Technologies for Understanding and Preventing Substance Abuse and Addiction

September 1994

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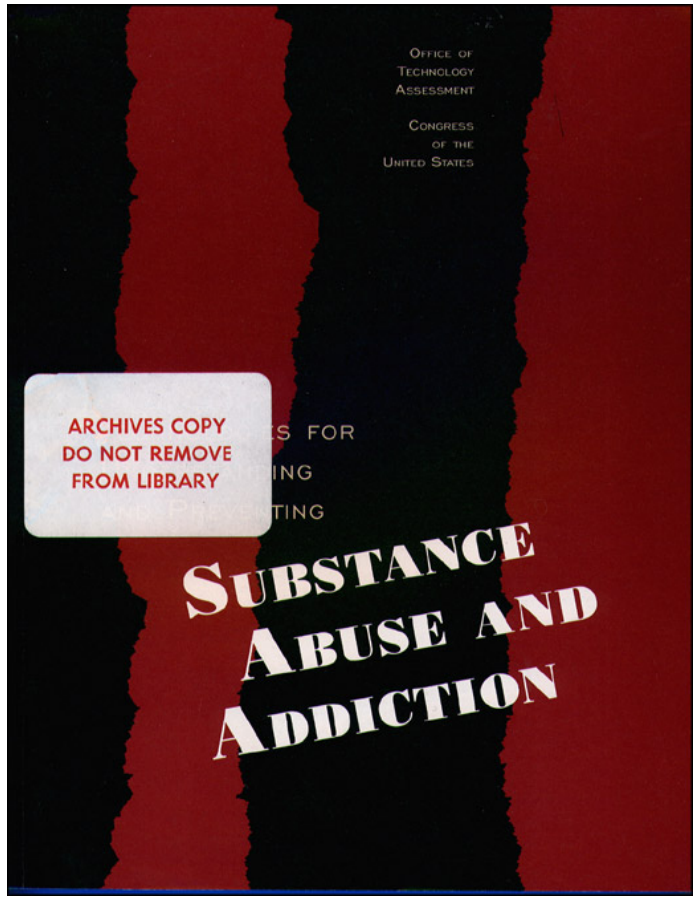

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Foreword

Substance abuse and addiction are major problems in the United States, resulting in lost human potential, increased health costs, violent behavior, crime, lost productivity, and premature deaths. Substance abuse and addiction are not confined to one, or even a few, subpopulations. The complex interactions of biochemical, physiological, psychological, and sociological factors leading to substance abuse and addiction are incompletely understood, and reports of success in reducing illegal drug abuse and addiction are often contradicted by reports of failure.

This report has four parts. The first part, *Necessary Preconditions,* focuses on several factors that are necessary for substance abuse and addiction to occur, including an examination of the biological research regarding the phenomenon of addiction to a variety of substances. The second part, *Individual Factors,* describes individual risk and protective factors that contribute to the abuse of, and addiction to, alcohol and drugs. The third part, *Community Contexts,* looks at how risk and protective factors play out in subcultures and in major activity settings (home, school, workplace, and recreation), and assesses the effectiveness of various substance abuse prevention initiatives. The fourth section, *Policy Options,* addresses a range of legislative issues and options for Congress arising from an understanding of the factors leading to substance abuse and addiction.

The request for this report came from the House Committee on Government Operations, the Senate Committee on Labor and Human Resources, and the Senate Committee on Governmental Affairs. Numerous individuals, including an advisory panel chaired by Patricia Evans, assisted the Office of Technology Assessment (OTA) in the development of this report. OTA gratefully acknowledges the contribution of each of these individuals. OTA also acknowledges and thanks the Strong Museum in Rochester, New York, for providing OTA with access and reproduction rights to graphics from their exhibit entitled *Altered States: Alcohol and Other Drugs in America.* As with all OTA reports, the final responsibility for the content of the report rests with OTA.

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Note: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the advisory panel members. The panel does not, however, necessarily approve, disapprove, or endorse this report. OTA assumes full responsibility for the report and the accuracy of its contents.

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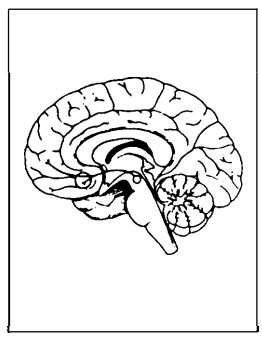
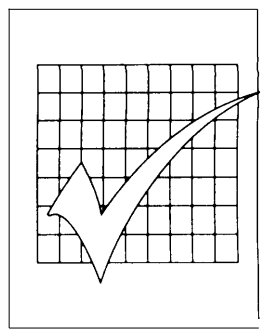
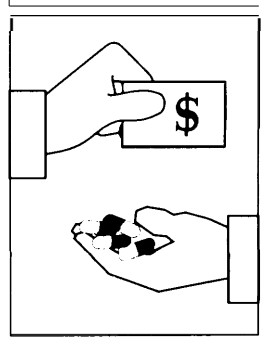




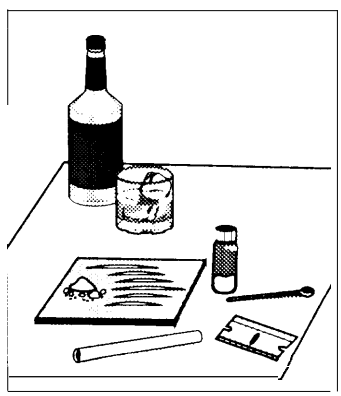


APPENDICES

Executive Summary 1

The abuse of licit and illicit drugs represents a major public health problem in the United States. The costs to society of such abuse include thousands of premature deaths annually due to drug-related illnesses, accidents, and homicides; economic costs related to health care, criminal justice, and lost productivity; and the mental and physical pain suffered by millions of Americans. Many ills plaguing the nation today—including the AIDS epidemic, increased crime and violence, and homelessness—in some cases, may be linked to individuals' physical dependence on a variety of abusable substances. The consequences of substance abuse and addiction have been felt by people within every economic, social, racial, religious, and political boundary.

What are the root causes of substance abuse and addiction? Why and how does addiction occur? Who are the substance abusers? What factors lead to addiction? What are the implications for prevention and treatment?



ROOT CAUSES

The Office of Technology Assessment (OTA) was asked to identify the root causes of substance abuse and addiction. The term *root causes* has been used in political discussions and debate. To some, root causes of substance abuse and addiction are framed in a moral context, in which decisions related to use, abuse, and addiction are the responsibility primarily of individuals. To others, root causes include a multitude of social and economic problems, such as homelessness, poverty, and racism. Many people have strongly held opinions as to what constitutes the general root causes of substance abuse and addiction in populations, but no

consensus exists about the specific root causes of substance abuse and addiction for particular individuals.

The OTA report has four parts: necessary preconditions, individual factors, community contexts, and policy options. The first part, *Necessary Preconditions,* focuses on several factors that are necessary for substance abuse and addiction to occur. The second part, *Individual Factors,* focuses on risk and protective factors in individuals that are thought to influence substance use, abuse, and addiction. The third part, *Community Contexts,* looks at how risk and protective factors play out in subcultures and in major activity settings (home, school, workplace, and recreation). The fourth part, *Policy Options* addresses a range of legislative issues and options for Congress.

NECESSARY PRECONDITIONS

No single or general set of variables explains the misuse of alcohol and other drugs for every individual; in other words there are no "root causes" for substance abuse that universally apply to everyone. Nevertheless, OTA has identified three major sets of necessary preconditions that must be present in order for substance abuse and addiction to occur:

- **biology and pharmacology,**
- **availability, and**
- **use and transitions to abuse and dependency.**

Biology and Pharmacology

The first major set of preconditions includes biological and pharmacological factors, without which drug abuse and dependency would be impossible. Underlying all alcohol and drug problems are the actions and effects that drugs of abuse exert on the brain. It is important to understand how drugs work in the brain, why certain drugs have the potential for being abused, and what, if any, biological differences exist among individuals in their susceptibility to abuse drugs.

A wide range of psychoactive substances have the potential for abuse (see box 1-1). The possession and use of several substances (e.g., marijuana, heroin, cocaine) are illegal in all 50 states. Other addictive substances (e.g., tobacco and alcohol) may be legally purchased, possessed, and consumed by many Americans. Some abusable substances (e.g., a wide range of prescription drugs) are available on a restricted basis, usually by a physician's order, while others (e.g., inhalants) may be legally purchased, possessed, and consumed by anybody.

Biological factors that contribute to substance abuse and addiction fall into two groups: the effects drugs of abuse exert on the individual in general, and the biological status of specific individuals taking drugs. The effects the drugs exert can be either acute or chronic and will vary depending on the drug and its route of administration. Most drugs of abuse influence the brain's reward system. The pleasurable sensations that drug use can produce reinforce drug-seeking and drug-taking behaviors. These actions differ with different drugs; thus, some substances have greater potential for abuse and addiction than others. While growing evidence suggests that the brain reward system plays a role in the reinforcing properties of most drugs of abuse, the precise mechanisms involved are complex and have yet to be completely described (see figures 1-1 and 1-2).

Prolonged or chronic use of a substance or substances can produce both biological and behavioral changes (some long-lasting). Biological changes can include sensitization and/or tolerance to a substance and, if use is discontinued, withdrawal (see box 1-2). Behavioral changes also occur with continued drug use. An individual's drug-craving, drug-seeking, and drug-taking behaviors are reinforced through neuroadaptive changes in the brain's reward system.

Environmental cues also play a large role in drug-seeking and drug-taking behavior. On encountering certain environmental stimuli (i.e., specific locations, smells, tastes), drug-craving and drug withdrawal symptoms have been reported by former drug users who have been drug-free for months and even years.

BOX 1-1: Overview of Alcohol and Some Other Psychoactive Substances

Class of psychoactive **substance**[a] Description[b]	Examples
ALCOHOL (ethyl alcohol)	
Alcohol, one of the most widely used of all drugs, is a central nervous system depressant with effects similar to those of sedative-hypnotic compounds (see below), At low doses, alcohol may be associated with behavioral excitation thought to be due to the depression of inhibitory neurons in the brain Alcohol differs from sedatwe-hypnotic compounds in that it is used primarily for recreation or social rather than medical purposes	1. Beer. 2. Wine. 3. "Hard" liquor (e g., whiskey, gin)
SEDATIVES, HYPNOTICS, OR ANXIOLYTICS	
Sedatwe-hypnotics are drugs of diverse chemical structure that exert a nonselective general depressant on the central nervous system In addition, they reduce metabolism in a variety of tissues in the body, depressing any system that uses energy. Depending on the dose, any sedative hypnotic compound may be classified as a sedative (an agent that allays excitement), a tranquilizer (an antianxiety agent), a hypnotic (a sleep-inducing agent), or an anesthetic (an agent that eliminates pain), Sedative-hypnotics are used medically as sedatives, anxiolytics (antianxiety agents), hypnotics, antiepileptics, muscle relaxants, and general anesthetics.	1 Barbiturates ("downers" or **"barbs")** pentobarbital sodium[Nembutal®], secobarbital sodium [Seconal®], amobarbital IAmytal®]-taken orally 2. Nonbarbiturate hypnotics: methaqualone IQuaaludes®]—taken orally 3. Tranquilizers diazepam [Valium®], chlordiazepoxide hydrochloride [Librium®]—taken orally
CANNABIS (THC)	
THC (tetrahydrocannabinol) the active agent in marijuana, alters perceptions, concentration, emotions, and behavior, though the mechanisms of action are not entirely clear Researchers have found, however, that THC changes the way in which sensory Information is processed by the brain It can be used medically to relieve nausea and side effects of chemotherapy in cancer patients, it is very rarely used to treat glaucoma	1. Marijuana ('(pot" or "grass")—smoked or eaten 2 Hashish ('(hash")—smoked or eaten 3 Hashish oil (((hash oil")—smoked (mixed with tobacco. 4 Tetrahydrocannabinol (THC)—taken orally in capsules
NICOTINE	
Nicotine, obtained naturally from tobacco, is a central nervous system stimulant, [c]It exerts its action secondary to stimulation of certain cholinergic (excitatory) synapses both within the brain and in the peripheral nervous system	1 Cigarettes 2 Smokeless tobacco (e g , snuff or chewing tobacco)

(continued)

BOX 1-1 (cont'd.): Overview of Alcohol and Some Other Psychoactive Substances

Class of psychoactive **substance**[a] **Description**[b]	Examples
COCAINE	
Cocaine, obtained naturally from coca leaves, is a potent central nervous system stimulant.[c] It stimulates the sympathetic nervous system, which regulates the activity of cardiac muscle, smooth muscle, and glands It also produces bronchodilation in the lungs It is used medically as a topical anesthetic for surgical procedures.	1 Cocaine hydrochloride powder ("coke" or "street cocaine'')—usually snorted or injected intravenously. d 2 Cocaine alkaloid ("freebase" or "crack' ')-smoked .[e]
AMPHETAMINES AND RELATED **STIMULANTS**[f]	
1 Amphetamines	
Amphetamines are a group of three closely related compounds, all of which are potent central nervous system and behavioral stimulants [c]Some amphetamines are used medically to treat attention deficit disorder or minimal brain dysfunction in children, narcolepsy (recurrent, uncontrollable, brief episodes of sleep), or (rarely) depression.	1. Amphetamine ("speed" or "uppers" (Benzedrine[R]–taken orally, injected, or snorted, g 2 Methamphetamine ("speed" or "crystal meth" or "ice") [Methadrine[R]—taken orally, injected, or snorted, g'[h] 3 Dextroamphetamine [Dexedrine[R]—taken orally, or injected.
2 Nonamphetamine stimulants	
Like amphetamines, nonamphetamine stimulates are central nervous and behavioral stimulants. Some non-amphetamine stimulants (e g., Preludin[R]) are used for weight control, and some (e. g., Ritalin[R] and Cylert[R]) are used medically to treat hyperactivity, minimal brain dysfunction, narcolepsy, or (rarely) depression	1 Pheumetrazine hydrochloride IPreludin[R]–taken orally or injected.[d] 2 Methylphenidate hydrochloride injected [d] 3. Pemoline ICylert[R]—taken orally. IRitalin[R]—taken orally, or injected, d
HALLUCINOGENS	
Hallucinogens, or psychedelics, are a heterogeneous group of compounds that affect a person's perceptions, sensations, thinking, self-awareness, and emotions. '	1. LSD (lysergic acid diethylamide) or "acid' '-taken orally or put in the eyes. 2 Mescaline (3,4,5 -trimethylox-phenylethyl amide) or "mesc" and peyote-disks chewed, swallowed, or smoked; tablets taken orally. 3 Psilocybin ("magic mushrooms' ')-chewed and swallowed 4 MDMA (methylene dioxymethamphetam ine)—taken orally

(continued)

BOX 1-1 (cont'd.): Overview of Alcohol and Some Other Psychoactive Substances

Class of psychoactive substance[a] Description[b]	Examples
INHALANTS Inhalants are chemicals that produce psychoactive vapors Although different in makeup, nearly all of the abused Inhalants produce effects similar to those of anesthetics, which act to slow down the body's functions or produce feelings of dizziness At low doses, users may feel slightly stimulated Amyl nitrite is used for heart patients because it dilates the blood vessels and Increases blood supply to the heart There are no medical indications for most of the Inhalants	1 Solvents (model airplane glue, nail polish remover, lighter and cleaning fluids, and gasoline) —vapors inhaled 2. Aerosols (e g , paints, hairsprays)—vapors inhaled 3. Some anesthetics (e g ,nitrous oxide) —vapors inhaled 4 Amyl nitrite ("snappers" or "poppers") and butyl nitrite ("rush' ')-vapors inhaled
OPIATES (NARCOTICS) AND RELATED ANALGESICS Opiates are natural or synthetic drugs that, like morphine, a substance derived from the opium poppy, have analgesic (pain-relieving) properties Heroin is not approved for medical uses in the United States The major medical use of other opiates is for the relief of pain (i e , as analgesics), some narcotics are used to relieve coughing (i e , as antitussives) or to treat diarrhea Methadone is used in the treatment of narcotic abstinence syndromes and as an analgesic in terminal illness	1 Heroin ("smack" or "horse")—injected, smoked, or Inhaled[d] 2 Codeine (codeine sulfate) —taken orally or Injected[d] 3 Morphine (morphine hydrochloride)—injected, smoked, or inhaled. 4. Synthetic opiates (e g , methadone [Dolophine[R]]; hydromorphone hydrochloride [Dilaudid[R]], meperidine hydrochloride [Demerol[R]], oxycodone and asprin [Percodan[R]]—taken orally or Injected
PCP (PHENCYCLIDINE) AND SIMILARLY ACTING SYMPHATHOMIMETICS Phencyclidine, commonly referred to as PCP, alters the functions of the neocortex and has been called a dissociative anesthetic It was developed in the 1950s as an anesthetic but was subsequently taken off the market in 1967 when it was discovered that the drug caused hallucinations in some people PCP is now used legally only in veterinary medicine as an immobilizing agent	PCP ("angel dust" or '(lovely ")—taken orally, or smoked (sprayed on joints or cigarettes) [d]

[a]According to Julien, one could conceivably classify psychoactive drugs by at least three methods 1) mechanism of action 2) chemical structure, and3) behavioral effects Probably the most useful approach would be to classify them by mechanism of action, but knowledge of the brains physiology is too limited for this approach to be comprehensive A limitation of the second approach is that many drugs of apparently similar structure exert quite different effects, and many drugs of dissimilar structure exert quite similar effects The classification in this table largely reflects the behavioral effects approach The classification used here is based on the categories in the American Psych iatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed revised According to the American Psych iatric Association, all of the classes of psychoactive substances listed in this box except nicotine are associated with both abuse and dependence Nicotine is associated with dependence but not abuse

(continued,)

BOX 1-1 (cont'd.): Overview of Alcohol and Some Other Psychoactive Substances

[b]The potential **physiological, psychological, and behavioral** effects of using the psychoactive substance shown are discussed in the sources listed below The consequences depend in part on the specific drug used, the dosage level and mode of administration

[c]*Central nervous system stimulants* are drugs that can elevate mood, increase alertness, reduce fatigue, provide a sense of increased energy, decrease appetite, and Improve task performance They can also produce anxiety, insomnia, and irritability. The drugs differ widely in their molecular structures and mechanisms of action.

[d] ***According*** to the ***American*** Psychiatric Association, the route of administration of a psychoactive substance IS an important variable in determining whether use will lead to dependence or abuse In general, routes of administration that produce more efficient absorption of the substance in the blood stream (e g., intravenous injection) tend to increase the likelihood of an escalating pattern of substance usesthat leads to dependence Routes that quickly deliver psychoactive substances to the brain (e g , smoking or intravenous injection) are associated with higher levels of consumption and with an increased likelihood of toxic effects. Use of contaminated needles for intravenous administration of amphetamines, cocaine, and opiates can cause hepatitis, HIV infection, and other Illnesses

[e]*Freebase cocaine* IS a form of cocaine made by converting "street cocaine" (cocaine hydrochloride) to a purified base that IS smoked The effect of smoking freebase IS similar to that of intravenous injection but smoking provides a shorter more intense high than sniffing or ingestion because of the rapid absorption of the drug through the lungs "*Crack cocaine*" IS the street name given to freebase cocaine that has been processed from cocaine hydrochloride to a chemical base by cooking it with baking soda and water The term crack refers to the cracking sound that is heard when the mixtureIS smoked (heated), presumably due to thesodium bicarbonate

[f] Describing a drug as a stimulant does not adequately describe itsproperties Drug use surveys typically mean amphetamines when they use the word stimulants Some surveys regard as stimulants both prescription (amphetamines) and nonprescription substances (e g., caffeine-based compounds used inNo-Doz, diet pills, and "fake pep pills"). Cocaine and nicotine (described above) are also central nervous system simulants

[g] ***According*** to theNational ***Institute*** onDrug Abuse, *designer drugs* are structural analogs of substances scheduled under the Controlled Substances Act that are prepared by underground chemists to mimic the psychoactive effects of controlled substances or produce other psychoactive effects Because such analogs are not identical to their parent compound, their manufacture and distribution does not violate the law As of June 1986, there were synthetic analogs of PCP, fentanyl and meperidine, and amphetamine and methamphetamine.

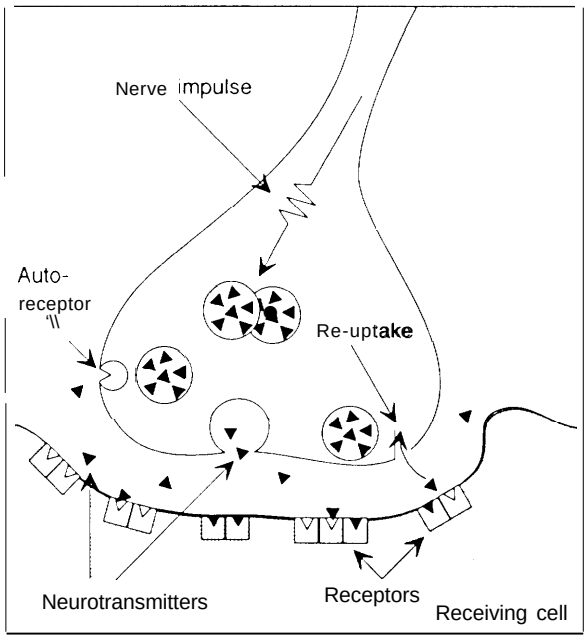
[h]In the past, abuse of methamphetamine had been in the form of tablets or intravenous injection More recently, "ice" (one of the common street names for d-methamphetamine hydrochloride) has gained popularity in a form suitable for smoking

[i] Most of the agents in this class of drugs can induce hallucinations if the dose IS high enough But the term hallucinogen does not adequately describe the range of pharmacological actions of the diverse group of substances usually included in the class The term psychedelic was proposed by Osmond in 1957 to imply that these agents all have the ability to alter the sensory perception and thus may be considered "mind expanding " The effects of hallucinogens are unpredictable and depend on the amount taken, the users personality, mood and expectations, and the surroundings in which the drug IS used.

[j]PCP IS considered a hallucinogen in some surveys of drug use

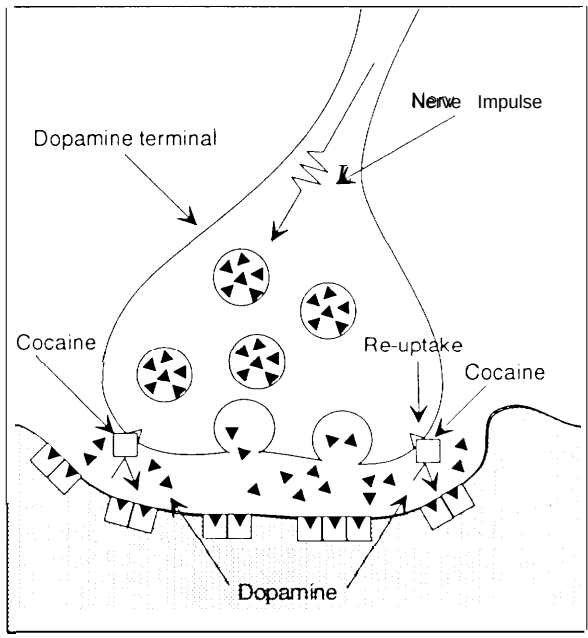
SOURCES Office of Technology Assessment, 1991, based on the following sources. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed revised (Washington, DC 1987), R.M Julien, A *Primer of Drug Action*, 5th ed (New York, NY W H Freeman and Co , 1988); J F Kauffman, H Shaffer, and M Burglass, "The Biological Basics Drugs and Their Effects," *Alcoholism and Substance Abuse Clinical Interventions* (NewYork, NY: 1985), U S Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Hallucinogens and PCP, Inhalants, Marijuana, Opiates, Sedatwe-Hypnotics, Stimulants, and Cocaine," Rockville, MD, 1983, U S Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, NationalInstitute on Drug Abuse, "Designer Drugs, " *N/DA Capsules*, Rockville, MD, June 1986, U S Department of Health and HumanServices, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, '(Marijuana Update, " *N/DA Capsules*, Rockville, MD, May 1989, U S Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Methamphetamine Abuse, " *N/DA Capsules*, Rockville, MD, January 1989, and U S Department of Education, *Growing Up Drug Free A Parent's Guide to Prevent/on* (Washington, DC 1989)

FIGURE 1-1: The Synapse and Associated Structures



SOURCE Office of Technology Assessment, 1994

FIGURE 1-2: Cocaine's Principal Action Mechanism



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Through family, twin, and adoption studies, most researchers agree that genetic factors play some part in the acquisition of alcohol problems and, although less clear, other drug problems. However, no conclusive evidence has been found to explain precisely what is inherited or the overall importance of this inherited material. It has been hypothesized that numerous genes (as opposed to one) interact in complex ways, and expression of those genes are affected by a myriad of environmental factors. Thus, the presence or absence of a genetic factor neither ensures nor protects against drug addiction.

Availability

The second set of preconditions for drug abuse and dependency includes availability. A person cannot become a drug abuser unless a drug is physically available. In addition, however, availability is affected by social norms (e.g., factors within the community conducive to drug use, including level of parental or guardian supervision, lack of consequences for alcohol and drug offenses, lack of alternative activities, and portrayals of alcohol and other drug use by friends and the media as a glamorous and healthy activity), prices (economic availability), and personal values (subjective availability) (see table 1 -1).

The primary focus of U.S. antidrug policy has been to attack the physical availability of illicit drugs through law enforcement efforts aimed at disrupting the production, transport, and sale of drugs. While this focus has increased drug-related arrests-nearly half of newly sentenced federal inmates in 1991 were imprisoned on drug charges-illicit drugs are still widely available.

Marketing techniques for both licit and illicit drugs can alter social, economic, and subjective availability. Key components of marketing include the promotion and advertising of particular product lines to appeal to particular subpopulations of the consuming public, development of a

BOX 1-2: Tolerance, Sensitization, Dependence, and Withdrawal

Tolerance to a drug develops when, following a prolonged period of use, more of the drug is required to produce a given effect. Sensitization, the opposite of tolerance, occurs when the effects of a given dose of a drug increase after repeated administration Dependence is a type of neuroadaptation to drug exposure. With prolonged use of a drug, cells in the brain adapt to its presence such that the drug is required to maintain normal cell function On abrupt withdrawal of the drug, the cell behaves abnormally and a withdrawal syndrome ensues Generally, the withdrawal syndrome is characterized by a series of signs and symptoms that are opposite to those of the drug's acute effects For example, withdrawal of sedative drugs produce excitation and Imitability Conversely, withdrawal of stimulants produces profound depression

SOURCE Off Ice of Technology Assessment, 1994

PATRICIA M TICE

Material from the 'Just Say No" campaign

product line that can be targeted to subpopulations within the larger community of consumers, pricing strategies to attract new buyers, and identification of retail outlets for sales.

Federal law regulates the merchandising of licit yet abusable substances such as tobacco, alcohol, and prescription drugs by placing a variety of restrictions on how such products maybe marketed. Despite current restrictions, debate continues as to whether and how a variety of legal drugs should be marketed.

Use and Transitions to Abuse and Dependency

The third set of preconditions for drug abuse and addiction is drug use, including the progression to heavier and more harmful use. A person cannot become drug-dependent without first using a drug and then progressing to more harmful levels of use. Researchers have focused on stages in the progression of drug use in several ways. They have studied stages in the initiation of the use of different drugs, finding a sequence that moves from the use of cigarettes and wine or beer, to the use of marijuana, then hard liquor, and finally other illicit drugs. Because most individuals who use drugs do not go on to abuse drugs, and because the use of drugs at one level does not guarantee the use of drugs at a higher level, these stages are descriptive but not predictive.

Initiation is the first step in the progression to more serious levels of drug use. Because drug use often begins during adolescence, most drug use research has focused on drug use initiation among adolescents. However, many individuals who initiate drug use do not progress to harmful drug use. Also, the factors associated with such progression may often differ from the factors associated with initiation. Thus, the focus on the initiation of drug use during adolescence is not sufficient for an understanding of the progression from use to abuse and dependency.

In addition to initiation, research has focused on other identifiable stages in the full cycle of drug use and abuse, including continuation of drug use, maintenance and progression of drug use within a class of drugs, progression in drug use across drug classes, and regression, cessation, and relapse-cycles. Research has also been done on the co-

TABLE 1-1: Four Categories of Availability

Category	Primary question
Physical availability	Is a substance physically available?
Economic availability	Is the substance affordable?
Subjective availability	Is the substance available in a manner I would choose to use?
Social availability	Is the substance available in my social setting?

SOURCE Off Ice of Technology Assessment, 1994

occurrence and possible sequences in drug abuse and other problem behaviors, with some studies finding that problem behaviors often precede the onset of drug abuse.

INDIVIDUAL FACTORS

Much of the research on substance abuse and addiction has focused on identifying individual risk factors for alcohol and other drug use, specifically y among adolescents and young adults (see table 1 -2). **Risk factors** have been identified as those cognitive, psychological, attitudinal, social, pharmacological, physiological, and developmental characteristics that foster initiation of drug and alcohol use and/or abuse by an individual. **Protective factors** are those characteristics that reduce the risk of substance use and abuse and promote positive development, such as appropriate role models, involvement in positive peer groups, and a positive self-image and outlook for the future.

Because no individual risk or protective factor can be categorized as a root cause of substance abuse and addiction, a full analysis of each individual factor is beyond the scope of this report. However, an overview of selected factors highlights associations often present in substance abuse and addiction.

