2.1 percent) pregnant women (SAMHSA, 2001b).

**Race/Ethnicity.** Current illicit drug use was highest among persons reporting a mixed racial background (14.8 percent), followed by Native Americans (12.6 percent), African Americans (6.4 percent), whites (6.4 percent), Hispanic Americans (5.3 percent), and Asian Americans (2.7 percent). Within the Hispanic American category, the rates ranged from 1.0 percent for Chinese to 6.9 percent for Koreans. Among youths aged 12 to 17, Native Americans had the highest rate (22.2 percent) of illicit drug use (SAMHSA, 2001b) (see also Chapter 11).

**Education.** The rate of reported illicit drug use in the 2000 NSHDA was about the same in the college-age population (aged 18 to 22 years) for those who were full-time students (18.4 percent) as for those who were not (18.2 percent). (The major effect of being in college was an increase in alcohol use.) Although adults who were college graduates were more likely to report having used illicit drugs during their lifetime (44.6 percent) than adults who had not completed high school (28.9 percent), the college graduates had a lower rate of current use (4.2 percent compared to 6.3 percent) (SAMHSA, 2001b).

**Geographic Area.** In 2000, current illicit drug use was highest in the West (8.0 percent), followed by the Northeast (6.6 percent), the Midwest (5.7 percent), and the South (5.5 percent). It was also highest in urbanized, nonmetropolitan counties (6.8 percent), followed by small metropolitan counties (6.5 percent), nonmetropolitan, less urbanized counties (4.5 percent), and rural counties (3.9 percent). Among youths, reports of illicit drug use ranged from 8.0 percent in the less urbanized, nonmetropolitan counties to 11.5 percent in urbanized, nonmetropolitan counties (SAMHSA, 2001b).

**Tobacco**

The only known natural source of nicotine is tobacco, a plant cultivated in temperate climates all over the world. The origin of *nicotiana tabacum* is America, and it is thought that the first and only users of the drug at the time of the European discovery of the New World were the aboriginal peoples of North and South America. A stone carving in an ancient Mayan temple depicts a priest smoking what appears to be a cigar. Columbus was greeted at San Salvador in 1492 with a gift of dried tobacco leaves.

Native Americans smoked or chewed the tobacco leaf. The practice of smoking soon spread to Europe (along with “snuffing”), but chewing was confined largely to America. Early proponents of tobacco use hailed its medicinal qualities, but almost from the beginning, there were vigorous antismoking movements. The Roman Catholic Church forbade smoking in churches on pain of excommunication; Muslim countries defined tobacco as an intoxicant and held that its use was
contrary to the Koran; Dr. Benjamin Rush, founder of the Temperance Union, claimed that the use of tobacco created a desire for “strong drink” (McKim, 1991).

Early smoking was practiced by burning the tobacco in pipes or reeds or by wrapping it in the form of a cigar. The discovery of a low-nicotine, sweet flue-cured tobacco in North Carolina in the midnineteenth century led to the popularity of cigarette smoking. By the 1880s, machines were mass producing millions of cigarettes a day. More than 100 years later, cigarettes still constitute the bulk of tobacco usage throughout the world (Brooks, 1952).

Most textbooks of this type do not deal with tobacco as an addictive substance. We think it deserves special attention for two compelling reasons. First, it is the second most commonly used legal drug, with about 65.5 million Americans reporting current use of a tobacco product in the 2000 NHSDA (SAMHSA, 2001b). Of that group, an estimated 7.6 million were current users of smokeless tobacco. Second, as we mentioned earlier, about 430,000 Americans die annually from tobacco-related illnesses, making tobacco use the nation’s leading cause of death (CDCP, 2001).

About 29.3 percent of the population aged 12 and older reported using tobacco products in 2000. The most popular products used by this population were cigarettes (24.9 percent), cigars (4.8 percent), smokeless tobacco (3.4 percent), and pipe tobacco (1.0 percent). The rate of cigarette smoking dropped from 25.8 percent in 1999, but the difference was not statistically significant (SAMHSA, 2001b).