Demographic

Age

The preponderance of substance abuse research points to the fact that children who use alcohol and other drugs before the age of 15 have a greater likelihood of becoming problem alcohol and other drug users, versus those youth who begin use at a later age.

While most substance use and abuse occur during the adolescent and young-adult years, older persons are not immune to the addictive powers of these substances. For example, among women, alcohol problems tend to appear on average several years later than they do among men (although this trend may be reversing). For black males, problem drinking patterns typically occur after age 30, versus ages 18 to 25 for white males.

Although substance abuse problems are not exclusive to adolescence, most prevention programs currently target youth. The importance of these types of programs is obvious-to prevent or decrease the use of alcohol, tobacco, cigarettes, and other drugs by youth. Yet, adults can also be exposed to stressful life situations, such as unemployment, divorce, or death of a spouse or child, which could contribute to substance abuse problems. The adult population presents unique and often overlooked challenges for the planning and implementation of substance abuse prevention programs.

Gender

Historically, the vast majority of biological and behavioral studies were conducted on male participants; women substance abusers were not commonly included in research studies. A distorted picture emerged, in which women were assumed to misuse the same substances, and for the same reasons, as men. Within the past 10 to 20 years, however, some researchers have focused on the causes and consequences of substance abuse problems among women, and are beginning to report differences based on gender. Basic gaps in knowledge remain, however, regarding substance use and abuse among women. Until these gaps are addressed, the inaccurate and misleading practice of transferring data garnered from studies on men to women is likely to continue.

Race and Ethnicity

Historically, racial and ethnic minorities have been linked with, and often blamed for, many of

TABLE 1-2: Risk and Protective Factors

RISK FACTORS

Ecological environment
- Poverty
- Living in an economically depressed area with
  - high unemployment
  - inadequate housing
  - poor schools
  - Inadequate health and social services
  - high prevalence of crime
  - high prevalence of illegal drug use
- Minority status involving
  - racial discrimination
  - culture devalued in American society
  - differing generational levels of assimilation
  - cultural and language barriers to getting adequate health care and other social services
  - low educational levels
  - low achievement expectations from society

Family environment
- Alcohol and other drug dependency of parent(s)
- Parental abuse and neglect of children
- Antisocial, sexually deviant, or mentally III parents
- High levels of family stress, including financial strain
- Large, overcrowded family
- Unemployed or underemployed parents
- Parents with little education
- Socially isolated parents
- Single female parent without family/other support
- Family instability
- High level of marital and family conflict and/or family violence
- Parental absenteeism due to separation, divorce, or death
- Lack of family rituals
- Inadequate parenting and low parent/child contact
- Frequent family moves

Constitutional vulnerability of the child
- Child of an alcohol or other drug abuser
- Less than two years between the child and its older/younger siblings
- Birth defects, including possible neurological and neurochemical dysfunctions
- Neuropsychological vulnerabilities
- Physically handicapped
- Physical or mental health problems
- Learning disability

Early behavior problems
- Aggressiveness combined with shyness
- Aggressiveness
- Decreased social Inhibition
- Emotional problems
- Inability to express feelings appropriately
- Hypersensitivity
- Hyperactivity
- Inability to cope with stress
- Problems with relationships
- Cognitive problems
- Low self-esteem
- Difficult temperament
- Personality characteristics of ego under control, rapid tempo, inability to delay gratification, overacting, etc.

the substance abuse problems within the United States (see box 1-3). Certainly, many urban areas have high concentrations of minorities, and within many of these areas the prevalence of substance abuse may be high. Often overlooked, however, is the prevalence of substance abuse problems in suburban and rural areas throughout the United States. In the minds of many, the link between minority populations and rampant substance abuse is inaccurate and derogatory.

Adolescent research has documented substantial racial and ethnic differences in substance use among high school seniors. On average, licit and illicit substance use is highest among Native American Indian youth, somewhat lower among white and Hispanic youth, substantially lower

TABLE 1-2 (cont'd.): Risk and Protective Factors

Adolescent problems
- School failure and dropout
- At risk of dropping out
- Delinquency
- Violent acts
- Gateway drug use
- Other drug use and abuse
- Early unprotected sexual activity
- Teenage pregnancy/teen parenthood
- Unemployed or underemployed
- At risk of being unemployed
- Mental health problems
- Suicidal

Negative adolescent behavior and experiences
- Lack of bonding to society (family, school, and community)
- Rebelliousness and nonconformity
- Resistance to authority
- Strong need for Independence
- Cultural alienation
- Fragile ego
- Feelings of failure
- Present versus future orientation
- Hopelessness
- Lack of self-esteem
- Inability to form positive close relationships
- Vulnerability to negative peer pressure

PROTECTIVE FACTORS

Ecological environment
- Middle or upper class
- Low unemployment
- Adequate housing
- Pleasant neighborhood
- Low prevalence of neighborhood crime
- Good schools
- A school climate that promotes learning, participation, and responsibility
- High-quallty health care
- Easy access to adequate social services
- Flexible social service providers who put client's needs first

Family environment
- Adequate family income
- Structured and nurturing family
- Parents promote learning
- Fewer than four children in family
- Siblings 2 or more years apart in age
- Few chronic stressful life events
- Multigenerational kinship network
- Nonkin support network, e.g., supportive role models, dependable substitute childcare
- Warm, close personal relationship with parent(s) and/or other adult(s)
- Little marital conflict
- Family stability and cohesiveness
- Plenty of attention during first year of life
- Sibling as caretaker/confidante

Constitutional strengths
- Adequate early sensorimotor and language development
- High Intelligence
- Physically robust
- No emotional or temperamental impairments

Personality of the child
- Affectionate/endearing
- Easy temperament
- Autonomous
- Adaptable and flexible
- Positive outlook
- Health expectations
- Self-esteem
- Self-discipline
- Internal locus of control
- Problem-solving skills
- Socially adept
- Tolerant

SOURCE U S Department of Health and Human Services, Off Ice for Substance Abuse Prevention, Breaking New Ground for Youth *at Risk: Program Summaries* OSAP Technical Report 1, DHHS Publication No. (ADM) 91-1858 (Washington, DC 1991)

among black youth, and lowest among Asian youth. However, such findings do not include populations most likely to be excluded from self-reporting studies (e.g., high school dropouts).

Until recently, much of the analysis of substance use and/or abuse data has concentrated on the relationship between the use of a substance and one or two variables such as race and ethnic it y and/or educational level. Often a positive association was found between minority populations and the use or abuse of certain substances. While statistically correct, these analyses can be simplistic and misleading. Clearly many risk and protective factors interact to produce substance use and abuse. If the majority of these variables are excluded from the analysis, a skewed picture may arise as to the importance of certain variables as risk factors for substance use and abuse. Additional y, to simplify the data collection, racial and ethnic categories are often broad. The most popular groupings are black, white non-Hispanic, Hispanic, and other. While each of these categories contains many distinct cultures, gross generalizations are commonly made.

Race and ethnicity have not been shown to be either biological or genetic risk factors for substance use or abuse. To date, the preponderance of investigative studies has focused on racial and ethnic differences in response specifically to alcohol. Few studies have been completed on differences in racial and ethnic biological responses to other licit or illicit drugs.

Economic

Are poor individuals at greater risk of developing problems related to substance abuse? While a relatively straight forward question, its resolution is hampered by the fact that poverty is difficult to define and drawing conclusions concerning an individual potential for future substance abuse based on one or two variables such as family income or educational level is overly simplistic and deceptive.

In recent years, attention has been paid to the plight of the urban poor, many of whom are minorities. These inner-city communities are often riddled with high rates of crime, violence, unemployment, and inadequate social and medical services. For individuals living in these localities, the consequences of these problems are serious and far reaching.

To assess poverty and its relationship to substance abuse problems, some researchers have used the federal guidelines for poverty, while others employ measures of socioeconomic status (SES) such as educational level and household income. To date, the largest and most comprehensive analysis of SES variables and substance use has been accomplished by the National Institute on Drug Abuse (NIDA). While the analysis revealed *associations* between certain characteristics and patterns of substance use, it did not reveal *causality*. From this analysis, a straightforward "yes or no" response to the initial question linking poverty to increased individual risk for substance use or abuse is clearly impossible. The NIDA analysis demonstrated that the type and quantity of an individual's substance use is correlated with a variety of both individual as well as geographic characteristics. Furthermore, while the NIDA study was the largest and most comprehensive to date, some segments of the population (e.g., homeless, dropouts, institutionalized), many of whom were possible alcohol and drug abusers, were excluded from the survey.

Psychosocial and Behavioral

Many of the identified risk and protective factors relate to psychological, social, and behavioral characteristics. Conditions such as aggressiveness, delinquency, and mental disorders are often linked with substance abuse and addiction. Experiences such as physical and sexual abuse have also been identified as potential risk factors. While relatively little research has been accomplished on protective factors, several elements identified within the resiliency literature, as well as religiosity and spirituality, have been associated with decreased substance use.

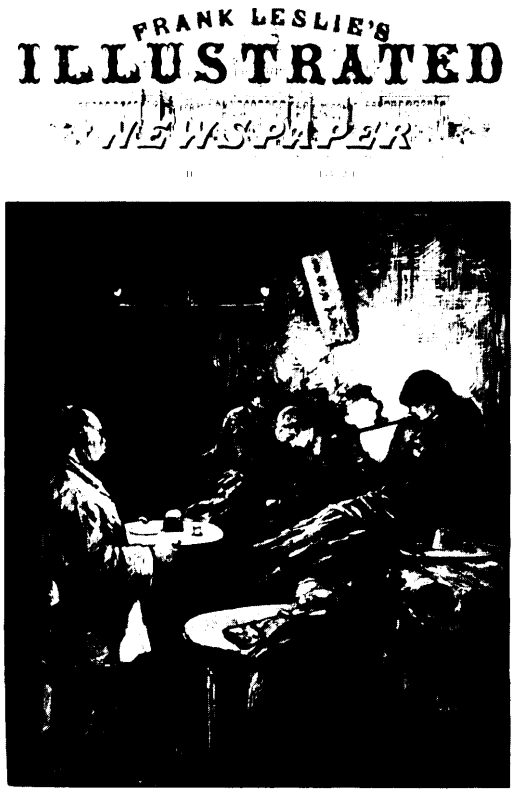
However, the presence or absence of specific risk factors neither predicates nor guarantees protection from substance abuse. In addition,

BOX 1–3: Drugs and Discrimination

In America, tensions between the majority and various minorities often hinge on concerns raised by drug use The groups change over time and place, but the dividing issues remain remarkably similar Those in power decide which drugs are legal and how rules should be enforced Minorities charge that unfair policies result from prejudice, Ignorance, and hypocrisy

When? 1850
Where? Boston
Who? Irish Immigrants

Impoverished Irish Immigrants brought the tradition of drinking whiskey with them In American cities, people often blamed whiskey for neighborhood quarrels In the mid-19th century, clashes with Irish Immigrants occurred so often that pollee vans came to be known by the term "paddy wagons "



When? 1880s
Where? San Francisco
Who? Chinese Immigrants

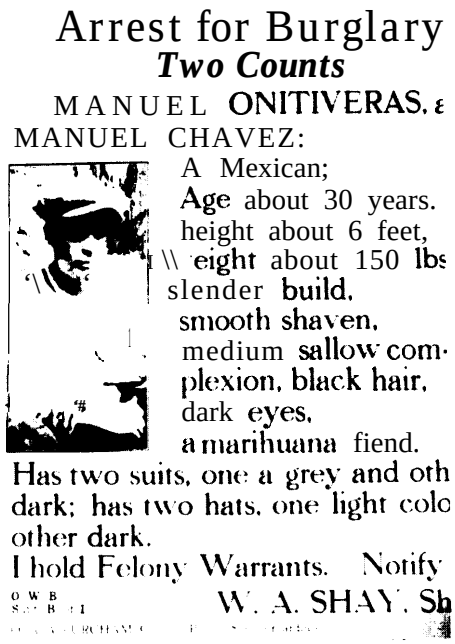
Fear of Immigrant Chinese often focused on their recreational use of opium In 1875, San Francisco outlawed opium smoking which most residents associated exclusively with the Chinese This citywide ban became nationwide in 1909

(continued)

BOX 1–3 (cont'd.): Drugs and Discrimination

When? 1882
Where? Ohio
Who? German Immigrants

Beer drinking often brought Germans into conflict with temperance advocates. Cincinnati's lively German community gathered at beer gardens on Sundays to sing, dance, drink, and argue politics. In 1882, Ohio's governor denounced Germans as "sabbath breakers, criminals, and free thinkers "


Arrest for Burglary
Two Counts
MANUEL ONITIVERAS, a
MANUEL CHAVEZ:
A Mexican;
Age about 30 years.
height about 6 feet,
eight about 150 lbs
slender build.
smooth shaven,
medium sallow com-
plexion, black hair,
dark eyes,
a marihuana fiend.
Has two suits, one a grey and oth
dark; has two hats, one light colo
other dark.
I hold Felony Warrants. Notify
W. A. SHAY, Sh

When? 1930s
Where? Colorado, New Mexico
Who? Mexican Migrant Workers

The Southwest welcomed Mexican migrants during labor shortages But during the Depression, anxiety over competition for jobs shifted to wildly exaggerated fears of the effects of marijuana use customary among Mexicans To placate fears, Congress passed the Marijuana Tax Act of 1937, which prohibited recreational use of the drug

BOX 1–3: (cont'd.): Drugs and Discrimination

When? 1991
Who? African Americans

Police forces are largely white and inner-city residents are mostly black. Between 1980 and 1990, the drug-arrest rate in the city of Rochester, New York, was about five times that for suburban Monroe County.

SOURCE: "Altered States: Alcohol and Other Drugs in America," Strong Museum, Rochester, NY, 1993

consensus is lacking within the substance abuse field as to the importance, interaction, or order of the factors.

COMMUNITY CONTEXTS

A growing body of research is focusing on factors and interventions relevant to the onset and prevention of substance use, abuse, and dependency in the four principal community activity settings—homes and families, schools and peers, workplaces, and recreational settings.

In framing prevention programs with divergent populations, researchers are attempting to better understand *qualitative* as well as *quantitative* research methods, and the variety of settings in which substance abuse and addiction can take place and can be combatted (see box 1-4).

Despite the promise of community-based research, several problems exist. First, much of the research does not address substance abuse and addiction per se, but rather risk and protective factors that can lead to a number of outcomes, including substance abuse and addiction. Second, research studies vary widely in methodology, making it difficult to draw scientifically valid conclusions. Third, rigorous evaluation of many prevention research programs is missing, leaving the effectiveness of such programs open to debate.

Homes and Families

Although American society expects families in their homes to take the lead in dealing with substance abuse and other problem behaviors, families in this country generally receive only limited support in protecting themselves against substance abuse. This situation may result in part from the belief that most nuclear families can raise their children largely independently and therefore do not need outside support, and in part from the belief that teens and young adults are more influenced by their peers. The first belief, however, is not supported by long-standing practices in

BOX 1-4: Ethnography

Ethnographic techniques allow researchers to study how environmental and cultural factors affect values, attitudes, and behaviors of individuals and groups, For three decades, researchers have documented societal and cultural influences on the patterns of substance use, abuse, and addiction; using a range of methodologies and working in diverse contexts, ethnographers have contributed to the understanding of substance abuse Interacting with drug users under a wider set of circumstances than do strict quantitative researchers, ethnographers have expanded the framework of substance abuse research hypotheses They have also assisted in the evaluation and interpretation of clinical and survey data to different subcultures and populations.

Ethnographies also provide information on constantly changing substance use patterns By collecting data from substance users in their natural environments, ethnographers have been able to document who uses drugs and how drugs are used This type of methodology is essential to the historical understanding of substance use and abuse.

Lastly, ethnographers have documented different styles of substance use within American society as well as abroad. Differences are cited in experience and use patterns based on social class, cultural background, gender, and geographic location

SOURCE Office of Technology Assessment, 1994.

most societies, where extended families and lifelong neighbors have traditionally helped raise children (although in the United States many parents do not have access to these additional child-rearing resources because of urbanization, high technology, and family mobility). And the second belief is being questioned by growing evidence that certain parenting practices and family intervention programs can significantly reduce the risk of substance abuse among adolescents and young adults.

A growing body of research has identified risk and protective factors that may be particularly relevant in home and family situations (see table 1-3). Programs that enhance protective factors include those providing parent education, prenatal and infant care, preschool, and social support activities that help strengthen involved and responsive parenting. Programs that seek to decrease the presence of risk factors include those designed to reduce drug trafficking (e.g., community policing, clean sweeps of housing projects), physical and sexual abuse, the impact of negative life events (e.g., mental health counseling), and parental neglect. Substance abuse treatment programs that include an addict's family members also address risk factors.

Schools and Peers

Schools have been the target for prevention programs to curtail drug use at school sites (e.g., Drug Free School Zones) as well as curriculum-based programs that target drug use in the community as a whole. Because school-age youth are especially likely to initiate the use of alcohol and other drugs, much of the research has focused on use, rather

TABLE 1–3: Identified Risk and Protective Factors, Home and Families

Protective factors
Close family relationships
Sufficient monitoring of children
Attractive alternatives to substance use and abuse
Risk factors
Parental neglect and rejection
Physical and sexual abuse
Substance abuse in the family
Major negative life events
Drug-trafficking neighborhoods and drug-using friends

SOURCE Office of Technology Assessment, 1994

TABLE 1–4: Factors in School–Aged Database Associated with Substance Use

- Prior Use
- Drug Use by Others
  - Peer/friend use
  - Use and deviant behavior by a relative
  - Sibling use
  - Availability
  - Parental use
- Intentions
- Overt and Normative Pressures
  - Peer/friend attitudes about drug use
  - Offers to use
  - Others' attitudes about use
  - Motivation to comply with pressure
  - Media Influences
  - Others' attitudes about other issues
- Cognitive Factors
  - Attitudes
  - Beliefs about psychological consequences
  - Value of achievement
  - Religious values
  - General values
  - Beliefs about health consequences
- Demographic Factors
  - Age/grade
  - Race
  - Geographic identifiers
  - Gender
- Personality Characteristics
  - Deviance
  - Independence
  - Affect
  - Personality traits
  - Social personality traits
  - Self-esteem
  - Locus of control
- Peer Factors
  - Intimacy
  - Peer group characteristics
  - Peer bonding
  - Peer-parent relations
- Competence
  - Self-efficacy
  - Stress management skills
  - School performance
  - Self-management skills
  - Intelligence
- Institutional Influences
  - School bonding
  - Participation in nonstructured activities
  - Religious affiliation
  - Moral codes
  - Church attendance
  - Participation in structured activities
  - Academic expectations
- Home Factors
  - Socioeconomic status
  - Parental relations
  - Parents' psychological traits
  - Parents' marriage
  - Parents' education
  - Family composition

SOURCE Office of Technology Assessment, 1994

than on abuse and dependency. Such research is nevertheless relevant to an understanding of abuse and dependency, since use is a precondition and contributor to abuse and dependency and because even experimental use can be harmful.

OTA conducted the most extensive compilation and examination of survey research on school-aged substance use to date—9,930 statistical analyses from 242 separate studies. The studies reported statistical relationships between substance use and its postulated causes. Statistical findings from the study reports were sorted into 11 major categories and 50 subcategories (see table 1 -4), and then analyzed to identify strong, moderate, and weak statistical relationships, as well as those that had been insufficiently studied. The four variables that dominated as correlates of and possible contributors to substance abuse are: 1) prior and concurrent use of substances, 2) substance use by peers and friends, 3) perceived peer attitudes about substance use, and 4) offers to use substances. The prominence of prior and concurrent use is consistent with the reinforcing nature of substance use itself. The prominence of the other three variables emphasizes the importance of the social environment in contributing to and reinforcing substance use among school-age youth.

Schools primarily seek to prevent substance use and abuse through curriculum-based drug prevention programs. Such programs have dominated the field, largely because they are relatively simple to understand, implement, and replicate, and because methods to evaluate them have become standardized. Curriculum-based prevention

programs have been hampered, however, by a lack of good evaluation data needed to prove their effectiveness.

Workplaces

The prevalence of drug abuse among the employed remains inadequately documented, based on a small number of studies. Substance abuse contributes to workplace problems, such as accidents, injuries, absenteeism, turnover, lost productivity, compensation claims, and insurance costs. Substance abuse in workplaces can be affected by nonworkplace factors and workplace factors. The primary interventions are employee assistance programs that help employees with personal problems by providing services directly (through the work organization) or indirectly (through a provider in the community); health promotion programs that typically seek to prevent illness and promote wellness through behavior change; and alterations to workplace environments that seek to reduce stress and strengthen support for workers.

Recreational Settings

Recreational activities and settings may also contribute to the prevention of substance use and abuse or, by their absence, increase the risk. Examples of recreational activities and settings include Boys and Girls Clubs, Boy and Girl Scouts, organized sports, and local park and recreation department programs.

Research on the impact of organized youth activities on substance use and abuse is limited, and only a few studies have addressed the issue directly. However, existing research indicates that involvement in youth programs and activities is associated with fewer at-risk behaviors, including substance use among youth. The youth development field, including the resources of park and recreation departments, provides opportunities for broad-based prevention interventions.

Involvement in activities does not by itself protect against substance abuse. Some activities, such as those that are unstructured and unsupervised, may even increase the risks of substance use and abuse through association with a wider range of peers, some of whom are using substances. In addition, activities perceived as boring may not protect against substance use and abuse. More research is needed to clarify the aspects of recreational and other leisure activities that may protect against substance use and abuse. Research might focus on whether activities that are supervised, structured, drug-free, empowering, skills-building, self-esteem-promoting, active, shared, and nonboring (or some combination of those) are associated with lower levels of substance use and abuse.

POLICY OPTIONS

Issues related to substance abuse and addiction have long occupied the attention of the American public (see table 1-5). Congress has authorized a multitude of federal programs aimed at reducing or preventing the supply and demand of illicit drugs and regulating the availability of illicit substances, and has appropriated billions of dollars each year to federal agencies, provided oversight of federal programs, and passed broad-based legislation to coordinate programs as part of the war on drugs. In addressing what some policy makers term as the root causes of substance abuse and addiction, the list of relevant statutes expands significantly, as many domestic and social programs can influence the risk and protective factors that can lead an individual into or away from substance abuse and addiction.

A total of 12 executive branch departments, four independent agencies, one multiagency program (Weed and Seed), one White House office (the Office of National Drug Control Policy—ONDCP), and the Judiciary, all receive federal funding as part of national drug control strategy. These efforts include interdiction, treatment, and prevention programs.

The federal substance abuse control policy has as its primary focus the eradication of the supply of drugs. Congress currently appropriates more than $12 billion annually on antidrug efforts, with approximately two-thirds of this amount supporting drug interdiction and law enforcement activi-

TABLE 1–5: Major Events in Combating Drugs

1900–20s The first drug bans are enacted in the United ***States.***

1906: The Pure Food and Drug Act requires labeling of over-the-counter medicines containing psychoactive Ingredients such as alcohol, cocaine, opiates, and cannabis,

1909: Congress bans opium imports

1914: Congress passes the Harrison Narcotics Act regulating the production and sale of opiates and cocaine

1919: The U S. Supreme Court rules in Webb et al. v. United States that doctors may not prescribe maintenance supplies of narcotics to addicts. The decision effectively criminalizes the drug-consuming behavior of addicts.

1920s-30s ***Prohibition of alcohol gives rise to a booming underground market in alcohol, while the Depression inreases xenophobia against immigrants and pressure*** to ***ban the drugs associated with them.***

1920: The 18th Amendment to the Constitution, prohibiting the production and sale of alcohol, takes effect

1933: The *21st* Amendment repealing Prohibition is ratified.

1937: Congress passes the Marijuana Tax Act, making registration and taxation of marijuana buyers and sellers mandatory, and Imposing criminal penalties.

1960s-70s ***The drug culture that flourished in the 1960s is followed by a crackdown on drug use.***

1970: The Comprehensive Drug Abuse Prevention and Control Act consolidates drug laws and sets penalties for trafficking according to each illegal substance's perceived harmfulness

1971: President Richard M Nixon declares the nation's first "war on drugs" and creates an executive branch office to coordinate drug policy.

1973: The Federal Drug Enforcement Administration (DEA) is established.

1978: Law enforcement agencies are authorized by Congress to seize the assets of drug dealers, including money, real estate, and vehicles

1980s ***Harsher antidrug policies are enacted.***

1984: Congress enacts mandatory minimum prison sentences for certain drug offenses

1986: President Ronald Reagan declares a "war on drugs" and announces he wiII seek stricter laws against the sale and use of illegal drugs, Congress enacts legislation linking the length of mandatory prison sentences to the types of Illegal drugs Involved.

1988: Congress passes the Anti-Drug Abuse Act, which stiffens penalties for drug possession and requires the President to issue an annual drug control strategy,

1989: Worldwide heroin production reaches an all-time record Calling drugs '(the gravest threat facing our nation today, " President George Bush appoints William J. Bennett as the first '(drug czar, " or director of the new Off Ice of National Drug Control Policy U S forces invade Panama and capture Gen. Manuel Antonio Noriega, a reputed key figure in the cocaine trade

1990s ***Statistics show a fall in consumption of most illegal drugs.***

1991: The U.S. Supreme Court upholds a Michigan law imposing a mandatory life sentence without the possibility of parole to anyone convicted of possessing more than 650 grams of cocaine

1993: The U S Supreme Court rules that officials may not seize property acquired with the proceeds of illegal drug sales if the owner is unaware of the source of those funds. The ruling weakens one of the governments main weapons in the drug war

SOURCE Off Ice of Technology Assessment, 1994, based on "War on Drugs, " The CQ *Researcher,* Mar 19 1993, vol. 3, No. 11.

ties, and the remainder supporting demand-side activities, such as drug treatment, research, and prevention programs.

Drug demand reduction efforts focus on providing treatment for abusers and addicts, prevention programs for various populations, and biomedical and behavioral research on the causes of substance use, abuse, and addiction. Of these, the federal government spends the most on treatment, followed by prevention and causality research. Drug treatment and prevention programs are funded at both the federal and state levels, while causation research is funded primarily by the federal government. A recent General Accounting Office (GAO) study revealed that for studying the causes of drug abuse, funding has remained comparatively tiny. In 1990, for example, such research was funded at a level of $6 million, about one-tenth of one percent of the nation's drug control budget for that year.

OTA, in conjunction with GAO, surveyed federal agencies identified as having substance abuse prevention efforts. **OTA finds that substance abuse prevention efforts are scattered over a number of federal agencies, and that federal prevention efforts are dictated by statutory mandates, rather than directed at identifying causes of substance abuse and addiction per se. The White House ONDCP, charged with coordinating federal antidrug efforts, lacks the statutory mandate to forcibly integrate or alter the multitude of programs that make up the federal government's war on drugs.**

Congress faces several fundamental difficulties in addressing the causes of substance abuse and addiction:

- **No scientific consensus exists as to what is the driving cause of substance abuse and addiction.** A range of risk and protective factors have been associated with drug use, abuse, and addiction.
- **Federal antidrug efforts, though coordinated by ONDCP, are spread among many federal agencies, whose authorization and appropriations fall under the jurisdiction of numerous congressional committees and subcommittees.** ONDCP efforts in drug demand reduction efforts alone involved federal agencies across at least 11 Cabinet-level departments. This makes coordinated legislative action difficult to achieve.
- **The federal budget deficit is an obstacle to the creation of new domestic programs or the enhancement of existing programs that target known risk and protective factors in individuals and communities. The** framework and literature reviews presented in this report make clear that substance abuse and addiction can arise and be influenced by multiple factors in individuals, groups, and communities. Thus, effective intervention requires prevention practitioners to select from a variety of options, so they can target the specific factors that are especially important for the particular populations and communities they are addressing. This does not mean that everything must be done at once nor that everything be known in advance of taking action. To the contrary, policy makers and practitioners can take small steps at a time, and then, as resources and new knowledge permit, take additional steps

TABLE 1–6: Categories of Policy Issues

Federal Focus and Prevention Program Structure
Supply Versus Demand Reduction
Structure of the Off Ice of National Drug Control Policy
Structure of Federal Substance Abuse Prevention Programs
Evaluation of Prevention Programs
Research Needs
Data Collection
Individual Risk and Protective Factors
Biomedical Research
Community Activity **Settings**
Schools and Peers
Homes and Families
Workplaces
Recreational and Community Settings
Availability
Taxes
Alcohol Labeling

SOURCE Office of Technology Assessment, 1994

TABLE 1–7: Policy Issues and Options

Federal Focus and Prevention Program Structure

How much should federal substance abuse control o/icy focus on the supply of substances versus the demand for substances?

Opt/ens include

—Increase appropriations for treatment and prevention programs,
—Redirect some of the interdiction funds to increase support for treatment and prevention programs
—Require that assets forfeited in drug seizures be Increasingly used to support treatment and prevention programs

Should the White House Office of National Drug Control Policy (ONDCP) be reauthorized and, if so, should its authority be modified?

Options include

—Direct ONDCP to address the full range of the most harmful abusable substances, including alcohol, tobacco, and Inhalants
—Alter ONDCP'S leadership structure,
—Give ONDCP Increased authority over federal agency antidrug programs
—Mandate the size of ONDCP
—Allow the authorization for ONDCP to expire

Should federal substance abuse prevention programs be more fully integrated into a single agency?

Options include

—Merge the National institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAA) into a single National Institute on Substance Abuse and Addiction
—Place CSAP in the Center for Disease Control and Prevention or in the Health Resources and Services Administration
—Merge federal substance abuse prevention efforts into a single agency, such as the Center for substance Abuse Prevention (CSAP)

How should evaluation of substance abuse prevention programs be improved?

Options include:

—Allow the current level of process and outcome evaluation related to substance abuse programs to continue
—Direct NIDA, NIAAA, or CSAP to lead a national process to forge consensus on standardized definitions and outcome measures,
—Require states to use a portion of their 20 percent prevention set-aside (under the Alcohol and Drug Abuse Block Grant program) and a portion of their Drug-Free Schools funds for evaluation of substance abuse prevention programs

(continued)

that address a fuller range of factors and contexts in greater depth.

- **Current drug prevention programs lack scientifically accepted standards for determining their success or failure.** Whatever methods are developed, tested, and incorporated into prevention programs, a critical component of success is careful, rigorous evaluation. Answering "what works?" is essential in making advances in preventing substance abuse.

In choosing which policy issues to address, OTA focused on those areas directly addressed in this study. OTA identified a series of policy issues in four broad categories: federal focus and prevention program structure, research needs, community activity settings, and availability (see table 1-6). A number of policy questions and options for congressional action emerge from these four categories (see table 1-7). A full discussion of the policy issues and options for congressional action can be found in chapter 9 of the full report. Given the broad nature of federal antidrug efforts, many important issues relating to federal antidrug efforts remain beyond the scope of this report. Such topics include drug treatment, interdiction and enforcement, and drug legalization.

TABLE 1–7 (cont'd.): Policy Issues and Options

Research Needs

Do national surveys adequately document substance use, abuse, and addiction?

Options include:

—Continue with no substantial changes.
—Direct that the Household and High School Seniors surveys be conducted less intensely or less frequently.
—Direct NIDA to develop and support survey methodology that reaches populations missed by current surveys.
—Create a mechanism for the regular and nonpolitical release of survey data.

/s an adequate proportion of federal research being conducted on the underlying risk and protective factors that can lead to substance abuse and addiction?

Options include

—Monitor the amount and scope of risk and protective factor research that IS being conducted, and redirect federal efforts toward more extensive multifactor research and analysis as needed.

Should current levels of federal funding for drug-related biomedical research be altered?

Options include

—Continue to increase annual appropriations for biomedical research at NIH.
—Substantially raise appropriations levels for NIDA and NIAAA.
—Reduce funding for NIH research,

Community Activity Setting

Do Federal programs affecting homes and families, schools and peer groups, workplaces, and recreation settings adequately address issues of substance abuse and addiction?

Options include:

—Continue to fund school-based prevention programs, with a continued emphasis on prevention curricula and evaluations that are limited to substance use prevention.
—Require the Department of Education (DOE) to spend a set percent of its Drug-Free Schools monies on research and evaluation of prevention curricula and the dissemination of findings.
—Require DOE to set aside a certain percentage of Drug-Free Schools funds for a variety of activities that target high-risk youth and to work individually with them and their families.
—Encourage the support of school-based clinics.
—Create a Presidential commission or task force to formulate a national family policy.
—Mandate that federal agencies increase the reformation that is made available to workplaces about drug-free workplace programs and policies.
—Direct CSAP to expand technical assistance and outcome evaluation measures to the community partnership demonstration programs.
—Establish an information clearinghouse about federal and nonfederal recreational and youth development activites.

Availability

is alcohol and/or tobacco taxed at an appropriate level?

Options include:

—Continue current levels of taxation,
—Raise federal excise tax on a variety of tobacco and alcohol products

Is current alcohol labeling appropriate?

Options include

—Continue to require each alcoholic beverage container bear a specific warning statement.
—Require warnings on all alcohol beverage advertising.

SOURCE Off Ice of Technology Assessment, 1994

2 Introduction

Substance abuse and addiction are pervasive in our society, with their consequences felt by people in every economic, social, racial, and political boundary.

The United States has grappled with problems associated with substance abuse and addiction for over a century (see appendix A and table 2-1). In 1986, then-President Ronald Reagan launched what has become known as the war on drugs. Federal spending to combat drugs increased from $1.5 billion in 1981 to more than $12 billion in 1994, with spending in 1995 projected to pass the $13 billion mark (see table 2-2). Nearly two-thirds of the federal antidrug budget goes toward efforts to curb the supply of drugs (e.g., border interdiction, law enforcement), with the remainder being spent on drug treatment and prevention programs. While the use of illegal drugs has declined in the United States in recent years, a vigorous debate continues as to whether the nation is indeed winning the war on drugs, and what the balance of federal effort should be in formulating programs to decrease the supply of drugs, treat drug abusers and addicts, and educate Americans about problems associated with drug abuse and addiction.

Congress has enacted a number of laws in an attempt to create a national policy to fight the scourge of drug abuse and addiction. As part of oversight responsibility for national drug policy, several committees of Congress have requested the Office of Technology Assessment (OTA) to undertake a study addressing the socioeconomic, psychological, physiological, and genetic underpinnings of substance abuse and addiction (see table 2-3).

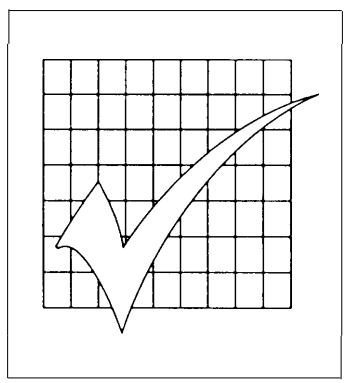


TABLE 2-1: Major Events in Combating Drugs

1900-20s *The first drug bans are enacted in the United States.*

1906: The Pure Food and Drug Act requires labeling of over-the-counter medicines containing psychoactive Ingredients such as alcohol, cocaine, opiates, and cannabis,

1909: Congress bans opium Imports.

1914: Congress passes the Harrison Narcotics Act regulating the production and sale of opiates and cocaine,

1919: The U.S. Supreme Court rules in *Webb et al. v. United States* that doctors may not prescribe maintenance supplies of narcotics to addicts The decision effectively criminalizes the drug-consuming behavior of addicts.

1920s-30s *Prohibition of alcohol gives rise to a booming underground market in alcohol, while the Depression increases xenophobia against immigrants and pressure to ban the drugs associated with them.*

1920: The 18th Amendment to the Constitution, prohibiting the production and sale of alcohol, takes effect

1933: The 21st Amendment repealing Prohibition is ratified

1937: Congress passes the Marijuana Tax Act, making registration and taxation of marijuana buyers and sellers mandatory, and imposing criminal penalties.

1960s-70s *The drug culture that flourished in the 1960s is followed by a crackdown on drug use.*

1970: The Comprehensive Drug Abuse Prevention and Control Act consolidates drug laws and sets penalties for trafficking according to each illegal substance's perceived harmfulness.

1971: President Richard M. Nixon declares the nation's first "war on drugs" and creates an executive branch office to coordinate drug policy.

1973: The Federal Drug Enforcement Administration (DEA) is established.

1978: Law enforcement agencies are authorized by Congress to seize the assets of drug dealers, including money, real estate, and vehicles.

1980s *Harsher antidrug policies are enacted.*

1984: Congress enacts mandatory minimum prison sentences for certain drug offenses

1986: President Ronald Reagan declares a "war on drugs" and announces he will seek stricter laws against the sale and use of illegal drugs. Congress enacts legislation linking the length of mandatory prison sentences to the types of illegal drugs Involved.

1988: Congress passes the Anti-Drug Abuse Act, which stiffens penalties for drug possession and requires the President to issue an annual drug control strategy,

1989: Worldwide heroin production reaches an all-time record. Calling drugs '(the gravest threat facing our nation today, " President George Bush appoints William J. Bennett as the first "drug czar, " or director of the new Off Ice of National Drug Control Policy. U.S. forces invade Panama and capture Gen. Manuel Antonio Noriega, a reputed key figure in the cocaine trade,

1990s *Statistics show a fall in consumption of most illegal drugs.*

1991: The U.S. Supreme Court upholds a Michigan law imposing a mandatory life sentence without the possibility of parole to anyone convicted of possessing more than 650 grams of cocaine,

1993: The U.S. Supreme Court rules that officials may not seize property acquired with the proceeds of illegal drug sales if the owner is unaware of the source of those funds The ruling weakens one of the government's main weapons in the drug war

SOURCE Office of Technology Assessment, 1994, based on "War on Drugs, " The CQ *Researcher,* Mar 19, 1993, vol. 3, No 11

TABLE 2–2: Federal Drug Control Spending by Function, Fiscal Year 1993 to Fiscal Year 1995

	Fiscal year 1993 actual	Fiscal year 1994 enacted	Fiscal year 1995 President's request
	(Budget authority in millions)		
Drug treatment	2,339.1	2,5141	2,8744
Education, community action, and the workplace	1,556.5	1,602,4	2,0507
Criminal justice system	5,685.1	5,700.4	5,9269
International	5234	351.4	4278
Interdiction	1,511 1	1,299,9	1,2056
Research	499.1	5046	5316
Intelligence	150,9	1634	1628
Total	12,265.2	12,1362	13,1798

SOURCE The White House Off Ice of National Drug Control Policy, 1994

OTA has been asked to address a number of questions:

- What are the root causes of substance abuse and addiction?
- Why and how does addiction occur?
- Who are the substance abusers?
- What factors, scientific and social, lead to addiction?
- What are the implications for prevention?

ROOT CAUSES

At the outset, OTA was asked to address the root causes of substance abuse and addiction. The term *root causes* has been used in political discussions and debate (see box 2-1), and although many people have strongly held opinions as to what constitutes the root causes of drug abuse, no consensus exists as to what, if anything, is inherent in every case of substance abuse and addiction. OTA conducted a search of various bibliographic databases, which revealed only limited discussion about root causes of drug abuse (2).

Research into drug abuse looks not at root causes per se, but rather at risk and protective factors that increase or decrease the possibility that substance abuse and addiction will occur (see table 2-4), and how these risk and protective factors affect various subpopulations in different settings.

WHAT ARE SUBSTANCE ABUSE AND ADDICTION?

Drug consumption is divided into three levels or stages commonly distinguished by clinicians and researchers: use, abuse, and dependence (see figure *2-1*). Each of these stages is, on average, more hazardous, more obtrusive, and more likely to provoke or induce social interventions (e.g., punitive sanctions, attention by prevention programs, admission to treatment) than the one before (4). A substance is abusable if it has the capacity to induce dependence in those who use it. Dependence, a term that is often used interchangeably with the term addiction, can include psychological dependence (a form of obsessive behavior whose objective is the attainment of pleasure or the avoidance of unpleasantness) and physical dependence (development of tolerance, causing the user to need increasing amounts of the drug for it to have its desired effect, and withdrawal symptoms if drug use is stopped) (5).

TABLE 2–3: Requesters of OTA Assessment, Technologies for Understanding the Root Causes of Substance Abuse and Addiction

House
Committee on Government Operations
Senate
Committee on Labor and Human Resources
Committee on Governmental Affairs

SOURCE Off Ice of Technology Assessment, 1994

TABLE 2-4: Risk and Protective Factors

RISK FACTORS

Ecological environment

- Poverty
- Living in an economically depressed area with
  - high unemployment
  - inadequate housing
  - poor schools
  - inadequate health and social services
  - high prevalence of crime
  - high prevalence of Illegal drug use
- Minority status involving.
  - racial discrimination
  - culture devalued in American society
  - differing generational levels of assimilation
  - cultural and language barriers to getting adequate health care and other social services
  - low educational levels
  - low achievement expectations from society

Family environment

- Alcohol and other drug dependency of parent(s)
- Parental abuse and neglect of children
- Antisocial, sexually deviant, or mentally ill parents
- High levels of family stress, including financial strain
- Large, overcrowded family
- Unemployed or underemployed parents
- Parents with little education
- Socially isolated parents
- Single female parent without family/other support
- Family instability
- High level of marital and family conflict and/or family violence
- Parental absenteeism due to separation, divorce, or death
- Lack of family rituals
- Inadequate parenting and low parent/child contact
- Frequent family moves

Constitutional vulnerability of the child

- Child of an alcohol or other drug abuser
- Less than two years between the child and its older/younger siblings
- Birth defects, including possible neurological and neurochemical dysfunctions
- Neuropsychological vulnerabilities
- Physically handicapped
- Physical or mental health problems
- Learning disability

Early behavior problems

- Aggressiveness combined with shyness
- Aggressiveness
- Decreased social inhibition
- Emotional problems
- Inability to express feelings appropriately
- Hypersensitivity
- Hyperactivity
- Inability to cope with stress
- Problems with relationships
- Cognitive problems
- Low self-esteem
- Difficult temperament
- Personality characteristics of ego under control, rapid tempo, inability to delay gratification, overacting, etc.

Nevertheless, there is considerable controversy about what constitutes substance abuse and addiction. A number of issues come into play, such as:

- What substance is being used? A wide range of psychoactive substances has the potential for abuse (see box **2-2).** The possession and use of several substances—such as marijuana, heroin, cocaine—are illegal in all 50 states. Other addictive substances—such as tobacco and alcohol—may be legally purchased, possessed, and consumed by a majority of Americans. Other abusable substances—such as inhalants—may

TABLE 2-4 (cont'd.): Risk and Protective Factors

Adolescent problems
- School failure and dropout
- At risk of dropping out
- Delinquency
- Violent acts
- Gateway drug use
- Other drug use and abuse
- Early unprotected sexual activity
- Teenage pregnancy/teen parenthood
- Unemployed or underemployed
- At risk of being unemployed
- Mental health problems
- Suicidal

Negative adolescent behavior and experiences
- Lack of bonding to society (family, school, and community)
- Rebelliousness and nonconformity
- Resistance to authority
- Strong need for Independence
- Cultural alienation
- Fragile ego
- Feelings of failure
- Present versus future orientation
- Hopelessness
- Lack of self-esteem
- Inability to form positive close relationships
- Vulnerability to negative peer pressure

PROTECTIVE FACTORS

Ecological environment
- Middle or upper class
- Low unemployment
- Adequate housing
- Pleasant neighborhood
- Low prevalence of neighborhood crime
- Good schools
- A school climate that promotes learning, participation, and responsibility
- High-qualty health care
- Easy access to adequate social services
- Flexible social service providers who put client's needs first

Family environment
- Adequate family income
- Structured and nurturing family
- Parents promote learning
- Fewer than four children in family
- Siblings 2 or more years apart in age
- Few chronic stressful life events
- Multigenerational kinship network
- Nonkin support network, e.g., supportive role models, dependable substitute childcare
- Warm, close personal relationship with parent(s) and/or other adult(s)
- Little marital conflict
- Family stability and cohesiveness
- Plenty of attention during first year of life
- Sibling as caretaker/confidante

Constitutional strengths
- Adequate early sensorimotor and language development
- High intelligence
- Physically robust
- No emotional or temperamental Impairments

Personality of the child
- Affectionate/endearing
- Easy temperament
- Autonomous
- Adaptable and flexible
- Positive outlook
- Health expectations
- Self-esteem
- Self-discipline
- Internal locus of control
- Problem-solving skills
- Socially adept
- Tolerant

SOURCE U S Department of Health and Human Services, Office for Substance Abuse Prevention, *Breaking New Ground for Youth at Risk: Program Summaries,* OSAP Technical Report 1, DHHS Publication No. (ADM) 91-1658 (Washington, DC 1991)

be legally purchased, possessed, and consumed by anybody.

- Does experimental use constitute abuse? Some maintain that any use of an abusable or addic-

BOX 2-1: Root Causes: Two Views From the Political Arena

"Many states and cities are on shoe-string budgets and must provide services and alternatives to substance abuse in local communizes. The failure to address the fundamental causes of substance abuse and to provide Immediate intervention strategies will impact city residents most The committee recommends that the National Drug Control Strategy be framed by broader social and economic problems which require dramatic reforms in order to attack the root causes of substance abuse We need to begin to build the infrastructure necessary to improve the quality of treatment services by requiring medical schools to provide comprehensive training to identify and treat substance abusers, provide adequate treatment services at the community level, including after care, vocational, educational, and psychiatric assessments, and develop alternate leisure activities for youth and adults to replace 'street life' and assist individuals to escape the drug culture "

House Committee on Government Operations committee report

"One of [the Democrats'] tactics was to talk about the root causes of drug use, the 'deeper and more profound problems, ' as they put it, of hopelessness, poverty, helplessness, and the like The elites liked this shift in emphasis, too. It took the discussion away from moral considerations to the (for them) more comfortable ground of social theory They wanted to talk about 'hopelessness' as a condition caused by lack of government involvement. We talked about hopelessness, too, but talked about it as a condition caused by social decomposition and the breakdown of the family and a lack of law and order in these communities I found it shocking and disappointing that when we argued for more police, jails, courts, and prisons because of the exploding crime epidemic in some of America's inner cities, some people responded by saying, 'But what are the root causes of this? 'That's an interesting debate which should go on at an elite university But if there are drug dealers going around shooting people in the affluent suburbs, the citizenry will not call for a seminar on root causes. They will raise hell and demand that the dealers be arrested And they are right to do SO. "

William Bennett
Former director, U.S Office of National Drug Control Policy

SOURCES U S House of Representatives, Committee on Government Operations, H.Rept 101-992, "The Role of Demand Reduction in the National Drug Control Strategy", Bennett, W, *The De-Valuing of America The Fight for Our Culture and Our Children (New* York, NY Summitt Books, 1992)

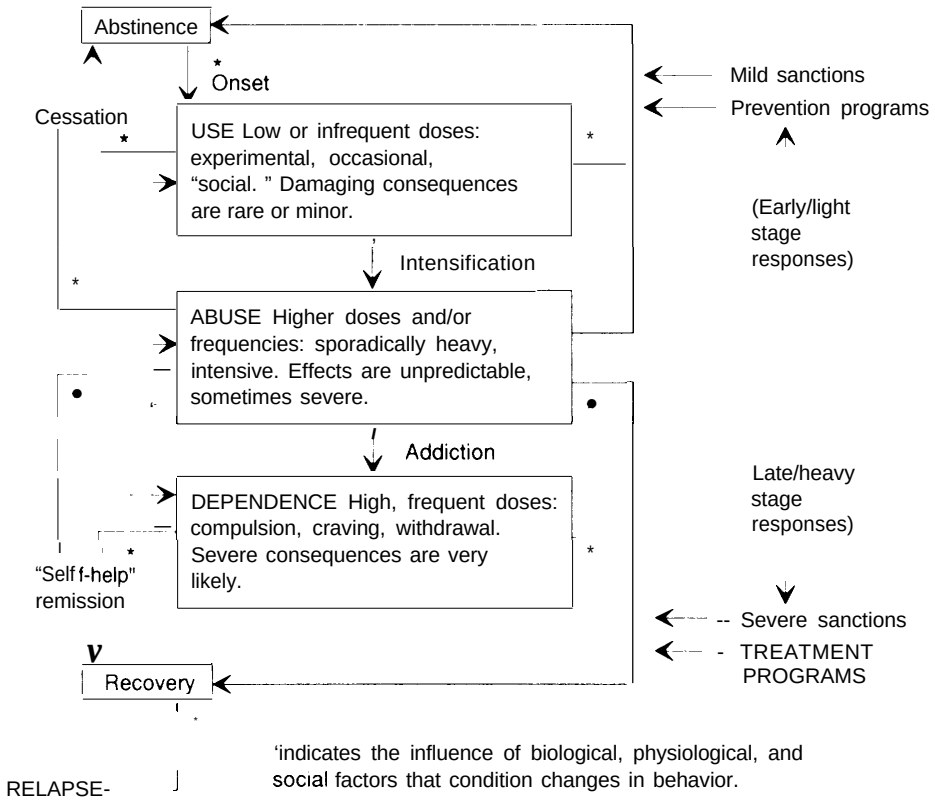
tive substance constitutes abuse. Others suggest that experimentation—particularly with such psychoactive substances as alcohol or tobacco that are available for purchase by adults of legal age—is part of normal development and does not necessarily have harmful consequences.

- In what context are substance abuse and addiction being addressed? Four broad arenas that encounter substance abuse related issues include: mass communications, criminal justice, medicine, and public health. These entities often operate independently of one another, and use substantially different terms when describing the use of illicit substances or the illegal use of licit substances (see appendix C).

Public Health Model

The traditional public health model incorporates the host-agent-environment relationship. Each of these factors has an individual, as well as an interrelated role in the potential use and/or harmful use of a substance. Host factors may include possible genetic, psychological, and biological susceptibility. Agent factors incorporate the substance's abuse liability capacity, as well as how the substance is marketed. Lastly, environmental factors

FIGURE 2–1: Drug Use, Abuse, and Dependence



SOURCE: Institute of Medicine 1993

encompass not only the availability of the substance, but the social, cultural, political, and economic climate as well. The focus of the public health perspective is to understand the importance social norms, environment, and availability play in the shaping of alcohol- and drug-related problems both on an individual and societal level.

The public health approach toward substance abuse has several defining characteristics:

- The substance abuse problem is primarily one of health, and risks for ill-health. In every recreational, mood-altering drug user, use increases the risk of contracting one or more diseases or conditions damaging to one's health. Drug use always creates the potential, from great to small, for developing one or more drug-related health problems.
- The legality or illegality of a drug is an artificial barrier that is not as relevant as the health-related considerations stemming from all types of drug use. Rather than using legal/illegal, the public health approach categorizes drugs by such characteristics as addictive potential and long-term health risks.
- The drug abuse problem and the drug-related crime problem are not one and the same. As two distinct, interrelated problems, they have different, interrelated solutions.
- Dealing with the drug problem primarily as a moral problem is considered inappropriate and counterproductive.

BOX 2-2: Overview of Alcohol and Some Other Psychoactive Substances

Class of psychoactive substance[a] — Description[b]	Examples
ALCOHOL (ethyl alcohol) Alcohol, one of the most widely used of all drugs, is a central nervous system depressant with effects similar to those of sedative-hypnotic compounds (see below). At low doses, alcohol may be associated with behavioral excitation thought to be due to the depression of inhibitory neurons in the brain. Alcohol differs from sedative-hypnotic compounds in that it is used primarily for recreation or social rather than medical purposes.	1 Beer. 2 Wine. 3 "Hard" liquor (e.g , whiskey, gin)
SEDATIVES, HYPNOTICS, OR **ANXIOLYTICS** Sedative-hypnotics are drugs of diverse chemical structure that exert a nonselective general depressant on the central nervous system In addition, they reduce metabolism in a variety of tissues in the body, depressing any system that uses energy. Depending on the dose, any sedative hypnotic compound may be classified as a sedative (an agent that allays excitement), a tranquilizer (an antianxiety agent), a hypnotic (a sleep-inducing agent), or an anesthetic (an agent that eliminates pain). Sedative-hypnotics are used medically as sedatives, anxiolytics (antianxiety agents), hypnotics, antiepileptics, muscle relaxants, and general anesthetics.	1 Barbiturates ("downers" or "barbs"): pentobarbital sodium [Nembutal®], secobarbital sodium ISeconal®], amobarbital IAmytal®]—taken orally. 2 Nonbarbiturate hypnotics: methaqualone IQuaaludes®]—taken orally. 3. Tranquilizers: diazepam [Valium®], chlordiazepoxide hydrochloride [Librium®]–taken orally.
CANNABIS **(THC)** THC (tetrahydrocannabinol) the active agent in marijuana, alters perceptions, concentration, emotions, and behavior, though the mechanisms of action are not entirely clear. Researchers have found, however, that THC changes the way in which sensory information is processed by the brain. It can be used medically to relieve nausea and side effects of chemotherapy in cancer patients; it is very rarely used to treat glaucoma.	1. Marijuana ("pot" or "grass")—smoked or eaten. 2. Hashish ("hash' ')-smoked or eaten. 3. Hashish oil ("hash oil")—smoked (mixed with tobacco. 4. Tetrahydrocannabinol (THC)—taken orally in capsules.
NICOTINE Nicotine, obtained naturally from tobacco, is a central nervous system stimulant.[c] It exerts its action secondary to stimulation of certain cholinergic (excitatory) synapses both within the brain and in the peripheral nervous system.	1. Cigarettes. 2. Smokeless tobacco (e g , snuff or chewing tobacco).

(continued)

BOX 2-2 (cont'd.): Overview of Alcohol and Some Other Psychoactive Substances

Class of psychoactive substance[a] Description[b]	Examples
COCAINE	
Cocaine, obtained naturally from coca leaves, is a potent central nervous system stimulant [c] It stimulates the sympathetic nervous system, which regulates the activity of cardiac muscle, smooth muscle, and glands It also produces bronchodilation in the lungs It is used medically as a topical anesthetic for surgical procedures	1 Cocaine hydrochloride powder ("coke" or "street cocaine")—usually snorted or injected intravenously. [d] 2. Cocaine alkaloid ("freebase" or "crack' ')-smoked .[e]
AMPHETAMINES AND RELATED **STIMULANTS**[f]	
1 Amphetamines	
Amphetamines are a group of three closely related compounds, all of which are potent central nervous system and behavioral stimulants [c] Some amphetamines are used medically to treat attention deficit disorder or minimal brain dysfunction in children, narcolepsy (recurrent, uncontrollable, brief episodes of sleep), or (rarely) depression	1 Amphetamine ("speed" or "uppers" (Benzedrine[R]—taken orally, injected, or snorted [g] 2. Methamphetamine ("speed" or "crystal meth" or "ice") [Methadrine [R]–taken orally, injected, or snorted [g,h] 3. Dextroamphetamine [Dexedrine[R]—taken orally, or rejected
2 Nonamphetamme stimulants	
Like amphetamines, nonamphetamine stimulates are central nervous and behavioral stimulants Some non-amphetamine stimulants (e g , Preludin[R]) are used for weight control, and some (e g , Ritalin[R] and Cylert[R]) are used medically to treat hyperactivity, minimal brain dysfunction, narcolepsy, or (rarely) depression.	1 Pheumetrazine hydrochloride IPreludin [R]—taken orally or injected [d] 2 Methylphenidate hydrochloride injected [d] 3 Pemoline[Cylert[R]]—taken orally [Ritalin[R]]—taken orally, or injected [d]
HALLUCINOGENS	
Hallucinogens, or psychedelics, are a heterogeneous group of compounds that affect a person's perceptions, sensations, thinking, self-awareness, and emotions. '	1 LSD (lysergic acid diethylamide) or "acid' '-taken orally or put in the eyes. 2. Mescaline (3,4,5-trimethy lox-phenylethyl amide) or "mesc" and peyote-disks chewed, swallowed, or smoked, tablets taken orally. 3. Psilocybin ("magic mushrooms")-chewed and swallowed. 4 MDMA (methylene dioxymethamphetamine)—taken orally.