Age. As with the use of alcohol and other drugs, the rate of cigarette use increases with age, peaks in the 18- to 20-year-old group, and then generally declines. Between 1999 and 2000, cigarette use significantly declined among the 12- to 17-year-old age group (from 14.9 percent to 13.4 percent). It also declined among young adults aged 18 to 25 (from 39.7 percent to 38.3 percent) and among adults aged 26 and older (from 24.9 percent to 24.2 percent) (SAMHSA, 2001b). A recent report from the University of Michigan Institute for Social Research revealed a further decline in cigarette smoking among eighth-, tenth-, and twelfth-graders (Schmid, 2001).

The use of smokeless tobacco was reported by 5.0 percent of young adults (18 to 25 years) in 2000, a decrease from 5.7 percent in 1999. Rates remained stable among youths aged 12 to 17 (2.1 percent) and among adults 26 years and older (3.3 percent). Cigar smoking was also most common among young adults but declined from 11.5 percent in 1999 to 10.4 percent in 2000 (SAMHSA, 2001b).

Gender. Reported tobacco use in the 2000 NHSDA was higher for males (35.2 percent) than for females (23.9), but among the 12- to 17-year-old group, girls (14.1 percent) smoked cigarettes at a higher rate than boys (12.8 percent). Rates of cigarette use for both genders decreased from 1999 to 2000. Males were approximately ten times more likely than females to use smokeless tobacco and five times more likely to smoke cigars. Women of childbearing age (15 to 44 years) who were pregnant smoked less (18.6 percent) than women of the same age who were not pregnant (29.8 percent) (SAMHSA, 2001b).

Race/Ethnicity. The highest rate of tobacco use (all forms) reported in 2000 was by Native Americans (55.0 percent), up from 43.1 percent in 1999. Native Americans also reported the highest rate of cigarette smoking (42.3 percent), followed by persons of mixed race (32.3 percent), whites (25.9 percent), African Americans (23.3 percent), Hispanic Americans (20.7 percent), and Asian Americans (16.5 percent). Among Asian Americans, the rates ranged from 12.4 percent for Asian Indians to 27.0 percent for Chinese. Among Hispanic Americans, the rates ranged from 19.4 percent for Central or South Americans and Cubans to 26.8 percent for Puerto Ricans (SAMHSA, 2001b).

Education. In 2000, young adults (18 to 22 years) enrolled full time in college reported less cigarette use (31.4 percent) than others in this
age group (43.7 percent). Level of education is negatively correlated with cigarette smoking. Persons who lacked a high school diploma reported a rate of 32.4 percent; high school graduates, 31.1 percent; some college, 27.7 percent; and college graduates, 13.9 percent (SAMHSA, 2001b).

**Geographic Area.** There is less variation in cigarette use by region than for alcohol use and other drug use. In 2000, reported cigarette use ranged from 23.1 percent in the Pacific area to 26.9 percent in the east, south, and central parts of the country. Rates of smoking also tended to be higher in less densely populated areas. In large metropolitan areas, 23.5 percent reported having smoked in the previous 30 days, while 27.4 of those in rural areas had smoked. The ranges were considerably greater for youths aged 12 to 17; only 11.6 percent of those in large metropolitan areas reported current cigarette use, while 17.6 percent of those in rural areas reported current use (SAMHSA, 2001b).

**Brands.** Most adolescent smokers in the 2000 NHSDA reported using only three brands of cigarettes. Among those aged 12 to 17 years of age, 54.8 percent reported Marlboro as their usual brand; 23.4 percent reported Newport, and 10.0 percent reported Camel. No other individual brand of cigarette was reported by as many as 2 percent of these youths. Among white smokers aged 12 or older, 43.8 percent reported smoking Marlboros. Among Hispanic Americans in the same age group, 57.1 percent reported smoking Marlboros. Among African Americans in this age group, only 6.7 percent smoked Marlboros, while 40.9 percent smoked Newports. Among 12- to 17-year-old African American smokers, 79.2 reported smoking Newports (SAMHSA, 2001b).

**Polydrug Use/Comorbidity**

According to the 2000 NHSDA, the rate of current illicit drug use for both adults and youths was higher among those who were currently using cigarettes or alcohol, compared with persons not using cigarettes or alcohol. While only 4.6 percent of nonsmokers aged 12 to 17 reported current use of illicit drugs, the rate of illicit drug use for smokers in this age group was 42.7 percent. Among youths who were heavy drinkers, the rate of illicit drug use was 65.5 percent. Only 4.2 percent of youths who were nondrinkers reported illicit drug use (SAMHSA, 2001b).