(continued)

BOX 2-2 (cont'd.): Overview of Alcohol and Some Other Psychoactive Substances

Class of psychoactive substance[a] Description[b]	Examples
INHALANTS	
Inhalants are chemicals that produce psychoactive vapors, Although different in makeup, nearly all of the abused inhalants produce effects similar to those of anesthetics, which act to slow down the body's functions or produce feelings of dizziness. At low doses, users may feel slightly stimulated. Amyl nitrite is used for heart patients because it dilates the blood vessels and increases blood supply to the heart. There are no medical indications for most of the inhalants	1. Solvents (model airplane glue, nail polish remover, lighter and cleaning fluids, and gasoline) —vapors inhaled, 2. Aerosols (e.g , paints, hairsprays)—vapors inhaled 3. Some anesthetics (e.g,nitrous oxide) —vapors inhaled 4. Amyl nitrite ("snappers" or "poppers") and butyl nitrite ("rush' ')-vapors inhaled.
OPIATES (NARCOTICS) AND RELATED ANALGESICS	
Opiates are natural or synthetic drugs that, like morphine, a substance derived from the opium poppy, have analgesic (pain-relieving) properties Heroin is not approved for medical uses in the United States. The major medical use of other opiates is for the relief of pain (i e , as analgesics); some narcotics are used to relieve coughing (i. e., as antitussives) or to treat diarrhea Methadone is used in the treatment of narcotic abstinence syndromes and as an analgesic in terminal illness	1. Heroin ("smack" or "horse")—injected, smoked, or inhaled[d]. 2. Codeine (codeine sulfate) —taken orally or injected [d] 3 Morphine (morphine hydrochloride)—injected, smoked, or inhaled. 4 Synthetic opiates (e g., methadone [Dolophine[R]]); hydromorphone hydrochloride [Dilaudid[R]], meperidine hydrochloride [Demerol[R]], oxycodone and asprin [Percodan[R]]—taken orally or injected,
PCP (PHENCYCLIDINE) AND SIMILARLY ACTING SYMPHATHOMIMETICS	
Phencyclidine, commonly referred to as PCP, alters the functions of the neocortex and has been called a dissociative anesthetic. It was developed in the 1950s as an anesthetic but was subsequently taken off the market in 1967 when it was discovered that the drug caused hallucinations in some people.l PCP is now used legally only in veterinary medicine as an immobilizing agent.	PCP ("angel dust" or "lovely ")-taken orally, or smoked (sprayed on joints or cigarettes) [d]

[a]According to Julien, one could conceivably classify psychoactive drugs by at least three methods 1) mechanism of action, 2) chemical structure, and 3) behavioral effects Probably the most useful approach would be to classify them by mechanism of action, but knowledge of the brain's physiology is too limited for this approach to be comprehensive A limitation of the second approach is that many drugs of apparently similar structure exert quite different effects, and many drugs of dissimilar structure exert quite similar effects The classification in this table largely reflects the behavioral effects approach. The classification used here is based on the categories in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed , revised According to the American Psych iatric Association, all of the classes of psychoactive substances listed in this box except nicotine are associated with both abuse and dependence Nicotine is associated with dependence but not abuse

(continued)

BOX 2-2 (cont'd.): Overview of Alcohol and Some Other Psychoactive Substances

[b]The potential physiological, psychological, and behavioral effects of using the psychoactive substance shown are discussed in the sources listed below The consequences depend in part on the specific drug used, the dosage level and mode of administration

[c]*Central nervous system stimulants* are drugs that can elevate mood, Increase alertness, reduce fatigue, provide a sense of Increased energy, decrease appetite, and improve task performance They can also produce anxiety, insomnia, and irritability The drugs differ widely in their molecular structures and mechanisms of action

[d] According to the American Psychiatric Association, the route of administration of a psychoactive substance is an important variable in determining whether use will lead to dependence or abuse In general, routes of administration that produce more efficient absorption of the substance in the blood stream (e g , Intravenous injection) tend to Increase the likelihood of an escalating pattern of substance uses that leads to dependence Routes that quickly deliver psychoactive substances to the brain (e g , smoking or Intravenous injection) are associated with higher levels of consumption and with an Increased likelihood of toxic effects Use of contaminated needles for intravenous administration of amphetamines, cocaine, and opiates can cause hepatitis, HIV Infection, and other Illnesses

[e]Freebase *cocaine* is a form of cocaine made by converting "street cocaine" (cocaine hydrochloride) to a purified base that is smoked The effect of smoking freebase is similar to that of Intravenous injection but smoking provides a shorter more Intense high than sniffing or Ingestion because of the rapid absorption of the drug through the lungs *"Crack cocaine"* is the street name given to freebase cocaine that has been processed from cocaine hydrochloride to a chemical base by cooking it with baking soda and water The term crack refers to the cracking sound that is heard when the mixture is smoked (heated), presumably due to the sodium bicarbonate

[f] Describing a drug as a stimulant does not adequately describe its properties Drug use surveys typically mean amphetamines when they use the word stimulants Some surveys regard as stimulants both prescription (amphetamines) and nonprescription substances (e g caffeine-based compounds used in No-Doz, diet pills, and "fake pep pills") Cocaine and nicotine (described above) are also central nervous system simulants

9 According to the National Institute on Drug Abuse, *designer drugs* are structural analogs of substances scheduled under the Controlled Substances Act that are prepared by underground chemists to mimic the psychoactive effects of controlled substances or produce other psychoactive effects Because such analogs are not identical to their parent compound, their manufacture and distribution does not violate the law As of June 1986, there were synthetic analogs of PCP, fentanyl and meperidine, and amphetamine and methamphetamine

[h]In the past, abuse of methamphetamine had been in the form of tablets or Intravenous injection More recently, "ice" (one of the common street names for *d*-methamphetamine hydrochloride) has gained popularity in a form suitable for smoking

Most of the agents in this class of drugs can induce hallucinations if the dose is high enough But the term hallucinogen does not adequately describe the range of pharmacological actions of the diverse group of substances usually Included in the class The term psychedelic was proposed by Osmond in 1957 to imply that these agents all have the ability to alter the sensory perception and thus may be considered "mind expanding " The effects of hallucinogens are unpredictable and depend on the amount taken, the user's personality, mood and expectations, and the surroundings in which the drug is used

[j]PCP is considered a hallucinogen in some surveys of drug use

SOURCES Off Ice of Technology Assessment, 1991, based on the following sources American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed revised (Washington, DC 1987), R M Julien, *A Primer of Drug Act/on,* 5th ed (New York, NY W H Freeman and Co , 1988), J F Kauffman, H Shaffer, and M Burglass, "The Biological Basics Drugs and Their *Effects," Alcoholism and Substance Abuse Clinical Interventions* (New York, NY 1985), U S Department of Health and Human Services Public Health Service, Alcohol, Drug Abuse and Mental Health Administration, National Institute on Drug Abuse, "Hallucinogens and PCP Inhalants, Marijuana, Opiates, Sedattve-Hypnotics, Stimulants, and Cocaine, " Rockville, MD, 1983, U S Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Designer Drugs, " *N/DA Capsules*, Rockville, MD, June 1986, U S Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Marijuana Update " *N/DA Capsules*, Rockville, MD, May 1989, U S Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Methamphetamine Abuse, " *N/DA Capsules*, Rockville MD, January 1989, and U S Department of Education, *Growing Up Drug Free A Parent's Guide to Prevent/on* (Washington, DC 1989)

Medical Model

Within the fields of medicine, the two most frequently cited texts for the definitions of substance abuse and dependence are the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* issued by the American Psychiatric Association and used widely in American medical practice, and the *International Classification of Diseases (ICD)* published by the World Health Organization (WHO).

The current ICD and DSM definitions of substance dependence are nearly identical. However, the two manuals differ sharply on the concepts of abuse, which DSM classifies as a maladaptive pattern of substance use leading to impairment or distress, as manifested by one or more of several events occurring over the same 12-month period (e.g., failure to fulfill major role obligations at work, school, or home; recurrent substance-related legal problems, such as arrests for substance-related disorderly conduct. The current ICD- 10 category of *harmful use,* while applicable cross-culturally, is limited to a pattern of psychoactive substance use that is causing damage to health. The damage may be physical, as in cases of hepatitis from the self-administration of injected drugs, or mental, such as episodes of depressive disorder secondary to heavy consumption of alcohol (see appendix C for a full discussion of DSM and ICD definitions).

Criminal Justice Model

While it is well-known that many crimes are committed by persons with substance use disorders and that these disorders can be major contributors to their crimes, the criminal justice system has no systematic policy for the evaluation of these disorders. In many jurisdictions, whether federal, state, or local, the prevailing sentiment is that *any use* of an illicit substance and/or use of a licit substance in an illegal manner is considered criminal abuse. A limited set of quantitative analyses including blood, urine, and breath tests can be performed to detect illegal levels of alcohol and/or the presence of illicit substances. Besides the limited amount of testing and evaluation, psychological screening examinations or structured interviews are used infrequently to determine the level and severity of use, abuse, or dependence.

For purposes of this report, OTA does not adopt any single definition for the terms *substance* ***abuse*** or *substance addiction/dependence. The* focus of this report, the underlying causes of substance abuse and addiction, relates to each of the definitions discussed above.

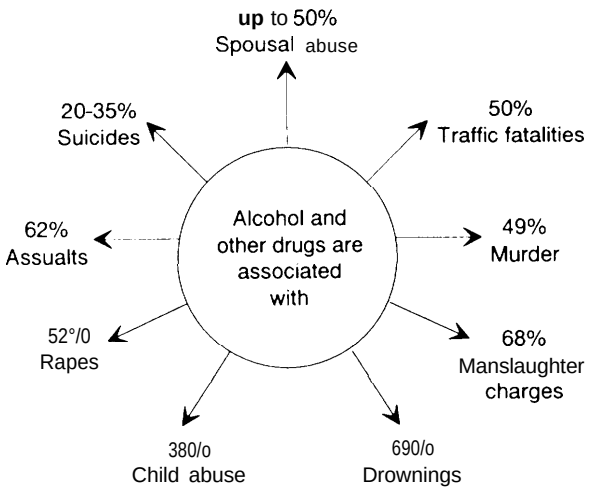
MAGNITUDE OF THE PROBLEM

The abuse of licit and illicit drugs represents a major public health problem in the United States. Abuse of alcohol and other drugs has been associated with many problems (see figure 2-2) costing Americans an estimated $144.1 billion annually.

Federal survey data estimate that 11.4 million Americans aged 12 and older used illegal drugs in 1992, continuing a steady decline from a peak of 24 million in 1979. Findings from the 1992 National Household Survey found the following about specific drugs:

- **Illegal drugs.** Since 1979, overall rates of current use (defined as use within the last 30 days) have dropped in all age groups, except those aged 35 and older, whose use of drugs has remained level. This has resulted in a general shift in the age distribution of illegal drug users. In 1992, 23 percent of illegal drug users were aged 35 and older, compared with only 10 percent in 1979.
- **Cocaine. The** number of cocaine users decreased 31 percent from 1.9 million users in 1991 to 1.3 million in 1992. This is down from a peak of 5.8 million in 1985. The number of occasional users (defined as those who used the drug in 1992 but less often than monthly) also continued a sharp decline from 4.3 million in 1991 to 3.4 million in 1992. This is down from a peak of 8.6 million in 1985. Frequent use of cocaine (defined as use on a weekly basis) remained unchanged between 1991 and 1992. In fact, no significant change has occurred in this number since it was first estimated in 1985.

FIGURE 2–2: Association of Alcohol and Other Drugs With Problems



SOURCE Off Ice of Substance Abuse Prevention, 1991

- **Marijuana.** This is the most common illegal drug—used by 78 percent of all illegal drug users in 1992.
- **Other illegal drugs. No** major changes in the prevalence of the use of hallucinogens, such as lysergic acid diethylamide (LSD) and phencyclidine (PCP), between 1991 and 1992. The survey estimates that approximately 1.8 million Americans have used heroin at least once. However, the data on these categories are somewhat unreliable, as these users are less likely to be contacted and reported in a household survey.
- **Alcohol.** In 1992, approximately 98 million persons over the age of 12 had used alcohol in the last month, which is approximately 48 percent of the population aged 12 and older. This number is down from an estimated high of 106 million drinkers in 1988. The number of heavy drinkers (defined as having five or more drinks per occasion on five or more days in the past month) has remained steady at an estimated 9 million people.
- **Tobacco.** An estimated 54 million Americans were smokers in 1992, a rate of 26 percent of the population aged 12 and older. Cigarette smoking has declined since 1988, when an estimated 57 million Americans smoked cigarettes.
- **Smokeless tobacco.** An estimated 7.5 million Americans used smokeless tobacco in 1992, the vast majority of whom (7.1 million) were males.
- **Inhalants. The** use of inhalants (e.g., gasoline, glue, and nitrites) dropped slightly in 1992 as compared to 1991.
- **Prescription drugs. The** estimated current nonmedical use of psychotherapeutics (sedatives, tranquilizers, stimulants, or analgesics) dropped from 1991 to 1992.

The survey also provides demographic variables useful to understanding substance use and abuse in the United States (see box 2-3). However, these figures, as all data on drug use, are suspect. Most surveys have strengths and weaknesses, which have led stakeholders and policy makers to make widely divergent conclusions based on the same sets of data.

MEASURING SUBSTANCE USE AND ABUSE

Like the old fable about blind men describing an elephant, individual drug statistics usually tell us only part of the story (13). Each survey provides useful information, but at the same time, each survey is flawed. Currently, no single measurement can by itself describe drug use and abuse in all its complexity. Nonetheless, several useful indicators do provide information to policy makers.

Three major national drug monitoring systems are the primary data source for this review: The National Household Survey on Drug Abuse (the Household Survey), the National Survey of High School Seniors (the Seniors Survey), and the Drug Abuse Warning Network (DAWN). These continuing data series have been sponsored by the National Institute on Drug Abuse (NIDA) since the 1970s. Supplementary data sources include the few small area studies that compare drug use by poverty or income status and the Drug Use Forecasting System (DUF), sponsored by the National

BOX 2–3: Household Survey Demographic Portrait

According to the 1992 National Household Survey on Drug Abuse

- Illegal drug use is most prevalent in the 18- to 25-year age group
- Most Illegal drug users are in the white population (76 percent of all current users or 87 million people)
- Men have a higher rate of current illegal drug use than women
- Illegal drug use is highly correlated with educational status Those who had not completed high school had the highest rate of use
- Unemployed people are twice as likely as employed people to be using Illegal drugs.
- The prevalence of Illegal drug use in large metropolitan cities is slightly higher than in nonmetropolitan areas

SOURCE Off Ice of Technology Assessment, 1994, based on U S Department of Health and Human Services data

Institute of Justice, which provides quarterly esti mates of drug use among the criminal population in selected cities.

National Household Survey on Drug Abuse

Since 1974, NIDA has commissioned the Household Survey every one to three years. The survey is based on a multistage random sample of the household population in the 48 contiguous United States. The sample excludes persons living in group quarters, including institutions, prisons, military quarters, and college dormitories, and those with no permanent address, including the homeless.

Since 1985, a number of enhancements have been made to the Household Survey. In 1985, blacks and Hispanics were oversampled to provide additional cases for subgroup analyses, and new measures of drug use frequency were introduced to identify persons who used drugs monthly and weekly during the previous year. In 1991, special supplementary samples were added for six metropolitan areas with highly publicized drug problems. Similarly, reports published since the early 1980s provide greater detail on the demographic characteristics of users by frequency of use.

National Survey of High School Seniors

Every year since 1975 researchers at the University of Michigan have surveyed a nationally representative sample of approximately 16,000 high school seniors. Beginning in 1976, a followup survey of members from each graduating class, including an over-sampling of drug users, has been conducted by mail. In 1990, the followup sample included young adults aged 19 to 32.

Drug Abuse Warning Network

DAWN, established in 1972, is the federal government major data system for tracking patterns and trends in the serious health consequences of drug use. DAWN reports include statistics on the total number of hospital emergency room visits (episodes), separate counts of the number of drugs mentioned per episode (drug mentions), and drug-related deaths.

Throughout the 1970s and 1980s, the DAWN program focused primarily on data from emergency rooms and medical examiners in 27 metropolitan areas. The selection of reporting facilities, over 700 emergency rooms and 87 medical examiners by 1989, was not random, however, and the number of facilities reporting varied from year to year, with facilities in metropolitan areas being overrepresented. Beginning in 1990, DAWN implemented a national probability sample for the collection of drug-related emergency room visit data to allow reporting of national as well as metropolitan area information.

Drug Use Forecasting System

DUF, initiated in 1988 by the Department of Justice, provides estimates of drug use among booked arrestees in selected cities based on urinalysis tests. The tests, administered shortly after arrest, measure very recent drug use among

lawbreakers. Four times a year, samples of about 250 male adult arrestees in participating cities are tested; some areas also test female arrestees and juveniles. The proportion of persons arrested explicitly on drug charges is limited to 25 percent of the total sample.

Limitations of the Data

The national drug monitoring surveys have several limitations for studying drug use, abuse, and addiction:

- Most surveys rely on self-reporting. The results of such surveys rely on the veracity of the person responding to the survey. A major, and widely recognized, limitation in the national surveys is that respondents may be unwilling or unable to report their drug use accurately. Comparisons of self-report and urinalysis results based on DUF data indicate that, among arrestees, the tendency to underreport drug use is substantial (12). As one Member of Congress noted, "how in the hell can you expect people who live in households to share with anybody, let alone the government, how often they use drugs?" (3).
- Surveys miss populations at risk for drug abuse. The Household Survey, by definition, excludes certain groups who do not reside in households, such as the homeless and persons in jail or prison. Although the excluded groups represent only 2 percent of the total population, drug use may be higher, or different, among excluded groups such as the homeless and jail or prison inmates. The Household Survey may also fail to capture drug users within the target population. Although overall survey response rates are high (82 percent in 1990), drugs users may have been more difficult to locate and interview because their lifestyles may involve irregular hours, avoiding authority, and other behaviors that reduce the likelihood of survey response. In addition, response rates tend to be generally lower among young adults and residents of metropolitan and low-income areas, and those not interviewed may be more likely to use drugs than those who respond to the survey.
- **Poverty indicators per se are not available. The** national drug monitoring systems contain very limited data on poverty, and none that meet the official poverty definition (in 1991, the poverty thresholds varied from $6,932 for a person living alone to $27,942 for a family of nine or more members (6). The proxy variables relating to employment, education, place of residence, and race and ethnic it y unsuccessfully separate the effects of income from the effects of other correlated factors. Information on drug use by income status is available only in the most recent Household Surveys, and then only by family income without regard to household size. More information is provided by the Household Survey on other variables related to poverty, including employment status, race and ethnicity, and neighborhood characteristics. The Seniors Survey provides no income data. For high school seniors, the only regularly reported indicators of socioeconomic status are college plans and parental education. No socioeconomic indicators are available for the followup sample of young adults except current enrollment in college. Race and ethnic status are not regularly reported for either sample, but for high school seniors racial and ethnic patterns of drug use are analyzed and published separately. DAWN has severe limitations for an analysis of poverty and drug use. The only indicators in DAWN related to poverty are race and ethnicity. No data are available on income status of patients or the economic status of areas served by the facility.
- Surveys may over- and underrepresent findings regarding populations at risk for drug abuse. Populations at risk for both poverty and drug abuse, for example, are excluded or underrepresented in the major surveys and overrepresented in reports from hospital emergency rooms. These problems mean that the findings from these surveys are suggestive rather than definitive (see box 2-4).
- Drug measures focus on use, rather than abuse or addiction. The common measures of drug use employed by the Household and Seniors Surveys-lifetime, past year, and past month

BOX 2-4: Two Contrasting Surveys Measuring Cocaine Use

Because of populations not represented in the Household Surveys (including homeless, run-away children, and institutionalized populations such as the incarcerated), the surveys may greatly underestimate the involvement of the poor in drug use. Two years ago, for example, Abt Associates conducted a study to determine the number of heavy cocaine users in the United States. Two measures of heavy cocaine use were employed, both of which measured use of cocaine in the very recent past Estimates of the number of regular weekly cocaine users from the 1990 Household Survey were compared to estimates of the number of recent cocaine users based on urinalysis tests of arrestees from the Drug Use Forecasting (DUF) program. DUF urinalysis tests were conducted at the time of booking, and the results measured cocaine use during the day or two before arrest. DUF estimates therefore measured the prevalence of very recent drug use among those involved with the criminal justice system in selected major cities

The two data systems generated significantly different estimates. From the Household Survey, Abt estimated that there were about 662,000 heavy cocaine users in this country in 1990. This is substantially lower than the Abt estimate of 1.709 million heavy cocaine users derived from DUF data. Reasons for the differences include both possible underreporting on the Household Survey and the fact that many heavy cocaine users may be excluded from the household population or may be exceedingly difficult to locate and interview. Overall, the study indicated that approximately two-thirds of the heavy cocaine users in this country are not counted by the Household Survey and that approximately 87 percent of all heavy cocaine users are involved with the criminal justice system

SOURCE Office of Technology Assessment, 1994, based on Abt Associates, *Heavy Cocaine Use in the United States The Number of Users* (Washington, DC Abt Associates, 1991)

use—are insufficiently refined to distinguish between casual and dependent drug use. Definitions of alcohol, drug abuse, and dependency —such as those set forth in DSM (1)—link the quantity and frequency of use to indications of persistent, uncontrolled consumption, impaired social and psychological functioning as a result of use, and physical problems including withdrawal symptoms. No published estimates of the number of drug users meeting medical criteria for abuse or dependence by poverty indicators are available, with the single exception of the DAWN estimates of emergency room contacts for dependency, which are reported by race and ethnicity.

- The surveys include few multivariate analyses. Since the surveys do not examine variables while controlling for factors related to drug use, an accurate link of drug use with the role of income, race, education, and place of residence is impossible. The dearth of such analyses results in part from sample size limitations and in part from the fact that secondary analyses of the national survey data have not been encouraged.

ORGANIZATION AND SCOPE OF THE REPORT

This report has four parts: necessary preconditions, individual factors, community contexts, and policy options.

The first part, *Necessary Preconditions* (chs. 3-5), focuses on several factors necessary for substance abuse to occur. The second part, *Individual Factors* (ch. 6), explores research conducted on risk and protective factors thought to be indicators in assessing an individual's substance use, abuse, and addiction. The third part, *Activity Settings* (chs. 7 and 8), looks at how risk and protective factors play out in various population subgroups and in various community settings (home, school, workplace, recreation, and neighborhood). The fourth section, *Policy Options* (ch. 9), addresses

the range of legislative issues and options for Congress arising from chapters 3 through 8.

This report focuses on factors that contribute to or protect against substance abuse and addiction, and the implications for prevention. It does not address in any depth drug treatment or law enforcement issues and interventions. Based on the literatures reviewed by OTA about causes and prevention, however, it is clear that comprehensive prevention strategies will generally need drug treatment and law enforcement components, if they are to be effective. While drawing on data from federal antidrug prevention programs, the effectiveness of such approaches needs to be studied in greater depth than was possible in this report.

This report is the second and final publication of this assessment, The first publication, a background report on *Biological Components of Substance Abuse and Addiction,* described genetic, pharmacological, and abuse liability research issues (9). Readers are also referred to earlier OTA reports that address issues related to drug interdiction efforts (10); alcohol, tobacco, and drug abuse prevention and services issues in adolescent health (7); the effectiveness of drug abuse treatment in controlling AIDS/HIV infection (11); and alternative coca reduction strategies (8).

Part I: Necessary Preconditions

No single or generic set of variables explains the misuse of alcohol and other drugs for every individual; in other words there are no "root causes" for substance abuse which universally apply to everyone. However, three major preconditions must be present in order for substance abuse and addiction to occur:

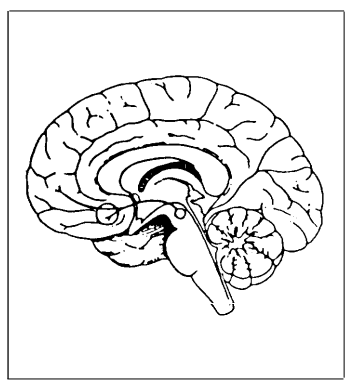
- biology and pharmacology;
- availability; and,
- drug use, with transitions to abuse and dependency.

Chapters 3,4, and 5 discuss these three preconditions in greater detail.

Biology and Pharmacology 3

Substance abuse and addiction are complex phenomena that defy simple explanation or description. A tangled interaction of factors contribute to an individual's seeking out, use, and perhaps subsequent abuse of drugs. Since more individuals experiment with drugs than eventually develop substance abuse problems, great interest persists in understanding what differentiates these groups. Factors that can play a role in drug abuse susceptibility include a person's psychological makeup (e.g., self-esteem, propensity to take risks, impulsivity, depression), biological response to drugs, environmental situation (e.g., peer groups, family organization, socioeconomic status), and the availability of drugs. The exact combination of elements that lead to substance abuse varies among individuals.

Underlying all substance use, abuse and addiction are the actions and effects that drugs of abuse exert. For a complete understanding of drug abuse and addiction one must address how drugs affect the brain, why certain drugs have the potential for being abused, and what, if any, biological differences exist among individuals in their susceptibility to abuse drugs. While many other factors ultimately contribute to an individual's drug-taking behavior, understanding the biological components is crucial in understanding substance abuse, addiction, and dependency.



Two biological factors contribute to substance use, abuse, and addiction: the effects drugs of abuse exert on a person; and the biological status of the individual taking drugs. The former relates to the acute mechanisms of action of drugs in the brain and the long-term effects that occur after chronic exposure. The latter pertains to an individual's biological constitution, most importantly the presence of inherited characteristics that affect that person's response to a drug.

BOX 3–1: Neuropharmacology

Neurons are the cells that process information in the brain. Neurotransmitters are chemicals released by neurons to communicate with other neurons. When a neuron is activated it releases a neurotransmitter into the gap between two neurons (see figure 3-1). The molecules of the neurotransmitter move across the gap and attach to proteins, called receptors, in the outer wall of an adjacent cell. Once the receptor is activated, the neurotransmitter is removed from the gap, either by reabsorption into the neuron that released it or by being broken down chemically.

For each neurotransmitter in the brain, there are specific receptors to which it can attach Receptors and receptor subtypes can activate a variety of membrane and cellular mechanisms. In this way, one chemical can have diverse effects in different areas of the brain. Many chemicals have been identified as neurotransmitters. Some particularly relevant to the reported pleasurable sensations associated with drug abuse include dopamine, norepinephrine, serotonin, opioids and other neuropeptides, gamma ammo butyric acid (GABA), and glutamate.

A neuron can have thousands of receptors for many different neurotransmitters. Some neurotransmitters activate neurons (excitatory neurotransmitters), while others decrease neuron activity (inhibitory neurotransmitters) Some receptors are biochemically coupled the activation of one modulates the function of the other, either increasing or decreasing its activity. A neuron can also have receptors for the chemical it releases, In this way, neurons can regulate their release of a particular neurotransmitter. Thus, these so-called autoreceptors act as a feedback mechanism. The activity of a neuron will be determined by the cumulative activity of all its various receptors.

Drugs that work in the brain, including drugs of abuse, alter normal neuropharmacological activity through a variety of different mechanisms. They can affect the production, release, or reuptake of a chemical, they can mimic or block the action of a chemical at a receptor. or they can interfere with or enhance the activity of a membrane or cellular mechanism associated with a receptor. Prolonged drug use has the potential to alter each of these processes.

SOURCE Off Ice of Technology Assessment, 1994

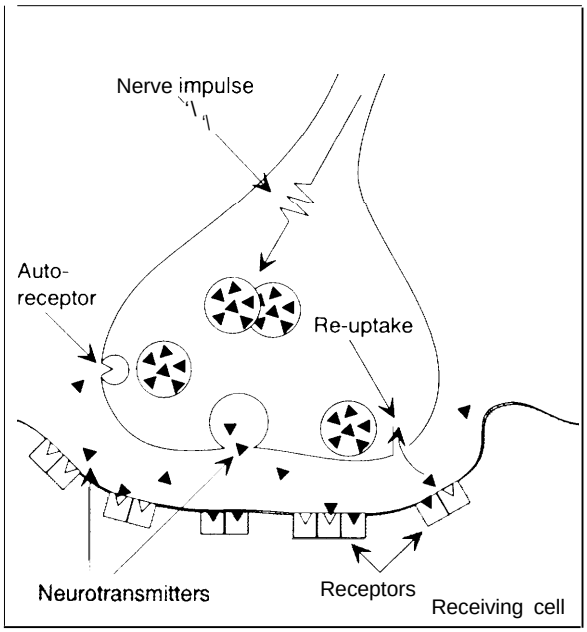
The biological mechanisms of substance abuse are complex and interactive. A previously published background paper by the Office of Technology Assessment (OTA) entitled *Biological Components of Substance Abuse and Addiction* thoroughly discusses the basic concepts, neuropharmacology, and genetics of drug abuse. This chapter is a synopsis of the background paper.

DRUG ACTION

Acute Actions

Drugs of abuse alter the brain's normal balance and level of biochemical activity (see box 3-1). In order to have these affects, a drug must first reach the brain. This is accomplished by the drug diffusing from the circulatory system into the brain. The routes of administration, methods by which a drug enters the bloodstream, affect how quickly a drug penetrates the brain. The chemical structure of a drug plays an important role in the ability of a drug to cross from the circulatory system into the brain. The four main routes of administration for drugs of abuse are oral, nasal, intravenous, and inhalation. With oral ingestion, the drug must be absorbed by the stomach or gut which results in a delay before effects become apparent. When the nasal route of administration is used, effects are usually felt within 3 minutes, as the capillary rich mucous membranes of the nose rapidly absorb substances into the bloodstream. Intravenous administration usually produces effects in 1/2 to 2

FIGURE 3–1: The Synapse and Associated Structures



SOURCE Off Ice of Technology Assessment, 1994

minutes and is slowed only by the detour back through the lungs that venous blood must take to reach the brain. Lastly, the inhalation method bypasses the venous system completely because the drug is absorbed into the pulmonary circulation which goes directly from the 1ungs to the heart and then to the brain. As a result, effects are felt within 5 to 10 seconds, making inhalation the fastest route of administration. The route of administration can determine the drug's potency and the efficacy the drug will have on affecting brain activity, thereby contributing to the abuse potential of the drug.

Distinct from other psychoactive agents, drugs of abuse, in part, affect those areas of the brain that mediate feelings of pleasure and reward (see box 3-2). Evidence is accumulating that positive sensations experienced during these activities are mediated by the brain reward system. Studies have shown that direct stimulation of the areas of the brain involved in the reward system, in the absence of any goal-seeking behavior, produces extreme pleasure that has strong reinforcing properties in its own right (48,60). Animals with electrodes implanted in these areas in such a way that electrical impulses produce a pleasurable sensation will repeatedly press a bar, or do any other required task, to receive electrical stimulation. The fact that animals will forego food and drink or will willingly experience a painful stimulus to receive stimulation of the reward system attests to the powerful reinforcing characteristics of the reward system. Most drugs of abuse, either directly or indirectly, are presumed to affect the brain reward system.

Inducing activity in the brain reward system gives drugs of abuse positive reinforcing actions that support their continued use and abuse. Drug reinforcement is defined as increasing the behavior that led to the taking of the drug. Put more simply, individuals who use drugs experience some effect, such as pleasure, detachment, or relief from distress which initially establishes and then maintains drug self-administration. The consequence of taking the drug enhances the probability that it will continue to be used for some real or perceived effect and, hence, tends to lead to continued compulsive self-administration. In fact, the ability of a drug to support self-administration in experimental animals is a measure of the drug's strength as a reinforcer.

While growing evidence suggests that the brain reward system plays a role in the reinforcing properties of most drugs of abuse, the precise mechanisms involved are complex, vary among substances, and have yet to be completely described (41 ,42,43). For example, while some drugs of abuse directly affect the chemical release of dopamine (see box 3-3), the interactions of other neurotransmitters such as gamma amino butyric acid (GABA), opioid peptides, and serotonin may also be important.

Chronic Actions

Chronic, long-term exposure to drugs of abuse can cause changes in the brain that may take weeks,

BOX 3–2: The Brain Reward System

Eating, drinking, sexual, and maternal behaviors are activities essential for the survival of the individual and the species. Natural selection, in order to ensure that these behaviors occur, has imbued them with powerful rewarding properties. The brain reward system evolved to process these natural reinforcers.

The reward system is made up of various brain structures. A key part of this system for drug reward appears to be the mesocorticolimbic pathway (MCLP). The MCLP is composed of the axons of neuronal cell bodies in the middle part of the brain (i.e., ventral tegmental area) projecting to areas in the front part of the brain (I. e., the nucleus accumbens, a nucleus in the limbic system, a network of brain structures associated with control of emotion, perception, motivation, gratification, and memory; medial prefrontal cortex, part of the front of the brain revolved with higher ordered thinking) (see figure 3-2). Ventral tegmental neurons release the neurotransmitter dopamine to regulate the activity of the cells in the nucleus accumbens and the medial prefrontal cortex. Other parts of the reward system include the nucleus accumbens and its connections with other limbic structures, and other regions in the front part of the brain (i.e., substantia innominata-ventral palladium) The nucleus accumbens also sends signals back to the ventral tegmental area, Finally, other neuronal pathways containing different neurotransmitters regulate the activity of the mesocorticolimbic dopamine system and may also be revolved in mediating the rewarding properties of drugs of abuse.

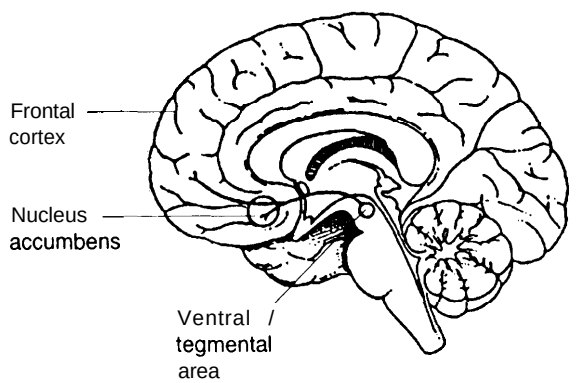
SOURCE Koob, G F, "Drugs of Abuse Anatomy, Pharmacology, and Function of Reward Pathway s," Trends in Pharmacological Sciences 13177-184, 1992, Koob, G F, "Neural Mechanisms of Drug Reinforcement," PW Kalivas and H H Samson (eds), The Neurobiology of Drug and Alcohol Addiction, Annals of the American Academy of Sciences 654171-191, 1992

months, and possibly years, to reverse once drug use has stopped.

Most drugs of abuse have complex actions in the brain and other parts of the body resulting in a variety of behavioral effects. In general, tolerance develops to many of the effects of drugs of abuse and a withdrawal syndrome occurs on cessation after prolonged use. However, the details of these phenomena vary from drug to drug, and the specific details of the biological mechanisms that underlie these phenomena are not completely understood. Recent advances in neuroscience research have begun to unravel how neuroadaptive responses manifest themselves for various drugs of abuse.

Tolerance to a drug develops when, following a prolonged period of use, more of the drug is required to produce a given effect (33,38). This response occurs with many types of drugs. It is a common, but unnecessary, characteristic of drug abuse (see box 3-4). For example, while tolerance develops to some of the effects of cocaine and amphetamines, sensitization can also occur to some of their other effects. Also, while it is unclear from available data whether tolerance develops to cocaine's reinforcing effects, the notion is supported by some experimental evidence and

FIGURE 3–2: The Mesocorticolimbic Pathway



SOURCE Off Ice of Technology Assessment, 1994

BOX 3–3: How Drugs of Abuse Affect the Chemical Release of Dopamine

The rewarding properties of stimulant drugs such as cocaine and amphetamines are due directly to the effects of the chemical dopamine. Opiates, on the other hand, Indirectly stimulate dopamine by activating other chemical pathways, which in turn increase dopamine activity. Similarly, alcohol, barbiturates, and benzodiazepines likely have an Indirect action which Increases dopamine activity All of these drugs have reinforcing properties Phencyclidine (PCP) is also a strong reinforcer but its relationship, if any, to activity in the dopamine pathway has yet to be established. Other drugs are either weak reinforcers or have not been shown to support self -administration in animal experiments. Nicotine stimulates dopamine neurons, however, its effect is modest when compared with cocaine or amphetamine Likewise, caffeine is a weak reinforcer, but the precise mechanisms of its reinforcement are unclear. Finally, cannabis and lysergic acid diethylamide (LSD) also produce positive effects that clearly support their use

SOURCE Office of Technology Assessment 1994

anecdotal reports from cocaine users that the drug's euphoric action diminishes with repeated use. In a recent study, it has been shown that acute tolerance to dopamine response is induced by binge patterns of cocaine administration in male rats (51). Tolerance develops to most of the effects, including the reinforcing properties, of opiates, barbiturates, and alcohol.

Sensitization, the opposite of tolerance, occurs when the effects of a given dose of a drug increase after repeated, but intermittent, administration. Sensitization to a drug's effects can play a significant role in supporting drug-taking behavior.

Dependence is a type of neuroadaptation to drug exposure. With prolonged use of a drug, cells in the brain adapt to its presence such that the drug is required to maintain normal cell function. On abrupt withdrawal of the drug, the cell behaves abnormally and a withdrawal syndrome ensues. Generally, the withdrawal syndrome is characterized by a series of signs and symptoms that are opposite to those of the drug's acute effects. For example, withdrawal of sedative drugs produce excitation and irritability. Conversely, withdrawal of stimulants produces profound depression.

The magnitude of the withdrawal syndrome varies from drug to drug. Although the severity varies, withdrawal is associated with the cessation of use of most drugs of abuse. Opiates, cocaine, amphetamines, barbiturates, alcohol, and benzodiazepines produce pronounced and sometimes severe withdrawal symptoms (20,24,56,68,74) while those for nicotine and caffeine are less intense (1,3 1). A mild withdrawal episode is associated with discontinued cannabis use, while none is associated with lysergic acid diethylamide (LSD) use (12,63). No matter the severity of the physical withdrawal syndrome, its existence can create a craving or desire for the drug and dependence can play a very strong role in recurrent patterns of relapse and maintaining drug-seeking behavior to forestall withdrawal.

At one time, withdrawal was believed to peak within several hours after drug-taking was discontinued and then dissipate; similarly, common knowledge held that tolerance to most drugs was thought to dissipate gradually with time, as the brain readapted to the drug's disappearance. Substantial evidence now indicates that persistent, residual neuroadaptations are present, which can last for months or possibly years, and mayor may not be associated with the pathways that mediate physical dependence (33,44,45,77). An important component of this phenomena maybe the learning which takes place during drug-taking behavior. Moreover, with repeated cycles of abstinence and reinitiation of drug use, the time required to elicit drug dependence grows shorter and shorter. Evidence also indicates that the administration of naloxone, a drug that blocks the actions of opiates, may elicit a withdrawal syndrome in individuals who have abstained from use for extended periods of time. These data indicate the existence of long--lasting, drug-induced neuroadaptive changes that

BOX 3-4: The Two Types of Tolerance

The two types of tolerance are: dispositional (pharmacokinetic) and pharmacodynamic. Dispositional tolerance develops when the amount of drug reaching active sites in the brain is reduced in some way Generally, this arises from an Increased breakdown of the drug or a change in its distribution in the rest of the body Thus, more drug must be taken to achieve the same blood levels or concentrations at the active sites in the brain.

Pharmacodynamic tolerance represents a reduced response of the brain to the same level of drug It develops during the continued and sustained presence of the drug. It may be that the mechanism of adaptation may differ from drug to drug and depend on the original mechanism of action of a given drug. The net effect is that more drug is required to overcome this new neuronal adaptation to produce an equivalent pharmacologic effect.

Although dispositional tolerance represents a component of tolerance to some drugs (e g., alcohol, barbiturates), in most cases much or all of the tolerance which develops to drugs with significant abuse potential can be attributed to pharmacodynamic tolerance, Tolerance can contribute to drug-taking behavior by requiring that an Individual take larger and larger doses of a drug to achieve a desired effect.

SOURCES Jaffe, J.H "Drug Addiction and Drug Abuse, " The Pharmacological Basis of Therapeutics, A G Gilman, TW Rail, A S Nies, and P Taylor (eds), (New York Pergammon Press, 1990) Kalant, H , "The Nature of Addiction An Analysis of the Problem, " Molecular and Cellular Aspects of the Drug Addictions, A Goldstein, (cd) , (New York, NY Springer Verlag, 1989)

persist for as yet undefined periods of time. Although information explaining this effect is lacking, these changes may help account for the relapses that sometimes occur in long-term abstinent, drug-dependent individuals.

Abuse Liability

The Comprehensive Drug Abuse Prevention and Control Act (Public Law 91-5 13) and the Psychotropic Substances Act of 1978 (Public Law 95-633) gives exclusive authority to the Secretary of the Department of Health and Human Services to determine the abuse liability of substances and to make recommendations concerning substance regulation and other drug policy decisions. Although the Secretary receives advice from the Drug Enforcement Administration (DEA), the Food and Drug Administration (FDA), and various other regulatory agencies, these laws explicitly state that the National Institute on Drug Abuse (NIDA) must provide to the Secretary information relevant to the abuse potential of suspected drugs of abuse and all facts key to an assessment of their abuse potential. On the basis of this information from NIDA, and input from FDA and DEA, the Secretary makes a judgment as to the dependence potential of new drugs. NIDA supports a variety of activities in commercial and private laboratories around the country to provide this information.

A drug's abuse liability is measured by the likelihood that its use will result in drug addiction. Many factors ultimately play a role in an individual drug-taking behavior; nevertheless, the abuse potential of a drug is related to its intrinsic rewarding properties and/or the presumed neuroadaptive motivational effects that result from its prolonged use. Drugs can be tested and screened for their abuse liability in animals. Four criteria can be evaluated to classify a drug as having significant abuse potential:

- pharmacological equivalence to known drugs of abuse,
- demonstration of reinforcing effects,
- tolerance, and
- physical dependence.

The capacity to produce reinforcing effects is essential to any drug with significant abuse potential, whereas tolerance and physical dependence often occur but are not absolutely required to make such a determination.

Testing new pharmaceuticals for their abuse potential is an important step in new drug development. Many major pharmaceutical firms today emphasize the development of new and safer drugs for pain reduction and in the development of psychoactive compounds for treatment of brain disorders. In particular, scientific strides in understanding the brain, neurological disease, psychiatric disturbances, and aging are fueling research into treatment of brain disorders. As psychoactive compounds become available, they must be screened for abuse potential. The abuse liability assessment of new products is not simply at the discretions of the manufacturer. Various federal regulatory laws mandate such testing and federal regulatory agencies are charged with seeing that testing is carried out. The College on Problems of Drug Dependence (CPDD), and, specifically, its Drug Evaluation Committee (DEC), provides the majority of abuse liability testing information to NIDA.

Animal models are generally used to screen for the abuse potential of new drugs in earlier stages of drug development or to evaluate abuse potential in drugs that cannot be readily studied in humans (2). Laboratory methods for abuse potential evaluation in humans are also well developed and is an area of active research (21). However, factors such as the heterogeneity of drug-using populations, the use of multiple drugs, and the other biological, social, and environmental factors involved in human drug use make human studies complex.

In terms of the validity of animal models as a means of studying human drug addiction, an excellent correlation exists between predicting the abuse liability of specific classes of drugs in animals and humans (34). However, it is recognized that animal models are imperfect and, in fact, there are examples of drugs that proved to have significant abuse potential in humans, whereas the preclinical testing in animals revealed relatively minimal abuse potential (9,33,38). The ultimate answer to the issue of whether a drug has significant abuse potential is long-term experience with the drug once it has become available, either legally or illegally. Nevertheless, animal models serve as the only practical means of initially screening drugs for abuse liability and have proven to be the most effective means of detecting whether there is likely to be a problem in humans.

Self-Administration

The predominant feature of all drugs with significant addiction-producing properties is that they are self-administered. In fact, self-administration of a drug to the point when the behavior becomes detrimental to the individual is the primary criterion for classifying a drug as having significant abuse potential for addiction. In addition to self-administration, another contributing factor to abuse liability is the notion of craving (9.33,38). Although craving is a difficult term to quantify, once a drug is voluntarily or involuntarily withdrawn, the increased desire to take the drug can play a role in the relapse to substance abuse. As previously mentioned, the reinforcing properties of the drug may shift the pattern of administration established during the initial, early phase of drug addiction. Specifically, the drug may have initial] y been self-administered for its pleasurable effects but may eventually be self-administered to relieve the discomfort associated with withdrawal.

Animals can be readily trained to self-administer drugs in a variety of settings (9). Animal models of self-administration provide a powerful tool that can give a good indication of the abuse liability of new or unknown drugs. These models also permit examination of the behavioral, physiological, and biological factors leading to sustained self-administration.

Drug Discrimination

Another tool in the assessment of abuse liability of drugs is drug discrimination, which refers to the perception of the effects of drugs (3,9). Specifically, animals or humans trained to discriminate a drug from a placebo show a remarkable ability

to discriminate it from other drugs with different properties. These procedures also permit a determination of whether the subject considers the drug to be the pharmacological equivalent of another drug. Pharmacological equivalence refers to the fact that drugs of particular classes, such as opiates, stimulants, and depressants cause a series of affects on the brain and other organs which collectively constitute their pharmacological profile. Drug discrimination provides a useful measure in animals to assess the subjective effects of drugs in humans.

Dependence and Tolerance

Physical dependence and tolerance to drugs of abuse can readily be induced in animals by chronic administration of these drugs (37,38). Following abrupt cessation of these drugs, a withdrawal syndrome will often develop and, if given the opportunity, self-administration rates will be increased. Furthermore, since the understanding of the biological changes which take place during the development of physical dependence and tolerance are poorly understood in humans, with the possible exception of opiate dependency (45), animal models offer a unique opportunity to carry out experiments designed to address these issues.

GENETIC FACTORS

Why does one person abuse or become dependent on drugs while another, exposed to a similar environment and experiences, does not? To date, the majority of biomedical research has focused on the role, if any, that genetics plays in individual susceptibility to substance abuse and dependence. There is growing interest, however, in researching other factors that effect a person's biological status. For example, nutrition, biological development, in utero experiences, early exposure to environmental lead, head injuries, and other environmental components, can modify individual neurophysiology. Thus, while this section features genetics, there are many other factors that can influence individual biological susceptibility to the effects of a drug.

Progress in understanding the genetics of various conditions and diseases has brought with it a realization that substance abuse and addiction probably involve a genetic component. That is, hereditary biological differences among individuals may make some more or less susceptible to drug dependency than others. However, a genetic component alone is undoubtedly insufficient to precipitate substance abuse and addiction. Unlike disorders such as Huntington's disease and cystic fibrosis that result from the presence of alterations in a single gene, any genetic component of substance abuse is likely to involve multiple genes that control various aspects of the biological response to drugs, individual temperament, and the propensity to engage in risk-taking behaviors, or physiological predisposition to become an abuser. In addition, the involvement of many behavioral and environmental factors indicates that any genetic component acts in consort with other nongenetic risk factors to contribute to the development of substance abuse and addiction. Thus, the presence or absence of a genetic factor neither ensures drug addiction nor precludes it.

Two questions arise when considering a genetic component to substance abuse and addiction. Do inherited factors exist? If so, what are they? To date, most of the work done in this field is related to alcoholism; much less is known about the genetics of other drugs of abuse.

Do Inherited Factors Exist?

Results from family, twin, and adoption studies as well as extensive research on animal models indicate that there are heritable influences on patterns of alcohol use. Animal studies using selective breeding techniques have established that alcohol preference, the reinforcing actions of alcohol, alcohol tolerance, and alcohol physical dependence can be affected by genetic factors. Although fewer studies have examined the genetic component of vulnerability to the addictive properties of other drugs of abuse, evidence from animal studies confirms the role of a genetic influence on the use and abuse of drugs other than alcohol. To study non-

alcoholic drug abuse in humans has been difficult because of substantially lower population prevalence and marked changes in availability and, hence, exposure to these substances. Investigation in this area is further hampered by the complexity of subjects' drug use—most drug abusers have used (and had problems from using) multiple substances. This has led researchers either to concentrate on one class of drug or to treat all illicit drug use as equivalent. The tendency to lump all illicit drugs into one category makes results difficult to interpret or compare.

Family Studies: Alcoholism

References to a familial tendency or hereditary "taint" of alcoholism date back to classical times (23). Family studies have repeatedly confirmed that the risk of alcoholism is higher among first-degree relatives (i.e., parents, siblings, children) of alcoholics as compared with the general population (54). Moreover, while family studies can establish that a disorder (or liability to a disorder) is transmitted, in general they fail to distinguish between biological and environmental transmission. This issue, however, can be evaluated in large family studies by analyzing multiple classes of relatives with differing degrees of genetic relatedness.

Results of numerous family studies indicate that alcoholism segregates within families, with male first-degree relatives of alcoholics having a higher incidence (ranging from 27 to 54 percent) than female first-degree relatives (6 to 17 percent) as compared to first-degree relatives of nonalcoholics (20 percent of males, 4 percent of females) (26,66,76). In fitting models of inheritance to family data, researchers concluded that observed patterns of inheritance were consistent with the hypothesis that familial factors predisposing to alcoholism were the same in men and women, but that nonfamilial environmental factors exerted more influence in the development of alcoholism in women (14). However, a review of drug abuse research on women presented several comparative studies of men and women showing that alcoholism among some women appeared more highly correlated with a family history of alcohol problems. Compared to alcoholic men in various studies, alcoholic women had a greater likelihood of having an alcoholic father and/or parents, as well as alcoholic siblings (47). Additionally, while perhaps not genetically influenced, familial alcoholics (those with at least one relative with alcoholism) appear to have earlier onset, more antisocial symptoms, more social complications of alcohol use, and worse treatment outcome than nonfamilial alcoholics (22,62,70).

Familial is not identical to genetic, and in the case of alcoholism, the familial patterns of inheritance are not consistent with those of a purely genetic condition (36,79). In addition, researchers suggest that the transmissibility of alcoholism has increased over time (65). Thus, any genetic factors promoting the development of alcoholism are significantly moderated by nongenetic influences.

Family Studies: Other Drugs

Although fewer family studies have been conducted on the genetic transmission of liability to other drugs of abuse, researchers suggest that, as in the case of alcohol, addiction to other psychoactive substances appears to run in families.

One study found evidence of drug use running in families, based on family history obtained from individuals admitted for substance abuse treatment (53). However, this study combined use of all illicit drugs into one category and relied on self-reports by the subject on his or her drug use as well as that of family members. A large family interview of opiate addicts found that the relatives of opiate users had elevated rates of drug addiction as compared with the controls (67). In addition, an association was found between opiate use and the presence of antisocial personality disorder (ASPD). Further analysis of these data revealed that the incidence of both drug abuse and ASPD was higher among the siblings of the opiate subjects than among their parents (49,50).

A familial association between opiate addiction and alcoholism has been noted in some studies (46). However, another family history study found that while both opiate addiction and alco-

holism clustered within families, co-occurrence of the disorders within families occurred only as frequently as expected by chance, thus supporting the hypothesis of independent transmission (29).

Little has been done to test hypotheses regarding familial transmission of liability to addiction to specific substances other than opiates or alcohol. One study examining treated drug abusers and their relatives found that alcoholism was equally common among relatives of individuals who preferentially abused opiates, cocaine, or sedative-hypnotics (27 percent, 31 percent, and 24 percent of male relatives, respectively), whereas relatives of sedative-hypnotic users were subject to diagnoses of other substance abuses (2 percent of male relatives, versus 11 percent of male relatives of opiate abusers and 16 percent of male relatives of cocaine abusers) (55).

Twin and Adoption Studies

Twin and adoption studies provide information to distinguish between biological and cultural transmission. Twin studies observe siblings raised in the same environment, but compare how often identical twins, who are genetically identical, and fraternal twins, who have the genetic similarity of nontwin siblings are concordant for a trait. A high concordance rate for a trait among identical twins versus fraternal twins usually indicates a genetic component for the trait. Adoption studies, by contrast, compare the presence of a trait among biological versus adoptive family members or other control groups. In this way individuals sharing the same environment but having different genetic heritages, or vice versa, can be compared.

Evidence from **twin studies** suggests genetic influences on drinking patterns as well as alcohol-related problems. Results from twin studies demonstrate genetic influences on measures of alcohol consumption such as abstention, average alcohol intake, and heavy alcohol use (28,39,61). Twin studies also indicate an inherited risk for smoking (16).

When evaluating the development of alcoholism, twin studies have generally supported the existence of genetic influences over the disorder's development. One early study found a higher concordance rate for alcohol abuse between identical twins (54 percent) than in fraternal twins (28 percent) (35), while two other studies did not find such a relationship (25,61). A 1991 study examined male and female identical twin pairs, and male and female fraternal twin pairs, with one member of the pair meeting the criteria for alcohol abuse or dependence (64). Researchers found that identical male twins differed from fraternal male twins in the frequencies of both alcohol abuse and dependence as well as other substance abuse and/or dependence. On the other hand, female identical and fraternal twins were equally likel y to abuse alcohol and/or become dependent on other substances, but identical female twins were more likely to become alcohol dependent. Another study of 356 twin pairs also found higher identical than fraternal rates of concordance for problems related to alcohol and drug use as well as conduct disorder (52). The same study also noted that among men, heritability played a greater role in the early rather than late onset of alcohol problems, whereas no such effect was seen among women. However, a study of 1,030 female twin pairs found evidence for substantial heritability of liability to alcoholism, ranging from 50 to 60 percent (40).

Thus, twin studies provide general agreement that genetic factors influence certain aspects of drinking. Most twin studies also show genetic influence over pathological drinking, including the diagnosis of alcoholism, which appears (like many other psychiatric disorders) to be moderately heritable. Whether genetic factors operate comparably in men and women, and whether severity of alcoholism influences twin concordance is less clear. How psychiatric comorbidity may affect heritability of alcoholism also remains to be clarified.

Adoption studies have supported the role of heritable factors in risk for alcoholism (6,1 1,71). The results from a series of studies conducted in Denmark during the 1970s are typical. Researchers studied male adoptees, later comparing them with nonadopted brothers; female adoptees, later

comparing them with nonadopted daughters of alcoholics, comparisons were also made with matched control adoptees. Sons of alcoholic and nonalcoholic parents who were put up for adoption were compared for the development of alcoholism. Sons of alcoholic parents were found to be four times as likely as sons of nonalcoholic parents to have developed alcoholism; evidence also suggested that the alcoholism in these cases was more severe. The groups differed little on other variables, including prevalence of other psychiatric illness or "heavy drinking." Being raised by an alcoholic biological parent did not further increase the likelihood of developing alcoholism; that is, rates of alcoholism did not differ between the adopted-away children and their nonadopted brothers. In contrast, a study of daughters of alcoholics revealed no elevated risk of alcoholism (23).

Another analysis examined factors promoting drug abuse as well as alcoholism (10). In this study, all classes of illicit drug use were categorized into a single category of drug abuse. Most of the 40 adopted drug abusers examined had coexisting ASPD and alcoholism; the presence of ASPD correlated highly with drug abuse. Among those without ASPD, a biological background of alcoholism (i.e., alcoholism in a biological parent) was associated with drug abuse. Also, turmoil in the adoptive family (divorce or psychiatric disturbance) was associated with increased odds for drug abuse in the adoptee.

Finally, results from other adoption studies suggest two forms of alcohol abuse (7,13). The two forms were originally classified by C.R. Cloninger as "milieu-limited" or type 1 alcohol abuse and "male-limited" or type 2 alcohol abuse (15). Type 1 alcohol abuse is characterized by moderate alcohol problems and minimal criminal behavior in the parents, and is generally mild, but occasionally severe, depending on presence of a provocative environment. Type 2 is associated with severe alcohol abuse and criminality in the biological fathers. In the adoptees, it is associated with recurrent problems and appears to be unaffected by postnatal environment.

While the appropriateness of the biological and environmental parameters used in the Cloninger study have been challenged, the discriminating characteristics used to classify individuals as type 1 or 2 alcohol abusers have not been-until recently. A new study of familial and nonfamilial male alcoholics has investigated the type 1 and 2 classifications by analyzing the importance of age differences and cohort distributions (19). The researchers showed that among the male alcoholics, there was not a clear distinction between familial and nonfamilial based alcohol abuse problems and type 1 or 2 characteristics, as reported in previous studies. Additionally, another recent publication discusses the absence of paternal sociopathy in the etiology of severe alcoholism, and the possibility of a type 3 alcoholism (30). This type of research raises obvious questions as to the validity of the discriminating characteristics originally outlined by Cloninger and currently used in the classification of individual alcohol abusers.

In summary, adoption studies of alcoholism clearly indicate the role of biological, presumably genetic, factors in the genesis of alcoholism. They do not exclude, however, a possible role for nongenetic, environmental factors as well. Moreover, researchers have suggested more than one kind of biological background may be conducive to alcoholism. In particular, one pattern of inheritance suggests a relationship between parental antisocial behavior and alcoholism in the next generation. Thus, adoption studies, like other designs, suggest that even at the genetic level, alcoholism is not a homogeneous construct.

What Is Inherited?

While study results indicate a probable genetic component to alcoholism and probably other drug abuse, they lack information about what exactly is inherited. For example, do individuals with a family history of drug abuse have an increased susceptibility or sensitivity to the effects of drugs with reinforcing properties? If a susceptibility exists, what are its underlying biological mechanisms? To understand what might be inherited, both indi-

viduals who have a substance abuse problem and animals models of substance abuse are studied. Various types of information can be derived from these studies. As with family, twin, and adoption studies, much more information is available about alcoholism as compared with other drugs of abuse.

First, it maybe possible to identify specific inherited risk markers for alcoholism and other substance abuse. A risk marker is a biological traitor characteristic associated with a given condition. Thus, if an individual is found to have an identified marker for substance abuse, he or she is at risk for developing a drug dependency. To date, no biological characteristic has been clearly identified as being a risk marker for either alcoholism or substance abuse, although evidence suggests some possible candidates. The identification of a valid and reliable risk marker could provide important information about the fundamental mechanisms underlying substance abuse and addiction and would be an invaluable aid in diagnosis and treatment.

Second, inherited differences in biochemical, physiological, and anatomical processes related to differences in drug responses might be identified and studied. Animal models of substance abuse allow thorough biological assays to be carried out. Animal genetic models of substance abuse consist of strains of animals (usually rodents) that have been selectively bred to either exhibit a preference for taking or refusing a drug, or to differ in some way in their behavioral or physiological response to a drug. In the case of alcohol, studies suggest that low doses of alcohol are more stimulating and produce a stronger positive reward in rats bred to have a high preference for alcohol as compared with normal rats. Experimental data indicate that this may be due to inherited differences in the dopamine, GABA, and serotonin systems (27,32, 57,73). These differences represent inherited traits related to drug taking behavior, and these animals can be examined to determine what biological mechanisms are involved in the expression of these traits.

Third, the genetic technique of linkage analysis can narrow the area on a chromosome where a gene may be located. It can lead to the identification of the gene itself which in turn can improve the understanding of the molecular events that underlie the expression of the gene. There have been few genetic linkage studies related to substance abuse since few specific biological traits associated with drug dependency have been identified. Some studies in humans have been carried out related to alcoholism but the findings of these studies are contradictory and inconclusive.

Several studies have reported an association between alcoholism and a gene that regulates the number of a type of dopamine receptor in the brain; other studies have found no such link (4,5,8,18,58). The reason for this discrepancy is unclear. One study revealed a relationship between the presence of the gene not only in alcoholics, but in other disorders such as autism, attention deficit hyperactivity disorder, and Tourette's syndrome (17). Thus, the presence of this particular gene, while not uniquely specific for alcoholism, may cause an alteration in the brain's dopamine system that somehow exacerbates or contributes to alcohol abuse.

Few studies have examined possible inherited biological mechanisms associated with the abuse of other drugs. For example, strains of rats and mice that differ in their sensitivity to the reinforcing effects of cocaine and in their cocaine-seeking behavior have been observed to also have differences in the actual number of dopamine-containing neurons and receptors in certain brain areas. Also, a comparison of one strain of rat that self-administers drugs of abuse at higher rates than another strain, found that the higher self-administering strain exhibited differences in the intracellular mechanisms that control activity in some of the neurons in the brain reward system (see box 3-2) as compared with the low self-administering strain. Additional studies exploring the role of genes in drug response are needed to more fully understand the full range of biological factors associated with drug abuse. The recent develop-

ment of new and more sensitive techniques to analyze brain activity and processes will facilitate these studies.

ROLE OF LEARNING

The learning that occurs during drug-taking activities is an important force in the continued use and craving of drugs (59,72). Drugs of abuse often produce feelings of intense pleasure in the user. In addition, such drugs produce changes in numerous organ systems (e.g., cardiovascular, digestive, endocrine). Both the behavioral and physiological effects of a drug occur in the context of the individual's drug-seeking and drug-using environment. As a result, environmental cues are present before and during an individual drug use that are consistently associated with a drug's behavioral and physiological effects. With repetition the cues become conditioned stimuli, that on presentation, even in the absence of the drug, evoke automatic changes in organ systems and sensations that the individual reports as drug craving. This is analogous to Pavlov's classical conditioning experiments in which dogs salivated at the cue of a bell following repeated pairing of food presentation with a ringing bell. Evidence for this effect is seen in numerous studies showing that animals seek out places associated with reinforcing drugs and that the physiological effects of drugs can be classically conditioned in both animals and humans (72).