Not only is it becoming increasingly unusual for a person to use (or abuse) only one substance, it is also common for both mental health and substance disorders to co-occur. Sheehan (1993) states that dual diagnosis, or *comorbidity*, is said to exist “when a patient is suffering with more than one disease. Psychiatry and the addictive medicines refer to the co-existence of a psychoactive chemical use disorder with another major psychiatric disorder” (p. 108). Two comprehensive studies have considered the prevalence of dual diagnoses: the Epidemiologic Catchment Area (ECA) study, which began in 1978, and the National Comorbidity Survey (NCS), which was conducted between 1990 and 1992. According to the ECA study, having a mental disorder more than doubles a person’s chances of having an alcohol diagnosis and increases his or her chances of a drug abuse diagnosis by more than four times (Regier et al., 1990). The NCS revealed rates of substance abuse and dependence exceeding 50 percent among those with both affective and anxiety disorders (Kessler et al., 1994). Chapter 13 presents a more thorough discussion of comorbidity.

**Summary**

The most widely used drugs in the United States are legal drugs. Nearly one-half of all Americans use alcohol on a regular basis, and almost one-third use tobacco products regularly. Marijuana is the most popular illicit drug, preferred by about three-fourths of all illicit drug users. Recent surveys indicate that tobacco use continues to decline, while consumption of alcohol remains sta-
ble. Although regular marijuana use is also declining, on an average day in the United States, about 5,556 persons try marijuana for the first time, compared to 3,737 persons per day who begin smoking tobacco (SAMHSA, 2001b).

The first national survey to estimate the incidence of illicit drug use was conducted in 1971, but estimates of drug use based on retrospective reports indicate that an upward trend began in the mid 1960s (Gfroerer & Brodsky, 1992). Annual marijuana use increased from about 553,000 new users in 1965 to a peak of around 3.2 million new users in 1976 and 1977. Total illicit drug use peaked in 1979, at about 25 million users (SAMHSA, 2000b). Illicit drug use among youths doubled between 1992 and 1995, declined in 1997 and 1998, and has held relatively stable since then (SAMHSA, 2001b).

Since 1996, tobacco use among youths has decreased to 1991 levels (Schmid, 2001). Tobacco use has also declined among young adult smokers, although no change in smoking was noted among older adults. Alcohol use rates have remained stable in recent years for all age groups (SAMHSA, 2001b).

ENDNOTES

1. These data are from the Drug Abuse Warning Network (DAWN) Annual Medical Examiner Data. Hospitals participating in DAWN are nonfederal, short-stay, general hospitals in the coterminous United States that operate 24-hour emergency departments. The DAWN sample consisted of 592 eligible hospitals, and there was an 82 percent participation rate.

2. THC content is the measure of marijuana’s potency. The higher the THC content, the more potent the drug.

RESOURCES

Organizations
National Institute on Drug Abuse (NIDA)
National Institutes of Health
6001 Executive Boulevard, Room 5213
Bethesda, MD 20892-9561
Website: www.nida.nih.gov/

National Institute on Alcohol Abuse and Alcoholism (NIAAA)
6001 Executive Boulevard, Room 5213
Bethesda, MD 20892–7003
Website: www.niaaa.nih.gov/

Centers for Disease Control and Prevention (CDCP)
1600 Clifton Road
Atlanta, GA 30333
Phone: (404) 639-3311
Website: www.cdc.gov

Substance Abuse and Mental Health Services Administration (SAMHSA)
5600 Fishers Lane
Rockville, MD 20857
Website: www.samhsa.gov/

National Council on Alcohol and Drug Dependence (NCADD)
20 Exchange Place, Suite 2902
New York, NY 10005
Phone: (212) 269-7797
Fax: (212) 269-7510
Website: www.ncadd.org

Websites
Club Drugs: www.clubdrugs.org
DAWN: www.samhsa.gov/oas/dawn.htm
Drugtext: www.drugtext.org
IHRA: www.IHRA.nte
Infofax: www.nida.nih.gov/Infofax/Infofaxindex.html

Also see the guide to drug abuse epidemiology produced by the World Health Organization: www.who.int/substance_abuse/PDFfiles/EPI_GUIDE_A.pdf

REFERENCES