Conditioning also occurs in relation to the withdrawal effects of drugs (75). It was observed that opiate addicts who were drug free for months and thus should not have had any signs of opiate withdrawal, developed withdrawal symptoms (e.g., yawning, sniffling, tearing of the eyes) when talking about drugs in group therapy sessions. This phenomenon, termed conditioned withdrawal, results from environmental stimuli acquiring the ability, through classical conditioning, to elicit signs and symptoms of pharmacological withdrawal. Conditioned withdrawal can also play a role in relapse to drug use in abstinent individuals. The emergence of withdrawal symptoms as a result of exposure to conditioned cues can motivate an individual to seek out and use drugs.

These associations are difficult to reverse. In theory, repeated presentation of the environmental cues, without the drug should extinguish the conditioned association. Animal studies indicate that stopping the conditioned response is difficult to achieve and does not erase the original learning. These types of studies examining drug conditioning have found that various aspects of extinguished responses can either be reinstated with a single pairing of the drug and environmental cue, can be reinstated with a single dose of drug in the absence of the environmental cue, or can spontaneously recover (72).

Thus, exposure to environmental cues associated with drug use in the past can act as a stimulus for voluntary drug-seeking behavior. If the individual succeeds in finding and taking the drug, the chain of behaviors is further reinforced by the drug-induced, rewarding feelings and the effects of the drug on other organ systems (59). The effects of the environmental stimuli can be similar to the priming effects of a dose of the drug.

The complexity of human responses to drugs of abuse, coupled with the number of drugs that are abused, complicates understanding of the role of biology in drug use and abuse. Nevertheless, scientists know the site of action of many drugs in the brain, and sophisticated new devices are expected to improve that understanding. A genetic component to drug use and abuse is likely, but it has not been fully characterized.

SUMMARY

Underlying all alcohol and drug problems are the actions and effects that drugs of abuse exert. It is important to understand how drugs work in the brain, why certain drugs have the potential for being abused, and what, if any, biological differences exist among individuals in their susceptibility to abuse drugs.

Two biological factors contribute to substance abuse and addiction: the effects drugs of abuse exert on the individual, and the biological status of

the individual taking drugs. The effects the drugs exert can be either acute or chronic and will vary depending on the drug and its route of administration. Most drugs of abuse influence the brain's reward system. The pleasurable sensations that drug use can produce reinforce drug-seeking and -taking behaviors. These actions differ with different drugs: and, thus, some substances have greater potential for abuse and addiction than others.

Prolonged or chronic use of a substance or substances can produce both biological and behavioral changes (some long-lasting). Biological changes can include sensitization and/or tolerance and, if use is discontinued, withdrawal. The behavioral changes from continued drug use are directly related to these biological changes. An individual's drug-craving, -seeking, and -taking behaviors are amplified through the neuroadaptive changes in the brain reward system that occur with chronic administration.

Environmental cues also play a large role in drug-seeking and -taking behavior. On encountering certain environmental stimuli (i.e., specific locations, smells, tastes), drug-craving and drug withdrawal symptoms have been reported by former drug users who have been drug-free for months, even years.

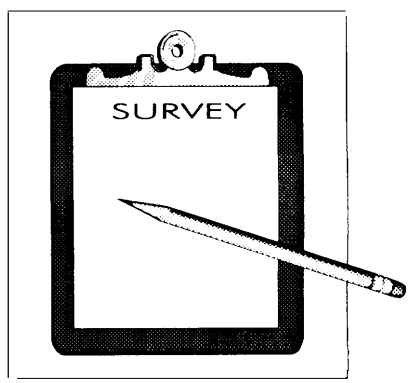
Through family, twin, and adoption studies, most researchers agree that genetic factors play some part in the heritability of alcohol problems and, although less clear, other drug problems. No conclusive evidence has been found to explain precisely what is inherited or the overall importance of this inherited material. It has been hypothesized that there are probably numerous genes (as opposed to one) that interact in complex ways, and whose expressions are affected by a myriad of environmental factors. Thus, the presence or absence of a genetic factor neither ensures nor protects against drug dependency.

Availability 4

Availability is a precondition for drug abuse and dependency. A person cannot become a drug abuser unless a drug is available to be used.

Drug availability is often thought of as mere physical presence of an abusable substance. In addition, however, availability is affected by social norms (social availability), prices (economic availability), and personal values (subjective availability y) (see table 4-1). Marketing techniques for both licit and illicit drugs can alter social, economic, and subjective availability, and thus are addressed in this chapter (see box 4-1).

A substantial body of literature addressing the relationship between drug availability and drug demand does exist. However, most of this information addresses tobacco and alcohol, rather than illicit drugs. In addition to conducting a literature search (primarily of mass media), the Office of Technology Assessment (OTA) contracted with the National Center for Juvenile Justice (NCJJ) to conduct a survey of juvenile probation officers on the perceived availability of drugs and to conduct a workshop on availability issues (see appendix F for a list of participants).



AVAILABILITY

Availability is a concept usually reserved for the supply-side of the substance abuse policy equation (i.e., making drugs available to supply an already existing demand). However, the proximity of drugs and drug dealers to potential users, and the ease with which these substances can be purchased or otherwise obtained can affect demand, use, and abuse. This is especially true when one considers aggressive marketing efforts by suppliers, who seek to create or expand the demand for drugs by convincing potential

TABLE 4-1: Four Categories of Availability

Category	Primary question
Physical availability	Is a substance physically available?
Economic availability	Is the substance affordable?
Subjective availability	Is the substance available in a manner I would choose to use?
Social availability	Is the substance available in my social setting?

SOURCE Off Ice of Technology Assessment, 1994

consumers of the benefits, acceptability, and availability of these substances. While availability is a concept that applies to the whole range of drugs, most of what we know about its role in drug use and abuse comes from research in the arena of alcohol and tobacco abuse (1 ,9,10, 14) (see box 4-2 and figure 4-1).

Research has shown that when alcohol is more available, the prevalence of drinking, the amount of alcohol consumed, and the heavy use of alcohol all increase (5). Alternatively, the literature also suggests that physical conditions that restrict alcohol availability reduce rates of alcohol consumption (1). A review of alcohol-related literature reveals that availability y can be conceptualized in four different, yet related categories.

Physical Availability

Physical availability refers to a basic element—the proximity and accessibility of an abusable substance. Simple logic dictates that if a substance is absent, it cannot be used. Government interdiction and law enforcement policies target the physical availability of illicit drugs. Other policies, such as limitations on the point-of-sale, hours, or age of purchasers, target the physical availability of other abusable drugs, such as tobacco and alcohol products.

Responses to the OTA survey of juvenile probation administrators indicated that respondents perceived two ways in which physical availability is increased: through contamination by outsiders (e.g., youth gangs, tourists, foreigners) bringing drugs into the community, and through proximity to a source of drugs or alcohol.

Gangs and organized drug trafficking were mentioned often by respondents as reasons for increases in the availability of drugs. Respondents from all over the country, representing both rural and urban areas, registered concerns about gangs and their role in marketing and trafficking drugs. A respondent from Canton, Mississippi, for example, attributed the increase in drug availability simply to “gang leaders from California.” A respondent from Waterbury, Connecticut, was more explicit about the age and ethnicity of the gang influences, attributing the observed increase in drugs to the “emergence of gang activity for the 12-to-1 5-year-old age group, particularly in the Hispanic and black ethnic groupings.” A respondent from Paducah, Kentucky, said that the “increase in drugs has been from gangs entering the community from Memphis, Tennessee, Arkansas,

BOX 4-1: What Is Marketing?

Marketing includes any activity involved in moving goods from producer to consumer In the context of drugs, marketing includes a variety of activities covering a wide range of licit and illicit substances

For licit substances, such as alcohol, tobacco, and inhalants, it includes market research, advertising, pricing, and taxation A number of government policies in the marketing arena—taxes, advertising restrictions, point-of-sale controls, and age restrictions on certain products—directly affects the availability of licit, yet abusable, substances

For illicit drugs, such as marijuana, cocaine, and hallucinogens, marketing techniques can include street markets, gang activity, and private, closely controlled distribution and sales systems Government control in this area—prohibiting the possession, use, and sale of such substances—likewise affects the availability of these substances.

SOURCE Off Ice of Technology Assessment, 1994

BOX 4-2: Availability and Tobacco

The evolution of tobacco from a relatively rare product requiring preparation, thought, and ritual to a product that IS ubiquitous, prepackaged, and consumed without much fanfare provides a graphic illustration of how Increased physical availability of a product can dramatically increase drug use, abuse, and addiction Three major developments in the history of tobacco use paved the way for making this drug imminently available for use by consumers the invention of the cigarette manufacturing machine, the invention and perfection of matches, and the proliferation of the use of vending machines to sell tobacco products

The first successful cigarette manufacturing machine was developed in 1881 by James A Bonsack This machine had the capacity to produce more than 200 cigarettes per minute Prior to the advent of this machine, smokers had to roll each cigarette by hand, a time-consuming and often ritualistic process

Once rolled, a cigarette must be lit to be consumed This was no easy task prior to the Introduction of the safety match, first invented in 1896 but not perfected until 1912 Without matches, smokers were required to enter cigar stores to light cigarettes from gas or oil lamps provided specifically for the purpose of lighting tobacco products These developments changed forever the way that cigarettes were consumed by making them readily available for consumption at any moment during the day Instead of a thoughtful, often ritualistic exercise, cigarette consumption has evolved for some into an almost unconscious habit Following the invention of the manufacturing machine and the safety match, the rate of cigarette consumption soared during the late 19th and early 20th century

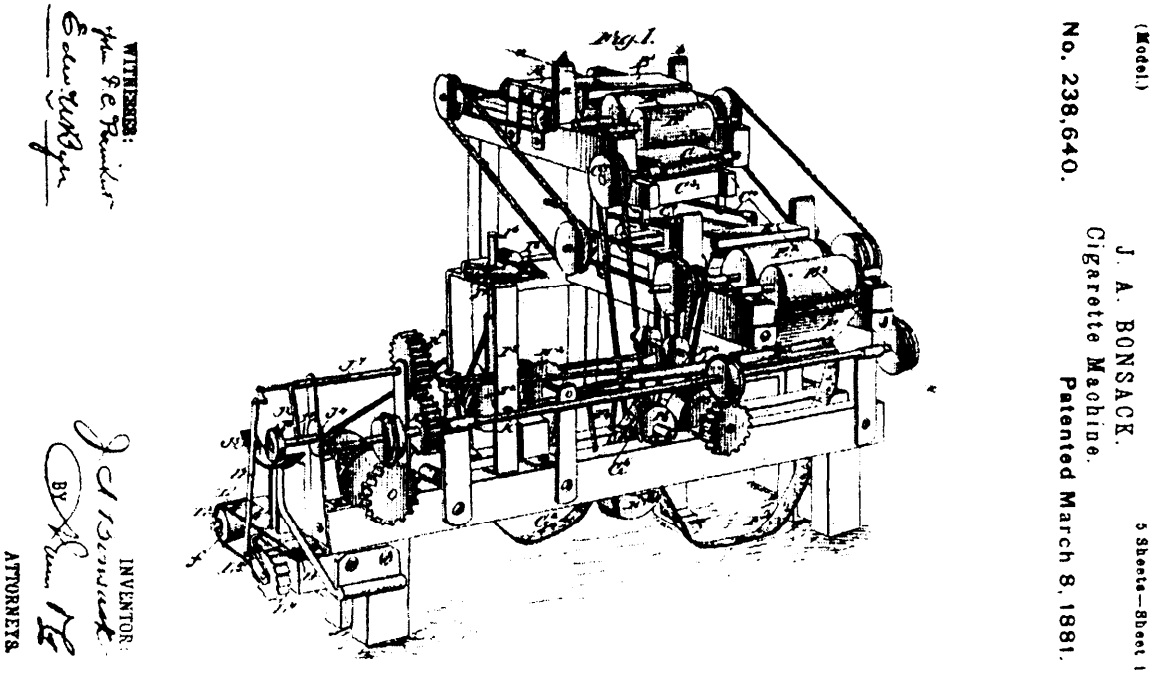
The use of vending machines may be the most revolutionary aspect of tobacco availability First Introduced in 1926, vending machines require no sales person, are not restricted by selected hours of operation, and are not concerned with the age or legality of the purchaser Vending machines make cigarettes available almost anywhere, appearing in bars, hotels, train and bus stations, airports, hotels, and restaurants By 1953, nearly half a million cigarette machines existed and were responsible for sales of more than 3 billion packs of cigarettes a year The upward trend in sales from cigarette machines continued through the mid-1 970s by 1973 more than 900,000 vending machines were in operation, selling almost 5 billion packs per year Some early research indicated that the existence of vending machines throughout the physical environment is a major inducement to impulse smoking

SOURCE Office of Technology Assessment, 1994, based on J Mosher, "The Environmental Approach to Prevention, " The California Prevention Network Journal 3, 42-44 (1 990), R Tenant, The American Cigarette Industry A Study in Economic Analysis and Public Policy (New Haven CT Yale University Press, 1950), R Sobel, They Sat@ The Cigarette in American life (Garden City, NJ Anchor Press/Doubleday, 1978), Marshall, M V, Automatic Merchandising, A Study of the Problems and Limitations of Vending (Cambridge, MA The Riverside Press, 1954)

and Chicago, Illinois." The respondent from Davenport, Iowa, attributed the increase to attempts by "Chicago gang members to establish crack markets in Quad Cities—lots of arrests of Chicago residents including juveniles. " Even cities with an established history of youth gangs identified gangs as being responsible for increases in drugs. For example, a respondent from Philadelphia, Pennsylvania, attributed the observed increase to the fact that ● 'gang participation has become increasingly sophisticated. "

However, gangs were not the only phenomena associated with increasing the physical availability of drugs and alcohol. Many respondents were concerned with the potential for contamination due to proximity to areas thought to be established drug markets or through proximity to the means for widespread drug distribution (e.g., major highways and roads, prisons).

Physical availability is necessary but not solely responsible for drug use. For example, drugs often are physically available but are not always used.



The cigarette rolling machine was patented in 1881 by James Albert BonSack, a Lynchburg, Virginia, teenager

Also, seeking to prevent or reduce drug use solely by eliminating or reducing physical availability may be doomed to failure, since it has proven to be very difficult to keep drugs out of communities. So although the concept of physical availability is important, it is limited, both as a cause and a cure to drug use and abuse.

Economic Availability

Economic availability may be increased when a person has access to surplus income or the costs of drugs are low, illegal drug sales are a key component of the local economy, or the price per unit of a drug or drugs in general is reduced. In describing the difference between "private" and "flagrant" drug markets, one article specified some of the dimensions of the changing economics of addiction:

> If cigarettes were sold only by the carton and whiskey only by the case, the effect would be to decrease the total consumption of tobacco and whiskey. Presumably, few people would start smoking cigarettes if the first experimental purchase were a $20 carton rather than a $1 pack. Similarly, fewer poor people would drink if they were required to buy whiskey by the case. A similar effect would, in all likelihood, hold true if open air and flagrant drug markets were eliminated (3),

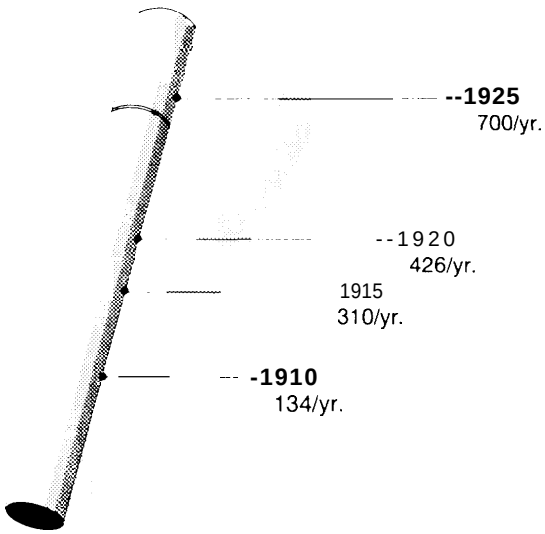
In addition to overall conditions, economic availability of all substances can be affected by the pricing of products. For licit products such as alcohol and tobacco, economic availability is also affected by taxes levied by federal, state, and local authorities.

In 1989, federal excise taxes on tobacco, alcoholic beverages, and motor fuels raised $24.4 billion in revenue—about 2.5 percent of total federal revenues (11). Excise taxes—taxes on specific products—while representing a small part of total taxes, are an important consideration in the economic availability of licit substances.

Excise taxes are seen by many as having three impacts:

- to raise revenue for government programs;
- to make certain harmful substances less affordable and, hence, less used and abused; and

FIGURE 4-1: Per Capita Cigarette Consumption, 1915-1925



Americans consumed.5 billion cigarettes in 1880, 2.2 billion in 1888, 18 billion in 1914, and 54 billion in 1919. The annual per-capita consumption of cigarettes reflected the total production figures

SOURCE R Sobel, They Satisfy *The Cigarette in American Life (New* York NY Anchor Press/Doubleday, 1978)

- to cover societal costs that accrue from the use of various subtances (e.g., environmental costs from the use of gasoline, health costs resulting from smoking and drinking).

Whether taxation of alcoholic beverages and tobacco products is an appropriate means of reducing societal costs caused by their use is a continuing public debate. Some argue that the public health costs and other external costs are so significant as to justify substantial excise taxes. Others counter that such taxes are regressive—impacting the poor more than the rich—and reduce the satisfaction experienced by millions of sensible drinkers without necessarily reducing the harm caused by excessive drinkers (8).

Social Availability

Social availability refers to those factors within the community conducive to drug use. One study explored alternative explanations for reported declines in cocaine use among high school seniors, using questionnaire data from annual nationwide surveys conducted from 1976 to 1988 (2). Results of this analysis indicated that although lifestyle factors showed strong links with the use of marijuana and cocaine, these factors had not developed trends in ways that could account for declines in the use of either drug. Reported physical availability of either drug had not been reduced. Instead, increases in perceived risks and disapproval appear to have contributed substantially to the recent declines in the use of marijuana and cocaine. The study concluded that it was important to lower demand by reducing social availability, as opposed to trying to reduce supply by reducing physical availability.

Increasingly, grass roots community action groups are working to diminish both the subjective and social domains of availability. These efforts usually entail developing and presenting public awareness and fact-based education to consumers and potential consumers, decreasing community tolerance for drug use while increasing collective pride in the community, and developing or otherwise demonstrating alternatives to substance use and abuse.

Subjective Availability

Subjective availability encompasses individual differences in how people perceive their access to substances. For example, an individual may choose to use one type of abusable substance, but not another. Or, an individual may choose to use a drug (e.g., cocaine), but only in certain forms (i.e., a person may choose to snort a line of cocaine but refuse to smoke or inject it). The person who refuses to use illicit drugs has interjected his or her personal values in a way to make illicit drugs unavailable, even if they are physically and economically available.

One reviewer identified four components of subjective availability as it relates to alcohol: 1) willingness to go out of one's way to purchase alcohol, 2) perceived convenience of buying alcohol, 3) discomfort about buying alcohol, and 4) importance of the price of alcohol. Subjective and social availability were demonstrated to have direct influences on alcohol consumption, and subjective and social aspects of availability can mediate and outweigh the influence of physical availability (1).

Subjective availability is likely to increase when an individual holds attitudes or values favorable toward use; lives in a community that condones, or even celebrates, drug use; and has ready access to drugs that are highly valued, particularly if those agents are addictive.

ARE DRUGS READILY AVAILABLE?

A number of surveys exists for measuring drug use (see chapter 2). In addressing the question of whether drugs are readily available, several measures exist (e.g., marketing figures related to alcohol and tobacco sales, tallies of illegal drugs seized by law enforcement authorities). In addition to quantitative measures of drug use, many people perceive various drugs to be widely available. In an attempt to measure these anecdotal perceptions, OTA surveyed juvenile probation administrators randomly selected from a database maintained by NCJJ.

The purpose of the survey was to identify communities that have experienced a sudden, observable change in the abuse of drugs or alcohol in the past 12 months and to collect preliminary data about the events and circumstances leading to the change in abuse. Such anecdotal evidence could be gathered from a number of groups; OTA chose to survey juvenile justice officials because of their involvement in drug issues and the availability of a nationwide database of such officials who could be accessed.

TABLE 4-2: Factors Affecting Physical Availability (by percentage)

Fa o	Yes	No
Influx of Illegal drug marketeers in the community.	64.0	36.0
Increase in gang activity.	63.7	36.3
Increase of illegal sales of alcoholic beverages to minors.	60.1	39.9
Establishment of new drug distribution routes.	53.8	46.2
Increased community tolerance of illegal drugs and illicit alcohol use.	41.9	58.1
Development or introduction of "new" or '(designer" drugs.	35.9	64.1
Establishment of businesses or other entities that attract wide diversity of youths (i.e., shopping mall, under 21 dance clubs, etc.)	33.2	668
Decreased law enforcement presence in the community,	26,6	734

SOURCE Off Ice of Technology Assessment, 1994

Responses were received from 246 juvenile justice administrators across 38 States. **The data provide a glimpse at some of the drug and alcohol availability issues being addressed by juvenile courts and probation departments across the United States. Seven findings resulted from the survey:**

- Most respondents consider substance abuse to be a serious problem in their communities. Using a scale of 1 (not serious) to 10 (very serious), the respondents, on average, rated the problem of substance abuse among juveniles in their communities at 7.4. In addition, 85.8 percent of the respondents rated substance abuse seriousness at six or above.
- Almost half of the respondents indicated a dramatic increase in availability of drugs and/oralcohol in their communities. A total of 46.7 percent of the survey respondents reported a dramatic increase in the availability of drugs and/or alcohol in their communities. Some 50.8 percent of the respondents indicated "no dramatic changes" in perceived availability of drugs and/or alcohol. Only 2.4 percent indicated a dramatic decrease in availability.

TABLE 4-3: Availability of Specified Substances (by percentage)

	Dramatic decrease	Decrease	No change	Increase	Dramatic increase	Don't know
Alcohol	0.4	2.1	42.0	44.4	9.9	1.2
Marijuana	1 6	4.9	50.2	34.2	7 4	1.6
Psychedelics	0.8	5.8	41,7	24.0	6.2	21.5
Amphetamines	2.0	6.7	56.7	15,4	2.1	17,1
Barbituates	0.8	8.3	61.4	4.6	0.4	24.5
Tranquilizers	0.8	6.2	59.3	8.3	0.4	249
Heroin	1.2	4.6	48,1	20.7	2.5	22,8
Cocaine	1,2	3.7	28,1	39.7	17.8	9.5
Cocaine (Crack)	0.8	2.5	27,4	35.3	24,5	9.5
Other Narcotics	09	1.8	51,3	10.1	2.2	33.7
Inhalants	08	4 2	46,3	23.8	14.6	10.3

SOURCE Off Ice of Technology Assessment, 1994

- Factors affecting physical availability (i.e., sales and/or distribution of drugs) were selected most often and were rated highest in terms of increasing availability y of drugs. Given an opportunity to select and rate commonly cited reasons for increased availability of drugs and alcohol, the respondents selected items that were strongly associated with the sales and distribution of drugs and alcohol (see table 4-2).
- Crack cocaine and cocaine were much more likely than other drugs to show dramatic increases in availability. Respondents were given an opportunity to report whether they had noticed a change (ranging from a dramatic decrease to a dramatic increase) in the availability of a range of drugs, including alcohol. Crack (24.5 percent) and cocaine (17.8 percent) had the highest percentage of respondents indicating a "dramatic increase" in availability. The next closest were inhalants at 14.6 percent (see table 4-3).
- Economic conditions and the perceived lack of real opportunities for many youths were frequently cited as factors contributing to the increased availability of drugs in many communities (see box 4-3).
- Survey respondents listed several factors contributing to a sense of social availability, including lack of parental/guardian supervision, consequences for alcohol and drug offenses, alternative activities, as well as portrayals of alcohol and drug use by the mass media as a glamorous and healthy activity (see box 4-4).
- 9 Substance abuse prevention and early intervention efforts were rated highest as important community responses to increases in the availability of drugs and alcohol. Over 80 percent of respondents agreed that an increase in prevention and intervention efforts was an important response to an increase in the availability of drugs. Trailing behind prevention and early intervention were increased law enforcement (68.4 percent), increased treatment (68.2 percent), and stiffer judicial penalties (68.0 percent). Respondents were also asked to rate the relative effectiveness of the listed responses to availability on a scale of 1 (not effective) to 10 (very effective). Prevention and early intervention (6.4 percent) was rated the highest in terms of perceived effectiveness, but not much higher than law enforcement (6.2 percent), increased treatment (6.0 percent), and stiffer judicial penalties (6.2 percent) (see table 4-4).

MARKETING

Standard marketing strategies used to increase consumption of legal goods are used in equally effective ways to increase consumption of illicit drugs. Marketing refers to efforts by individuals

BOX 4-3: Survey Comments, Economic Availability

Economic factors impact on perceptions of availability in a number of ways. For example, because Sioux Falls, South Dakota, was experiencing a "strong economy juveniles have had an abundance of cash available for alcohol/drug usage. " More frequent, however, were comments stating the opinion that a poor economy increased the economic availability of drugs and alcohol:

Frankfort, Kentucky: "Profit motive due to national economy and lack of job training/jobs Lack of hope and opportunity for some causes increased sale of drugs due to high profit. "

Barbourville, Kentucky: "Drug dealers that cannot make it flipping hamburgers, but are successful at selling drugs and have a lot of material evidence of their success. Law enforcement needs to confiscate these material items in prosecution of case. Also, involvement of drug dealing by law enforcement and politicians is a problem. "

Harrisburg, Pennsylvania: "Teenaged drug dealers have status, money, jewelry, cars, designer clothes, etc , which many of their peers cannot afford. "

Fort Worth, Texas. "Depressed economic conditions—Lack of legitimate means to obtain income It's easy money with minimal consequences for conviction. "

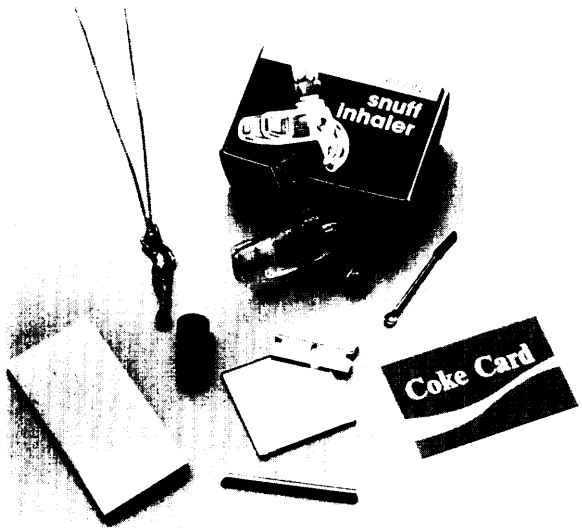
SOURCE Office of Technology Assessment, 1994

interested in the sale or trade of a product to maintain or increase sales by maintaining market shares and opening new markets. Marketing includes efforts to increase the perceived availability of a product or products by enhancing the sense of both subjective and social availability in prospective consumers. To the extent that those efforts are successful, then purveyors of consumer products will attempt to make the supply match the demand (physical availability) at a cost that maximizes both sales to consumers (economic availability) and profits to the sellers.

Illegal Drugs

Illegal drugs are marketed aggressively in the United States. Some of the strategies for marketing illicit drugs are very similar to those strategies for marketing licit products. Sometimes the distinction between licit and illicit products is difficult to determine. Take, for example, the case of so-called head shops. Drug paraphernalia are items sold specifically to promote the preparation, manufacture, or marketing of drugs. Head shops may sell a wide variety of products that are often associated with specific drugs, for example:

- Stash cases, rolling machines, pipes, bongs (marijuana).
- Bottles, concert kits, brass straws, spoons (cocaine).



PATRICIA M TICE

Head shop paraphernalia that some patrons might use in consuming crack cocaine. They include, clockwise from the top, a snuff inhaler, a plastic coke card, a gold plated set at center composed of a spoon, nasal straw, razor blade, and mirror. Users cut any large particles of cocaine on the mirror with the blade and shape the drug into thin lines before inhaling them. The gold plating prevents the acid in cocaine hydrochloride from rusting the equipment. Prefoldedpapers make neat and efficient packets for storing cocaine. The necklace at the top doubles as a cocaine spoon.

BOX 4-4: Survey Comments, Social Availability

Conway, New Hampshire. "Our law enforcers are known and make little inroads towards prosecuting drug traffickers or sellers. Many young adults supply liquor and drugs to underage kids in our area. "

Mount Holly, New Jersey "The legal system does not fairly prosecute offenders It gives some juveniles the message that depending upon your circumstances it is OK to use and sell drugs "

Muskogee, Oklahoma "The lack of prosecutive vigor in alcohol-related offenses (Minor in possession, public intoxication, D U I). District attorney does not vigorously pursue and law enforcement treats D U I as public intoxication "

Prineville, Oregon "This community is basically a blue collar community. There is an attitude of acceptance of juveniles using alcohol Kind of a boys will be boys attitude "

South Bend, Indiana "We have seen an Increase in alcohol consumption that appears to be tolerated or even encouraged by adults (primarily parents) "

Hillsboro, Illinois "Lack of education, Interest, cooperation of parents Not enough interest with higher officials (e g , school teachers, church members, government officials, businesses, and senior citizens) "

Baraboo, Michigan "Lack of appropriate teen activities Lack of parental interest "

Jacksonville, Illinois "Decrease in the ability and willingness of individual family units to educate, Instruct, and monitor juvenile behaviors "

Nicholasville, Kentucky '(Alcohol is supplied willingly to Juveniles by a large number of adults Inhalants are available at any department store "

Brownstown, Indiana "Children, mostly high school age, come in contact with adults, ages 18-23, who are very willing to buy alcohol or sell drugs to their younger friends In addition, these children who do not have money on hand are likely to steal items and trade them for drugs or cash to buy alcohol and drugs "

SOURCE Off Ice of Technology Assessment, 1994

- Glass pipes, viles, stems, screens, shaker bottles (crack cocaine).
- Testing kits, scales, adulterants (heroin).
- Canisters, balloons, tanks (inhalants).

Head shops represent the most shrewd form of pro-drug marketing by targeting mostly young customers and providing the technology and products required to increase the ability of users to procure, prepare, hide, and ingest drugs. Despite Federal legislation prohibiting the sale of drug paraphernalia (18 USC Ap4), heads shops continue to flourish. These shops can avoid the intention of the law because the definition of what constitutes drug paraphernalia is ambiguous and open to interpretation. Head shop owners will simply emphasize the legitimate use of their products. For example, they may sell a scale designed to weigh drugs as a product to weigh food for dieting purposes. Specifically, head shops contribute to the drug abuse problem by:

- sending a double message—if drugs are so bad, why is drug paraphernalia sold openly?
- operating, in some cases, in the guise of candy stores, exposing children to drug paraphernalia and stimulating curiosity about drugs;
- serving to facilitate the use, marketing, and sale of drugs;
- selling items designed as conversation pieces which serve to glamorize drug use; and
- becoming hubs for drug abusers, indirectly serving to increase crime in the neighborhoods in which they operate.

Another example of a marketing strategy used for licit substances and now being adapted for illicit substances is total marketing, which consists

of four basic strategies-promotion, product, price, and place—to maximize the exposure of a product in a positive light to the most likely consumer groups (4).

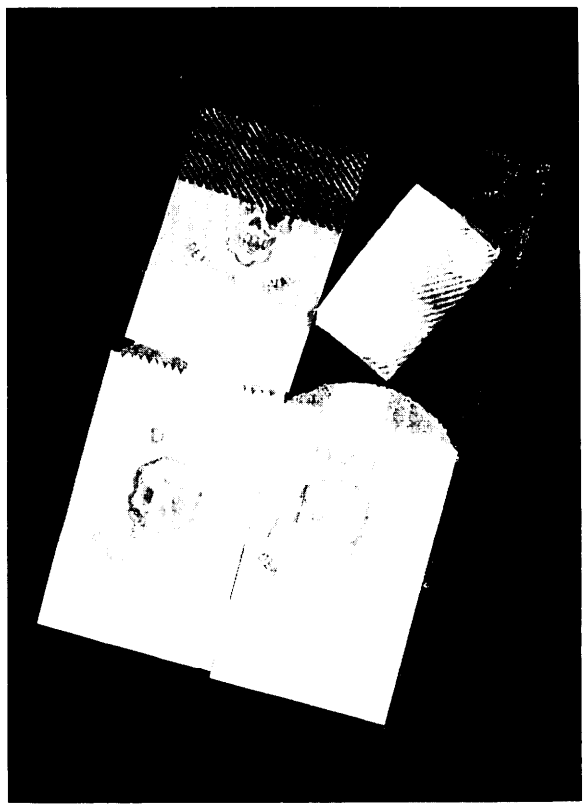
A key component of total marketing is promotion, or advertising particular product lines to appeal to particular subpopulations of the consuming public. Promotion is a standard practice in the marketing of legitimate products—it is also a very powerful force for manipulating consumer habits.

Promotion includes activities like advertising and sponsorship of sporting and entertainment events (7). For illicit drugs, promotional activities may include sponsoring a party in which the illegal drug is dispensed free or at a dramatic discount along with other attractions (e.g., sex, drug paraphernalia) (15).

Total marketing also entails the development of a product line that can be targeted to subpopulations within the larger consumer community. For example, alcohol and tobacco manufacturers will produce an array of products targeted at several consumer groups—premium beers for one group, wine coolers for another, rugged masculine cigarettes for one group, thin feminine cigarettes for another. Similarly, purveyors of illegal drugs have begun to develop product lines—powdered cocaine for one group, crack cocaine for another. The use of brand names is one technique used by marketers to establish a niche in the larger market, which is one reason people become unwilling participants in the marketing wars between Coke and Pepsi or Visa and American Express or even Bud and Bud Light.

A great deal of uniformity exists in the price, quantity, and quality of drugs sold in the same city, especially in the same neighborhood or street market. As a result, a dealer will occasionally try to capture a larger share of the market by increasing the weight or strength of the product and applying a brand name for recognition (3).

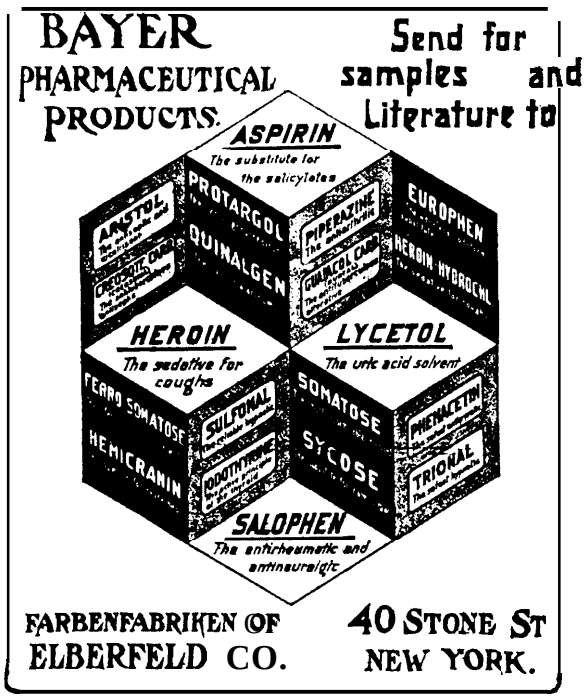
In Washington, DC, for example, brand name heroin is sold under the name of “Smurf,” “Mr. T,” “Brown Wrapper,” and “Black Poison.” Phency - clidine (PCP) is occasionally sold under the brand name “Hinkley” (after John Hinkley, the man who shot Ronald Reagan), ● ’Gofer” (a reference to a television character on the “Love Boat,” which is a popular street name for PCP), and “Keys to St. E’s” (a reference to a local mental institution). Crack cocaine is sometimes hawked under the brand names of “Conan,” “007,” and “Baseball. ”



PATRICIA M. TICE

Glycerine bags bearing the trademark “D, O. A.” for Dead on Arrival, one brand of heroin sold in Rochester, New York.

Pricing is the process of assigning a retail cost to each item in a given product-line that matches the ability of the targeted subgroup to pay. By producing a line of products at a wide range of prices, the purveyor of the goods can maximize the consumer population. For example, whether a consumer of tobacco products is smoking low-priced generic cigarettes from the supermarket or high-priced cigarettes from the tobacconist, that individual is included in the range of consumers. Illegal drug sellers also price their particular products to move. For example, while powdered cocaine may be too expensive for some economically disadvantaged consumers to pur-



THE BETTMANN ARCHIVE

Tetracetylmorphina, a derivation of morphine, was first synthesized in 1874, but the substance remained little known until the Bayer Company marketed the substance as heroin in 1898

chase regularly, almost everyone can afford a $5 vial of crack cocaine. Drug dealers also manipulate the cost for their goods to attract customers.

Once a product has been developed, promoted, and priced to move, a place must be found to most effectively sell the product. Legal nonmedical drugs are packaged and made available at retail outlets in such a way as to make their purchase as convenient as possible.

Wine coolers, for example, are a type of beverage aimed particularly at women and young people. With its sweet, light taste, low prices, and convenient packaging, the wine cooler competes with beer and soft drinks for occasions such as picnics and sports events, where traditional wine products are unlikely to be consumed. Wine cooler ads promote just these types of uses. Packaging has taken on a beer or soft drink look, and the industry is successfully obtaining access to convenience stores and supermarket outlets to make purchases easier (6).

Illicit drugs can also be packaged and made available at "retail" outlets where purchasers can conveniently obtain the product(s) of their choice. One news account suggests that "mass marketing that would have made McDonald's proud" is responsible for the evolution of crack cocaine from a drug derided as "garbage rock" just a few years ago into a national craze.

> Crack was not invented, it was creatcd by a sharp crowd of sinister geniuses who took a simple production technique to make a packaged, ready to consume form of the product with low unit price to entice massive numbers of consumers. Cocaine powder required an investment of nearly $75 for a gram, but a hit of crack costs as little as $5. Equally alluring was crack's incredible "high'' -an instantaneous euphoria because it was smoked-that could create addicts in weeks (16).

Two kinds of retail drug markets exist in the United States: the private market place and the open-air or flagrant drug markets (3). The private drug market involves transactions that occur between people who are known to one another or are referred by a trusted acquaintance. Referrals in the private marketplace are usually not very far removed from the original connection; they may be classmates in college, business associates, relatives, or persons belonging to the same club.

The familiarity of the parties in the private drug market usually means that there is a reduced level of public exposure and violence. The desire to keep the flow of traffic to the site of transactions at a minimum means that sales in the private marketplace tend to be of larger quantities of drugs than those in street transactions. Because most of the transactions take place "behind closed doors" or in some other clandestine fashion, a high degree of impermeability exists in the dealer-customer relationship (3). Examples of private drug markets include "speakeasies" during prohibition and the "traditional" (i.e., before crack) cocaine markets.

Another aspect of the private drug market is the ritualistic aspect of procuring the product. Consider, for example, the ritual associated with pur-

chasing cocaine. One author describes "a day in the office" of a street-level cocaine distribution network. The office itself is a highly structured operation, complete with receptionists to screen potential customers, guards, a "catcher''--held on retainer to retrieve cocaine thrown out of a window during a bust—and the merchant who sets prices, arranges to barter goods and services, gives credit, and makes day-to-day decisions regarding sales (15).

A typical transaction involves a positive identification of the buyer, a greeting and brief social contact (e.g., handshake, hug, kiss) between the merchant and the buyer, a formal request for an amount of cocaine, and a discussion of method of payment (e.g., cash, barter). Sometimes the transaction involves a brief discussion of the relative quality of the drugs in the street, a sample of the drug available from this particular merchant, and possibly some haggling over price. The public weighing and packaging of the cocaine is central to this type of transaction. The scale, in fact, becomes a central point of power and authority in the business; only those with the highest level of trust and respect can operate the scale (15).

Open air and flagrant drug markets, on the other hand, tend to be far more impersonal and much less ritualistic than the private marketplace. Many of the concepts used by mass marketers of licit products are used in the flagrant marketplace—targeted consumer groups, small and widely affordable units of sale, prepackaged goods with fixed prices, convenient retail outlets. One research team describes the mechanics of a typical open-air drug market transaction:

> A car drives down a residential street with enormous apartment buildings on either side. Young men wave to the car; a few of the more aggressive dealers step into traffic to signal autos to stop. Even before the wheels have stopped rolling, several young men are at the window; "You looking?" says one. "Smoke, smoke. I've got crack. Whatever you want" says the other peering over his shoulder. The answer from the driver is simple and short: "Two dimes." Two small brown glass vials are exchanged for a 20 dollar bill and the transaction is over in a matter of seconds (3).

Although the exact method for conducting a transaction may vary slightly from place to place around the country, the essence of the transaction is remarkably similar across the United States. Flagrant or open-air drug markets have many of the same structural characteristics as legal marketplaces: demographic and product segmentation, brand loyalty, cartel pricing, aggressive salesmen working on commission, and careful recruitment of loyal and productive employees (3).

Alcohol and Tobacco

The marketing of legal yet addictive substances, especially tobacco and alcohol, has become controversial in recent years. Issues stemming from the marketing of licit substances include advertising, taxation, and labeling.

Advertising

Alcohol and tobacco products have long been advertised in the United States. In the 1950s and 1960s, these products were advertised with minimal restrictions. Following the Surgeon General report on the hazards of smoking in 1964 (1 3), public sentiment against cigarette advertising increased. The most famous example of Federal regulation is the ban on broadcast cigarette advertising in January 1971 resulting from the passage by Congress of the Public Health Cigarette Smoking Act of 1969 (Public Law 91-222). In recent years, attention has focused on legislative proposals to ban all forms of cigarette advertising, and to control the advertising of alcoholic products.

Taxation

The federal government currently levies excise taxes on alcoholic beverages and tobacco products. Excise taxes on all types of alcoholic beverages were raised in 1990 to their current levels. Currently, for example, beer (six pack 12-ounce cans) carries a 33 cent federal excise tax, a 750 ml bottle of wine carries a 21 cent federal excise tax.

BOX 4-5: Cigarette and Alcoholic Beverage Warnings

It is unlawful for any person to manufacture, package, or import for sale or distribution within the United States any cigarettes the package of which fails to bear one of the following labels

SURGEON GENERAL'S WARNING Smoking Causes Lung Cancer, Heart Disease, Emphysema, And May Complicate Pregnancy

SURGEON GENERAL'S WARNING Quitting Smoking Now Greatly Reduces Serious Risks to Your Health

SURGEON GENERAL'S WARNING Smoking By Pregnant Women May Result in Fetal Injury, Premature Birth, And Low Birth Weight

SURGEON GENERAL'S WARNING Cigarette Smoke Contains Carbon Monoxide

It is unlawful for any person to manufacture, import, or bottle for sale or distribution in the United States any alcoholic beverage unless the container of such beverage bears the following statement

GOVERNMENT WARNING (1) According to the Surgeon General, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects (2) Consumption of alcoholic beverages Impairs your ability to drive a car or operate machinery, and may cause health problems

SOURCE 36 USC 1331 27 USC 213

A pack of cigarettes carries a federal excise tax of 24 cents.

A number of studies in the 1980s focused on the impact of federal excise taxes on cigarette consumption. A 1986 study concluded that an 8- to 16-cent increase in the federal cigarette excise tax would encourage from 1 to 2 million young persons and 8,000 to 1.5 million adults to quit smoking or not to start. Thus, a tax increase could prevent hundreds of thousands of premature smoking-related deaths, while a tax decrease would contribute to the disease burden of tobacco (14). The General Accounting Office, in a review of the literature on teenage smoking and excise taxes, concluded that an increase in the cigarette excise tax would be an effective way to reduce teenage smoking (12).

Labeling

Federal law addresses the labeling of both cigarettes and alcoholic beverages. In both cases, Congress declared that the purpose of such labeling is to make sure the American public is informed about the potential health hazards that may result from consumption (36 USC 1331; 27 USC 213). Manufacturers of cigarettes must use one of four rotating warnings on each package, while manufacturers of alcoholic beverages must post a prescribed warning (see box 4-5). Proponents of labeling have stated that such warnings do not create legal restrictions, but only help to inform the consumer about possible health risks. Opponents of labeling have argued that no scientific proof exists to link labeling with reduced use or improved health.

SUMMARY

The second set of preconditions for drug abuse and dependency includes availability and marketing. A person cannot become a drug abuser unless a drug is physically available to be used. In addition, however, availability is affected by social norms (e.g., factors within the community conducive to drug use, including level of parental or guardian supervision, lack of consequences for alcohol and drug offenses, lack of alternative activities, portrayals of alcohol and other drug use by friends and the media as a glamorous and healthy activity), prices (economic availability), and personal values (subjective availability).

The primary focus of U.S. antidrug policy has been to attack the physical availability of illicit drugs through law enforcement efforts aimed at disrupting the production, transport, and sale of drugs. While this focus has increased drug-related arrests-nearly half of newly sentenced federal

inmates in 1991 were imprisoned on drug charges-illicit drugs are still widely available.

Marketing techniques for both licit and illicit drugs can alter social, economic, and subjective availability. Key components of marketing include the promotion and advertising of particular product lines to appeal to particular subpopulations of the consuming public; development of a product line that can be targeted to subpopulations within the larger community of consumers; pricing strategies to attract new buyers; and identification of retail outlets for sales.

Federal law regulates the merchandising of licit yet abusable substances such as tobacco, alcohol, and prescription drugs by placing a variety of restrictions on how such products maybe marketed. Despite current restrictions, debate continues as to whether and how a variety of legal drugs should be marketed.

Substance Use and Transitions to Abuse and Addiction 5

Substance use is another precondition and contributor to addiction, since one cannot become dependent on a substance without first using it, continuing its use, and passing through stages of progressively more serious use.

Patterns of progression from use to addiction are not, however, consistent or predictable for all individuals. They can vary widely, depending on numerous individual and contextual factors and on characteristics of the use itself, such as age of onset and the type, frequency, and quantity of substance used. While other chapters in this report focus on individual and contextual factors, this chapter focuses only on the characteristics of drug use itself that can contribute to the progression to abuse and addiction.

Researchers have failed to identify specific levels of substance use or of substance-related problems that clearly distinguish use from abuse (16). This is the case, in part, because substances can differ greatly in their abuse liability and, in part, because the same levels of use of a particular substance can affect the functioning of various individuals differently. For example, for some individuals, the initial use of certain substances may constitute substance abuse, because of the severe adverse consequences of the initial use itself. (Although abuse is usually associated with large quantities of substance use per occasion, resulting in either the risk of harm to others (e.g., drunk driving) or to self (e.g., blackouts), some in the prevention field define any initial use of an illicit substance as substance abuse, because the substance being used is illicit and should not be used.)

Although the distinction between use and abuse is unclear, the causes of substance use--especially initial or casual use—are thought to differ in man y cases from the causes of substance abuse

and addiction. Some researchers have asserted that substance use results primarily from social influences (e.g., peer pressure), while *abuse* results more from internal psychological and physiological processes (13). Others have reported, based on longitudinal data, that current substance use was related more to the early modeling of use by adults and to one's own prior use, whereas problem use was related more to early rebelliousness (22). A review of prevention programs also supports the conclusion that the factors associated with the initiation of use differ from the factors associated with escalation to abuse (23).

PATRICIA M. TICE

Material from the "Just Say No" campaign.

SUBSTANCE USE

Because substance use is necessary as a precondition to abuse and addiction, prevention efforts can be directed at initial use, continuing use, or progression in use to block the later development of addiction.

Possible goals are:

- Prevent initial use. One way to prevent substance abuse and addiction is to prevent any initial use. The surest way to succeed would be to keep abusable substances out of the community, since, if they are unavailable, they cannot be used. However, once the substances are available in a community, other preventive approaches can be tried, including scare tactics (as with a policy of zero tolerance, backed up by stem parental, school, and legal penalties for use), educational efforts (through media campaigns or prevention curricula in the schools), training in refusal skills, and promotion of safe nonsubstance-using activities. The lack of clear standards and penalties, credible information, and alternative activities may certainly increase the vulnerability of youth to the appeals of abusable substances, but the presence of such efforts has not guaranteed success in preventing initial use among all youth.
- Delay initial use. Another goal is to delay initial use as long as possible, thus delaying the point at which any progression from use to abuse to addiction can begin. Such an approach can provide at least some protection for some children—i.e., those who might otherwise initiate use at earlier ages and then more rapidly progress to abuse and possibly addiction. Early onset of substance use is often more severe than late onset and, as is discussed later in this chapter, early use of substances is one of the better predictors of subsequent problems. Thus, a delay in initial use may offer significant protection even if substances are used later on.
- Prevent, reduce, or control continued use. Another approach is to try to prevent current users from continuing or escalating their use of one substance or moving on to other substances with greater abuse liability. Many youth experiment with cigarettes, alcohol, and marijuana, but do not progress to problematic use of these or other substances. Others, however, do progress. Efforts to reduce, prevent, or control continued and progressive use, if successful, can protect individuals from the problems of abuse and addiction.

Preventing, delaying, reducing, or controlling the use of substances can help prevent abuse and addiction. Because of their directness and apparent simplicity, these goals can be very appealing. Detracting from their appeal, however, is that they can be difficult to achieve, especially for multi-

problem individuals in communities where abusable substances are widely available and aggressively marketed, and for individuals who may be physiologically predisposed to the continued and escalating use of substances.

In addition to being a precondition (without which abuse and addiction become impossible), substance use can also be an important contributor to later abuse and addiction, by affecting individuals physiologically, psychologically, and socioculturally.

Physiological Effects

Addictive substances affect processes in the brain, some of them operating through reward systems, and can produce drug tolerance and dependence. Tolerance manifests itself when, to produce a given response (e.g., a high), an individual must ingest more of a substance. Physiological drug dependence has at least two defining characteristics: the development of tolerance to the effects of the drug and the manifestation of symptoms of withdrawal on abrupt discontinuation or reduction in dosage. The development of physiological tolerance and dependence can contribute to the progression from use to abuse and addiction: as tolerance to a substance increases, an individual must ingest more of the substance to continue to obtain a given desired response; as dependency develops, an individual must continue to ingest the substance to avoid the unpleasant experience of withdrawal.

Psychological Effects

Substance use may contribute to further use and abuse through psychological means as well. For example, an initial successful experience of use may reduce an individual's fear about the substance, thus opening the way to continued use that can lead to growing tolerance and dependence.

Changes in expectations about the consequences of alcohol use have also been associated with increases in behavioral tolerance. Specifically, less impairment from drinking alcohol occurred when, after the ingestion, successfully performing certain tasks was rewarded, while all other variables that increase tolerance were controlled. Several recent studies and a literature review have found that the ingestion of alcohol increased when the rewards for alternative behaviors were constrained (24). Also, social drinkers who expect the effects of alcohol to be better than the outcomes of other activities may well be more likely to make the transition to abusive drinking. Such a hypothesis is supported by several studies that found that alcohol abusers identify a greater number of favorable consequences of alcohol consumption than do nonabusers (24).

OFFICE OF TECHNOLOGY ASSESSMENT

Buttons urging the use of a designated driver, developed by Mothers Against Drunk Driving (MADD) in conjunction with AAMCO Transmissions. The joint campaign targets specific times identified by MADD as especially susceptible to drinking and driving—summer, Labor Day, New Year's Eve, and St. Patrick's Day.

Continued use of substances can also impair the learning of skills, especially among the young, and the ability to remember lessons once learned. Developmental processes may be slowed, which may hamper decisionmaking, in general, and about the use of substances, in particular. However, the progression from use to abuse may also, in many cases, not be simply linear, as when individuals move in and out of substance abusing patterns, depending on the developmental stages and social and cultural situations and contexts that may be affecting them.

Sociocultural Effects

Sociocultural factors, triggered by substance use, can also contribute to progression in use. An individual who initiates use, for example, may begin to participate in a subgroup that encourages use, such as the patrons of crack houses, groups of heroin users, members of substance-using motorcycle gangs, adolescent peer groups, cocktail party groups, after-work beer groups, and groupies who follow certain rock bands. (In some cases, too, such groups and subcultures may provide the impetus for the initiation of use as well.) Such social and cultural environments encourage, reinforce, maintain, and increase substance use and abuse—all of which can develop after the initiation of use outside the group. Conversely, the lack of rewarding, substance-free alternative groups and activities may render individuals more vulnerable to the appeals of substance-using groups and subcultures.

STAGES IN THE INITIATION OF USE

Do individuals first use one substance (e.g., alcohol or tobacco) and only later use another (e.g., cocaine or heroin)? Are stages in the first use of different substances similar across cultures? Does the use of one substance (e.g., marijuana) directly increase the likelihood of later use of another substance (e.g., heroin)? Or is progression in use caused more by other mediating factors, such as multiple behavior problems? If so, might these other problems contribute to later use of certain substances even in the absence of the use of other substances earlier on?

The basic question about whether there are stages in the initiation of the use of different substances has been studied in the United States (9,11,12,21,27) and in Israel and France (l). While study results vary somewhat, the sequence most often reported is that alcohol and cigarette use come first, followed by marijuana use and then by the use of other illicit substances. Some variations in this sequence have been found for individuals of different sexes, racial and ethnic groups, and cultures. The idea that the use of some substances increases the likelihood of the use of other substances has led to several hypotheses.

The Stepping Stone Hypothesis

In its strongest form, the so-called "stepping stone" hypothesis asserted that the **use** of marijuana often or almost always led to violent crime and to the use of other illicit substances (28). This hypothesis has never been proved. An even earlier version of the steppingstone hypothesis goes back to the beginning of the 20th century, when the presumed progression from tobacco to alcohol to morphine use was presented as an argument for prohibiting both alcohol and tobacco. One observer commented that there was no strong evidence that the use of these substances causes progression from one to another; rather, some individuals are more prone to the use of multiple substances. Also, the criminalization of marijuana may have caused some marijuana users to move on to other illicit substances through contact with the subculture of illicit users (14).

The Gateway Hypothesis

More recently, a more moderate hypothesis, the gateway hypothesis, has been put forward. It asserts that use of certain substances increases somewhat the chances of progression to the use of other substances. For example, in one longitudinal study, men who had used both alcohol and cigarettes by age 15 had a 52 percent greater chance of using marijuana, compared to men who had never used alcohol or cigarettes by age 25 (26). For women, the increased chance of marijuana use among alcohol and cigarette users was 46 percent. Similarly, for the next stage, men who had used marijuana by age 15 had a 68 percent greater chance of initiating the use of other illicit substances, compared with those who had never used marijuana. For women, the increased probability was 53 percent.

Early and Frequent Use

A still more constrained version, but one that may be more predictive, suggests that early and frequent use increases the probability of movement to later levels in the sequence (12). For example, researchers have reported that early use of substances is associated with later problematic use (7,20).

Nonuse of a Substance at an Earlier Stage

Another hypothesis proposes that the nonuse of a substance at an earlier age reduces the chances of later use of other substances. A longitudinal study has found that the chance that an individual who had never used marijuana would move up a level to use other illicit substances was very low (26). This finding corroborated conclusions reached earlier based on a cross-sectional study (18).

Because of variations among communities and cultures, the search for a universal y applicable sequence in the initiation of the use of different substances may be less fruitful than the study of why there may be somewhat different sequences, depending on factors such as availability and social norms. The relative ease of availability of some substances (e.g., cigarettes, beer, wine) may well account for their frequent appearance at an early stage in the sequence of use. However, this may vary among cultures. In France, for example, wine is widely available and used both at an early age and at an early stage in the sequence. In other cultures, where wine is less available but inhalants are widely available and inexpensive, inhalants are used at an early age and early in the sequence. Use at a young age may be a marker, at least in some cultures, for other risk factors, such as parental substance abuse and other family problems, which can contribute to later substance abuse problems, independently of early and frequent use. For example, one study found that, irrespective of the age of onset of use, individuals who exhibited numerous behavioral problems in their youth moved on to problem substance use, no matter how early or late in their youth they began to use substances (20).

Limitations in the Research

Research into stages in the initiation of the use of different substances has itself evolved through stages. A number of issues, which have not been thoroughly addressed, remain:

- The identification of stages in the progression from use to abuse and addiction is more a description of the stages some individuals move through than a prediction of necessary stages for most individuals, since the majority of substance users do not move on to abuse. Reasonable questions are: What prevents some individuals from progressing from initial use to abuse and addiction? Are the obstacles primarily due to the absence of preconditions, such as biological and pharmacological preconditions or availability and marketing. Studying those individuals who do not progress from use to addiction may provide insights and lessons about how to prevent progression among those who do progress. Of particular importance are studies of the changing vulnerabilities and resiliencies of individuals in different developmental stages from childhood through adolescence, young adulthood, and adulthood.
- What is the role of substance use in progression to abuse and addiction? The initiation of use of a particular substance may often not be the most important contributor to the use of a substance higher in the sequence. Other factors directly related to use may play a larger role. For example, age of onset, quantity, frequency, techniques, and purposes of the substance use may be more salient. Longitudinal risk factor and expectancy studies have begun to look at the role of these other elements.
- Are some individuals more predisposed to use and abuse substances than others? Individual biological and psychological factors may also strongly influence which individuals progress from use to abuse.
- What environmental factors contribute to substance use and abuse? Availability, marketing, social norms, peer groups, subcultures, and settings that encourage substance use may also be key in determining which individuals progress.

Despite the need for greater understanding about the issues above, already completed research into stages in substance use has been influential in providing the basis for policy and program recommendations. The gateway hypothesis has encouraged some prevention advocates and program planners to focus on preventing or delaying the use of gateway substances (e.g., alcohol, cigarettes, marijuana) as a possibly effective way to prevent later use of illicit substances. Longitudinal studies have found that the use of cigarettes by youth can be a strong predictor of later problems with substances (17).

STAGES IN THE CYCLE OF USE, ABUSE, AND ADDICTION

One approach to the study of stages in substance use focuses not just on the initiation of use; but also on the continuation of use, maintenance and progression of use within a class of substances; progression across classes; and regression, cessation, and relapse cycles in use and abuse (2).

Initiation of Use

Initiation is clearly a key first step in the progression to more serious levels of use. Because substance use is often initiated during adolescence, most substance use research has focused on initiation of use among adolescents. However, most individuals who initiate substance use do not progress to harmful use. Also, the factors associated with such progression may often differ from the factors associated with initiation. Thus, the focus on the initiation of use during adolescence is not sufficient for an understanding of the progression from use to abuse and addiction.

Continuation of Use

After trying a substance for the first time, one person may say, "I won't be trying that again," while another may say, "That's for me." Although only limited research has been conducted on risk and protective factors associated with the transition from experimentation to continued use, the continuation of use can apparently be influenced by the pharmacology of the substance (e.g., whether it produces desired or pleasant experiences), the biology of the individual (e.g., whether specific individuals have genetic or acquired biological predispositions or intolerances to the use of specific substances), the availability and marketing of the substance (e.g., whether a substance is widely available, used, and accepted for use), other characteristics of the individual (e.g., at what developmental stage one is, and whether one has mental or emotional problems, which may be ameliorated at least temporarily by substances), and community contexts (e.g., substance-using subcultures or settings that strongly encourage and reinforce a continued use of substances).

Maintenance and Progression of Use Within a Class of Drugs

Maintenance and progression may include conformity with norms of consumption—for example, initial and continued heavy use of alcohol in a college fraternity. Progression with cocaine could entail movement from snorting to smoking or injection. College students in some fraternities and sororities with drinking traditions may be at higher risk for heavy substance use, especially of alcohol. But very little research has been conducted on the risk factors for maintenance of high levels of use or for progression within classes of substances to excessive use among this age group.

Progression in Use Across Classes of Substances

At this stage, an individual may try different substances for different, and often compensating, effects. For example, the antiemetic properties of tetrahydracannabinol in cannabis can be used to facilitate greater use of alcohol, alcohol or marijuana can be used to smooth out the aftermath of snorting cocaine, and heroin can be used for similar purposes after a binge with crack.

Regression, Cessation, and Relapse Cycles

The transition away from abuse may occur a number of times before an individual succeeds in getting off a substance or, failing that, remains

In the eighteenth and nineteenth centuries, artists depicted alcoholism as the "drunkards progress." This example, probably made around 7850, consists of six printed cotton banners,

dependent. It may also be influenced by the same factors, or kinds of factors, that contributed to the substance abuse problem in the first place, including the full range of biological and pharmacological factors, availability and marketing, individual emotional needs, or contextual factors.

STAGES IN PROBLEM BEHAVIORS

Does substance use itself contribute to conduct disorders, delinquency, and other problem behaviors? Do these behaviors then, in turn, contribute to the progression to more use and to abuse and addiction?

Adolescents who use substances, especially those that are illegal, are more likely than nonusers to exhibit various problem behaviors, including: early sexual experimentation, delinquent activities, eating problems, and psychological or psychiatric problems, including suicide and suicidal thoughts (10). Less is known, however, about the sequencing of these behaviors. The interrelations among the factors is likely to vary widely among individuals, but some sequences may predominate. Several such sequences have been proposed. One suggested developmental sequence, for example, includes six stages: oppositional (characterized by disobedience at home); offensive (including disobedience in school, fighting, lying); aggressive (physical attacks on others, theft at home); minor delinquency (shoplifting and status offenses, such as alcohol use, truancy, running away); major delinquency (break-in and entry, car theft, substance abuse, robbery, drug dealing); and violence (assault, rape, homicide) (15).

One of the few studies of problem behavior sequences looked at the order of initiation of four different substances, delinquency, and sexual activity, among a sample of black adolescents (3). For males, it found involvement proceeded gener-

ally from beer use to cigarette use, then to delinquency, sexual activity, marijuana use, and the use of hard liquor. For females, the progression was generally from cigarette use, to delinquency, beer use, sexual activity, marijuana, and hard liquor. For both sexes, delinquency and youthful sexual activity tended to precede the use of marijuana and hard liquor.

While a high correlation among problem behaviors has been frequently found, the sequencing of those behaviors is less clear. The early use of so-called gateway drugs, such as beer and cigarettes, may contribute to later problem behaviors, while the later use of marijuana, hard liquor, and other illicit substances may be more the result of extended participation in problem behaviors. More research is needed in this area if these hypotheses are to be better understood and tested.

KEY ASPECTS OF USE

Some research has focused on characteristics of substance use that can strongly influence the progression from use to abuse and addiction. In addition to the age of first use, these characteristics include the frequency, quantity, and type of substance used, and the technologies and purposes and expectations of use.

Age of First Use

Initiation into substance use at a young age is one of the most striking and often-found predictors of later problems, including abuse. For example, in one large community epidemiology study, men who first used substances before age 15 developed mental and behavioral problems in 51 percent of the cases, compared with 16 percent among those who began at age 18 or later. For women, the comparable figures are 39 and 12 percent, respectively. Other studies have also found problems later on associated with the earlier introduction to alcohol or other drug use (19).

This pattern seems to hold specifically for later substance use and abuse as well. Early use of substances was found to be associated with later problematic use (7,20). Another study estimated that, of the men who had initiated the use of marijuana by the age of 14,71 percent would be expected to initiate the use of other illicit substances by age 25, compared with 9 percent of those who first started at age 21 (12),

One report asserted that frequency of use was the mechanism through which early onset probably operates (12). However, another study concludes that preexisting conduct problems are a better predictor of later substance abuse problems than is early use (19). It found that, in individuals with many conduct problems, any use of a substance, no matter how late in youth, was followed by abuse.

Frequency and Quantity of Substance Used

When addiction occurs, it usually results from a period of increasing intensity and frequency of use (5,6). Although frequency has often been employed as a measure of problematic use, one study found that quantity of substance used, rather than frequency of use, was a more powerful predictor of disruptive and problematic use (21). Quantity and frequency are often related, but they are not identical. An infrequent user could go on a binge, where large quantities are consumed, that could be extremely harmful. By contrast, a frequent user, such as someone who drinks alcohol every day but in strict moderation, may not encounter substance-related problems (although a maintenance alcoholic may drink daily with no apparent intoxication, but with the later development of associated health problems). The quantity and frequency of substance use can be strongly affected by the availability and marketing of the substance and by the techniques or technologies for administering the drug.

Type of Substance Used

The type of substance used can also influence the chances of later substance problems. More addictive substances—those with greater abuse liability—will make restraint from continued and possibly escalating use more difficult. Cigarettes provide an example experienced by many individuals: nicotine is extremely addictive, and only a

minority of those who try cigarettes and continue to smoke them will be able to control or easily cut back on their use.

Techniques of Use

Techniques of administration can also influence the progression of substance use. The introduction of prewrapped, prepackaged cigarettes, together with wide] y distributed matches, was followed by the rapid escalation of cigarette use, and presumably addiction to nicotine, in the United States in the late 1800s and early 1900s. Similarly, the introduction of smokable free-base and crack cocaine, the administration of which is much more efficient than the snorting of powdered cocaine, led to an explosion of cocaine abuse and addiction, The Bahamas, for example, experienced a hundredfold increase in cocaine-related hospital emergency room admissions following the introduction of crack and free-base cocaine in the 1980s (8).

Expectations and Effects of Use

The expectations and effects of use can also reinforce use and influence progression from use to abuse and addiction. Research reviews have discussed some examples of the expectations and effects of using illicit substances that can reinforce their use and may increase the likelihood of progression to abuse and addiction (13,25). These purposes include:

- The reduction of negative feelings, including the use of stimulants to alleviate depression and weakness; psychedelics to combat boredom and disillusionment; alcohol to assuage feelings of guilt, loneliness, and anxiety; and tranquilizers, amphetamines, and sedatives to reduce painful feelings.
- The reduction of self-rejection. Some researchers have found an association between substance use and indices of insecurity, dissatisfaction with self, desire to change oneself, defensiveness, low self-esteem, and low self--confidence.
- The increase in potency. Increases in physical and sexual potency, daring, and toughness can be achieved by using specific substances in certain situations. This can be especially appealing to youth, who may be wrestling with feelings of powerlessness, dissatisfaction, and frustration.
- The expression of anger. Substances can heighten expressions of anger (e.g., in opposition to mainstream norms) or can medicate away anger and rage. Narcotics and hypnotics may help reduce rage, shame, jealousy, and impulses toward extreme aggressiveness.
- The achievement of peer acceptance. Peers often play the largest role in endorsing and encouraging substance use, and in supplying substances. The initiation, continuation, and progression of use can be important ways for individuals to gain acceptance into peer groups. This can be true in school (e.g., in a fraternity), at work (e. g., in a sales force that demands that one be able to "hold one's liquor"), in substance-using gangs, and among certain groups of artists (e.g., some contemporary painters and musicians).
- The seeking of euphoria. Many substance users, especial] y addicts, report favorably on drug-induced euphoria. Indeed, the prospect of euphoria may be the initial attraction of the substance. It can also encourage continued use, even to the point of addiction and negative consequences.
- The coping with problems. For some users, substances temporarily y alleviate problems they have been unable to resolve in other ways. While the problems may be causing emotional pain, the use of substances, especially for the young, can inhibit the development of other problem-solving skills and may alleviate symptoms only in the short-run, since the underlying causes of the problems are likely to remain unresolved.
- The reduction of overwhelming trauma. Posttraumatic stress (e.g., after a war, or after physical or sexual abuse) can result in the use of addictive substances, since use may temporari-

ly reduce fears, flashbacks, and other negative feelings.

- The suppression of appetite or hunger. Another function of using some psychoactive substances is appetite suppression. An extensive literature exists on the use of nicotine, from cigarette smoking, to control appetite and weight. This phenomenon often manifests itself in the negative: for example, current smokers (especially women) are reluctant to stop smoking for fear they will gain weight (4).
- The seeking of stimulus. Individuals who seek higher levels of external stimulation can also turn to substances, for a high, for hallucinations, for unpredictable effects.
- The regulation of affective and behavioral impairments. Those with mood disorders, such as depression, and behavioral impairments may find that some substances alter moods and allow them to modify behaviors.

The above expectations and effects might well be expected to contribute to more continued and progressively heavier substance use than would more casual purposes such as curiosity, experimentation, or recreational use. The more "serious" the expectations, effects, and functions of substance use, the greater the likelihood of continued use and abuse may be. As noted earlier, the use of substances, especially by the young, to address problems or to achieve feelings may impede the development of skills for managing feelings and behaviors and for solving problems, and thus may result in deficiencies in handling problems in life later on. Indeed, the use of substances at very young ages may even contribute to permanent changes in the brain that may contribute to further use and abuse. More research is needed to clarify the connections between the expectations and effects of use and the progression to heavier and more problematic use and abuse.

SUMMARY

Substance use, including the progression to heavier and more harmful use, is a precondition and contributor to abuse and addiction. Researchers have focused on stages in the progression of substance use in several ways. They have studied stages in the initiation of the use of different substances, finding a sequence that moves from the use of cigarettes and wine or beer, to the use of marijuana, then hard liquor, and finally other illicit substances. Because many individuals who use substances do not go on to substance abuse, and because use at one level does not guarantee use at a higher level, these stages are descriptive but not predictive.

In addition to the biologically and pharmacologically reinforcing properties of addictive substances that can lead to tolerance and dependence, key aspects of substance use that contribute to abuse and addiction include age of first use, the frequency, quantity, and type of substance used, and the techniques and expectations and effects of use.

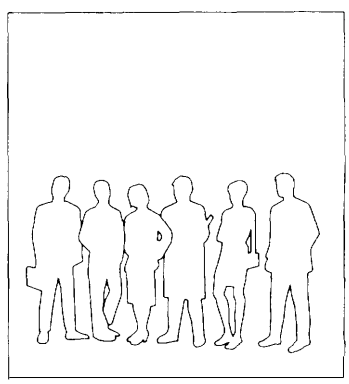
Part II: Individual Factors

Part 1 of this report addresses necessary preconditions that must be present in order for substance abuse and addiction to be possible. Flowing from the discussion of these preconditions, Part H highlights a selection of demographic, economic, and psychosocial factors that make some individuals more or less susceptible to substance abuse. Because of the complex nature of substance abuse and addiction, an inherent risk exists in reviewing individual factors in relative isolation. However, studies in the field of risk factor research have shown significant associations, for some individuals, between substance abuse and certain factors. Conversely, in the field of protective factor research, the lack of certain risk factors and the presence of other protective factors have been correlated with individual resilience to substance abuse and addiction.

Individual Risk and Protective Factors 6

No single or generic set of variables explains the misuse of substances for every individual. Depending on an individual's biological makeup, developmental stage, and interaction with various environmental forces, individual risk, vulnerability y, and resilience to substance abuse and addiction will vary for different factors at different times (3).

Much of the research on substance abuse has focused on identifying factors for drug and alcohol use (see table 6-1), specifically among adolescents and young adults. Risk factors for substance abuse have been identified as those cognitive, psychological, attitudinal, social, pharmacological, physiological, and developmental characteristics that foster initiation of drug and alcohol use and abuse by an individual. There is some consensus in the field of risk factor research that probably two fairly distinct sets of risk factors affect individuals differently. Social, situational, and environmental factors are likely to be more influential in *initial or low-level substance use,* while individuals who progress from use to *abuse or addiction* are influenced to a greater extent by biological, psychological, and psychiatric factors (27). This distinction between risk factors is more thoroughly discussed in chapter 5. Protective factors are those characteristics that reduce the risk of substance abuse and addiction and promote positive development such as, appropriate role models, involvement in positive peer groups, and a positive self-image and outlook for the future.



This chapter focuses on a select group of individual factors that has been combined under the three headings: Demographics,

TABLE 6-1: Risk Factors for Adolescent and Early Adulthood Drug Use

Catalano (1982)	Bry et al. (1986)	Newcomb et al. (1986)	Labouvie et al. (1989)	Hawkins & Catalano (1992)
Low grade point average	Low grade point average	Low academic performance	Low commitment to school	Low commitment to school
		Low educational aspirations	Cognitive Impairment	Cognitive Impairment
		Low achievement orientation	Intelligence	intelligence
				Academic failure
Lack of religiosity	Lack of religiosity		Low religious involvement	Low religious involvement
Early alcohol use	Early alcohol use		Early persistent problem behaviors	Early persistent problem behaviors
			Early onset high-risk behavior	
Low self-esteem	Low self-esteem	Low self-esteem		
		Self-derogation		
Psychopathology	Psychopathology	Emotional outbursts		
Poor relationship with parents	Poor relationship with parents	Low parental warmth	Poor, inconsistent family management practices	Poor, Inconsistent family management practices
		Parental hostile control	Family conflict	Family conflict
			Low bonding to family	Low bonding to family
			Alienation/rebelliousness	Allenatlon/rebelliousness
				Family drug behavior
	Lack of conformity		Attitudes favorable to drug use	Attitudes favorable to drug use
	Sensation seeking	Impulsity	Sensation seeking	Sensation seeking
			Attention defict/ hyperactivity	Attention defict/ hyperactivity
			Low autonomic and central nervous system arousal	Low autonomic and central nervous system arousal
			Hormonal factors	Hormonal factors
	Perceived peer drug use	Friends' deviance	Peer rejection in elementary school	Peer rejection in elementary school
		Negative activities with friends	Association with drug using peers	Association with drug-using peers
	Perceived adult drug use			
			Laws/norms	Laws/norms
			Availability	Availabilty
			Extreme economic deprivation	Extreme economic deprivation
			Neighborhood disorganization	Neighborhood disorgamzation
			School organization factors	
			Intergenerational transmission	

SOURCE Adapted from R Clayton, "Transitions in Drug Use: Risk and Protective Factors, " ir*Vulnerability to Drug Abuse,*M. Glantz and R. Pickens (eds), American Psychological Association, Washington, DC, 1992

BOX 6-1: Racial and Ethnic Differences in Adolescent Drug Use Among High School Seniors

Research on adolescent substance use has documented substantial racial and ethnic differences in use among high school seniors On average, alcohol, cigarette, and other illicit drug use is highest among American Indian youth, somewhat lower among white and Hispanic youth, substantially lower among black youth, and lowest among Asian youth Additional research explored the hypothesis that these dissimilarities could be partially attributed to differences in background (e.g , urban versus rural, family structure, parental education) and lifestyle factors (e g , grades, truancy, evenings out, religious commitment)

The findings Indicated that controlling for background factors alone did not account for most racial and ethnic differences in drug use, but it did reduce American Indians' relatively high levels of use, which suggests that their use may in part be related to disadvantaged socioeconomic status When both background and lifestyle factors were included in the analysis, the racial and ethnic differences were substantially reduced Educational values and behaviors, religious commitment, and amount of time spent in peer-oriented activities were particularly important explanatory variables

Racial and ethnic differences were also found in a study on drug-related attitudes and perceptions Perceived risk of using drugs, disapproval of drug use, and perceptions of disapproval of drug use by friends were typically highest among black seniors, at intermediate levels among Hispanic seniors, and lowest among white and American Indian seniors Conversely, perceived peer use of drugs and exposure to persons using various drugs for "kicks" were generally lowest among black and Asian seniors, at intermediate levels among Hispanic seniors, and highest among white and American Indian seniors

While these findings are not applicable for those adolescents who drop out of school, researchers are confident that the results are valid for the majority of adolescents who remain enrolled through the senior year of high school

SOURCE U S Department of Health and Human Services, Public Health Service National Institutes of Health, *Smoking, Drinking, and Illicit Drug Use Among American Secondary School Students, College Students, and Young Adults, 1975-1991,* NIH Pub No 93-3480 (Rockville MD 1992)

Economics, and Psychosocial/Behavioral. Factors not directly discussed in this chapter are reviewed in either Part I or 111 of the report. These factors may not appear in every individual with substance abuse and addiction problems, nor will all individuals exposed to these factors use or abuse drugs. In addition, unanimous agreement is lacking within the field of substance abuse and addiction on the importance, number, order of appearance, or interactive effects of many of these factors.

Where applicable, each of the factors has been reviewed in the following manner: historical perspectives; current prevalence; psychosocial and cultural antecedents; biological and genetic antecedents: relevant prevention programs; and areas for future research.

DEMOGRAPHICS

▮ Age

The preponderance of substance abuse research points to the fact that children who use drugs and alcohol before the age of 15 have a greater likelihood of becoming problem alcohol and other drug users, versus those youth who begin use at a later age (28).

Highlights from the National Household Survey on Drug Abuse (NHSDA) provide a somber picture of substance use among the Nation's children (77). Lifetime and past month substance use, rates for continued substance use, as well as differences in racial and ethnic substance use (see box 6-1) are reviewed in this section.

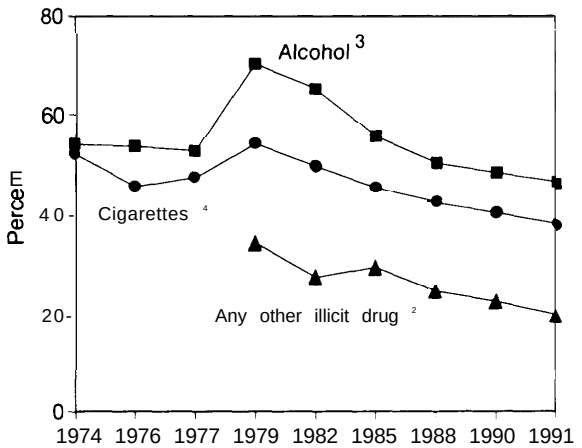
As part of NHSDA, data on lifetime use of alcohol and cigarettes (whose use is illicit for minors) has been collected for youth aged 12 to 17 since 1974; data collection on other illicit drug use began in 1979 (see figure 6-l). The lifetime use findings include:

- Rates in 1991 for lifetime use of alcohol, cigarettes, or other illicit drugs were the lowest recorded since the survey series began 17 years ago. The highest rates for any substance use appeared in the late 1970s.
- In 1979, 70 percent of youth aged 12 to 17 reported some lifetime use of alcohol compared to 46 percent in 1991. Since 1979, lifetime cigarette use has dropped from 54 percent to 38 percent.
- Since 1979, the use of other illicit substances (methaqualone, inhalants, heroin, cocaine, phencyclidine (PCP), crack, tranquilizers, stimulants, other opiates, barbiturates, nitrites, lysergic acid diethylamide, hallucinogens, and marijuana) has followed a similar trend with rates decreasing from a high of 34 percent to the 1991 rate of 20 percent.

A complementary study of adolescents shows 1991 data for substance use within the past 30 days among a sample of approximately 17,500 eighth graders, 14,800 tenth graders, and 15,000 twelfth graders (75).

- Any alcohol use within the past 30 days was reported by 25 percent of the eighth graders, 43 percent of the tenth graders, and 54 percent of the twelfth graders. Having had more than five drinks in the last two weeks was reported by 13 percent of the eighth graders, 23 percent of the tenth graders, and 30 percent of the twelfth graders.
- Fourteen percent of the eighth graders, 21 percent of the tenth graders, and 28 percent of the twelfth graders reported smoking cigarettes within the past month. Those who smoked more than one-half pack per day included 3 percent of the eighth graders, 7 percent of the tenth graders, and 11 percent of the twelfth graders.

FIGURE 6-1: Trends in the Percentage of Youth Aged 12 to 17 Reporting Use of Any Illicit Drug, Alcohol, and Cigarettes in Their Lifetime:[1] 1974-1991



NOTE The exclusion of inhalants in 1982 is believed to have resulted in underestimates in any illicit use for that year, especially for youth aged 12 to 17

1 Data not available for all survey years

2 Use of marijuana or hashish, cocaine (including crack), Inhalants, hallucinogens (including PCP), heroin, or nonmedical use of psychotherapeutics at least once

3 Estimates before 1979 for alcohol may not be comparable to those for later years due to change in methodology

4 For 1979, Includes only people who ever smoked at least five packs

- The other most commonly used substance for eighth and tenth graders was smokeless tobacco with 7 and 10 percent reported, respectively. Eighth graders had the highest percentage of past month inhalant use (4 percent), and of those individuals, approximately 1 percent reported using inhalants on 3 to 5 occasions within the past month.
- For tenth and twelfth graders, the other most commonly used substance was marijuana and/or hashish with 9 percent of the tenth graders and 14 percent of the twelfth graders reporting past 30-day use. Of those individuals, approximately 2 and 3 percent, respectively, had used marijuana and/or hashish on three to five occasions.

Another important indicator of potential substance abuse problems among adolescents is the noncontinuation rate for the use of certain substances. This is an indication of the extent to which people who try a drug do not continue to use it, and is based on the number of individuals who reported ever using a drug divided by the those who have not used the drug in the past 12 months (75).

Among a sample of twelfth graders in 1991, the data show that noncontinuation rates vary widely among the different drugs, with the highest rates observed for methaqualone and inhalants (62 percent). As mentioned previously, inhalant use is higher among younger individuals. The noncontinuation of methaqualone may be due, in part, to the decrease in its availability. A high noncontinuation rate is also seen for heroin (56 percent), cocaine (55 percent), PCP (52 percent), and crack (52 percent). Marijuana has one of the lowest noncontinuation rates (35 percent) in the senior year of any of the illicit drugs; primarily because a relatively high proportion of seniors continue to use it at some level over an extended period of time.

Additionally, the noncontinuation rates for alcohol and cigarettes are extremely low. In other words, 88 percent of the seniors reported some lifetime use of alcohol, and of those individuals, 78 percent have continued to use it within the past year, thus only 12 percent of the seniors reported no alcohol use in the preceding 12 months. Cigarette noncontinuation was defined somewhat differently, as the percentage of those who said they had ever smoked "regularly" and who also reported not smoking at all during the past month. Of the regular smokers, only 17 percent stopped smoking within the past month.

An obvious drawback to these data is the fact that only those individuals who have not dropped out of school are included in the survey. It is not unrealistic to assume that those students with serious drug problems may well have left school before the twelfth grade. More specific discussion of the factors that influence the risk of adolescent substance abuse, as well as prevention programs targeting youth, are thoroughly reviewed in chapter 8.

While the majority of attention is focused on adolescent substance use and abuse, young adults and older adults also show significant levels of substance use and abuse. The 1991 statistics from the NHSDA reveal that heavy drinking (defined as drinking five or more drinks per occasion on 5 or more days in the past month) was reported by 2 percent of 12 to 17 year olds, 11 percent of 18 to 25 year olds, 7 percent of 26 to 34 year olds, and 4 percent of those 35 and older (77). For those same age categories, smoking a pack or more of cigarettes per day was reported by 1, 13, 17, and 17 percent, respectively. The illicit substances reported being used most often in the past month among all age groups were marijuana and hashish. Individuals 18 to 25 had the highest percentage (13 percent) and those 26 to 34 the next highest percentage (7 percent). The second most commonly reported illicit substance was the nonmedical use of psychotherapeutics, which was again highest among 18 to 25 year olds (3 percent) followed by those 26 to 34 (2 percent); all other age groups reported less than 2 percent,

Clearly then, the heavy use of some substances is not exclusive to adolescents. Young- to middle-aged and older adults can also be exposed to stressful risk factors, such as loss of a job, divorce, or death of a child, which could contribute to alcohol or drug problems. The adult population presents unique and often overlooked challenges for the planning and implementation of substance abuse prevention programs.

Gender

Historically, the vast majority of biological and behavioral substance abuse studies were conducted on male participants, although that has begun to change. A distorted picture emerged, in which women were assumed to misuse the same substances, and for the same reasons, as their male counterparts. It has only been within the past 10 to 20 years that separate research has been conducted on the causes and consequences of alcohol and drug problems among women.

TABLE 6-2: A Comparison of U.S. Population Estimates and Percentages for Alcohol, Cigarette and Illicit Drug Use Among Women and Men 12 Years of Age and Older: 1991

Extrapolating percentages garnered from the National Household Survey on Drug Abuse to United States population figures produced the following approximations:

	Women (about 106 million)	Men (about 98 million)
Alcohol use within the past month	46.2 million	56.5 million
	44 0%	58. 0%
Heavy alcohol use[1] within the past month	1,2 million	4.9 million
	2.4%	8.6%
Smoking one pack+ of cigarettes per day	35 million	4.9 million
	12.9%	17.2%
Nonmedical past month use of psychotherapeutics	1.7 million	1.5 million
	1.7%	1 .5%
Past month use of an illicit substance[3]	54 million	7.3 million
	5.2940	7.6%

[1] Defined as having five or more drinks on one occasion on five or more days in the past 30 days
[2] Sedatives, tranquilizers, stimulants, analgesics
[3] Marijuana, inhalants, cocaine, hallucinogens, heroin, nonmedical use of psychotherapeutics.

SOURCE Off Ice of Technology Assessment, 1994, derived from U S Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Household Survey on Drug Abuse Highlights 1991, DHHS Pub No (SMA) 93-1979 (Rockville, MD February 1993)

Women have not been immune to the harmful effects of alcohol and other drugs. In the late 1800s twice as many women were addicted to narcotics as men. The majority of these women were white, middle-aged, and of upper-middle class status. Some had become addicted through the prescription of narcotics for a host of so-called female problems, while others knowingly misused opium, heroin, morphine, and cocaine (53).

The number of women drinking alcohol and experiencing alcohol-related problems has risen steadily since World War II. At least one-third of the estimated 18 million alcoholics and problem drinkers in the United States are thought to be women. These figures, which many consider to be conservative, would suggest that close to 6 million women are currently dealing with the medical, legal, and social problems of alcohol misuse (53).

Overall, men report more frequent use of alcohol, cigarettes, and all illicit substances (except nonmedical use of psychotherapeutics) than women (79,77). However, this does not mean that there is not substantial alcohol and drug use among women (see table 6-2). Additionally, some gender and ethnic differences may be attributable to failure to survey hidden populations. The risk status of women who are not in the workforce, do not receive prenatal care, and are not visible through arrest, is less reliably known.

Neither men, nor women, should be considered homogeneous. For example, alcohol use and its misuse can vary widely between different racial and ethnic groups. Among men, Hispanics (60 percent) were slightly more likely to have used alcohol within the past month than whites (59 percent) or blacks (52 percent) (77). In general, white women drink more frequently than other women. Large numbers of Native American, Hispanic, black, and Asian women do not drink at all (70). Additionally, poor and minority women appear to come under closer scrutiny for alcohol and drug abuse than do financially secure or white women (see box 6-2). These racial and ethnic differences are more fully discussed in the following section.

Do men and women cite different reasons for the misuse of alcohol and other drugs? Over the last several decades within the United States, the socially defined roles for men and women have undergone substantial changes. When given a choice, many women have opted for the traditional role of a stay-at-home mother and homemaker,

BOX 6-2: Racial, Ethnic, and Socioeconomic Discrepancies in Mandatory Alcohol and Drug Use Reporting Practices for Pregnant Women

In one county of Florida, anonymous alcohol and drug tests were conducted on urine samples obtained from all pregnant women seeking prenatal care from both public health clinics as well as private obstetrical offices White and black women were discovered to have insignificantly different prevalence rates for alcohol or illicit drug use during pregnancy While black women used cocaine more frequently than white women (7 5 percent versus 18 percent), white women had higher rates of marijuana usage (14 4 percent versus 6 percent) The relative similarities between alcohol and drug use also held true for poor versus middle-class women However, the study also documented that after delivery, black women were 10 times more likely to have been reported to the health authorities for substance use during pregnancy than were white women Poor women also had a greater chance of being reported than middle-class women This study reflects a discrepancy in reporting practices among staff at some public clinics and private obstetrical offices, which appears to be influenced by an individual's social status as well as race

SOURCE I J Chasnoff H J Landress, and M E Barrett, "The Prevalence of Illicit-Drug or Alcohol Use During Pregnancy and Discrepancies in Mandatory Reporting in Pinellas County, Florida" *The New England Journal of Medicine* 322(1 7) 1202-1206, 1 9 9 0

while other women have pursued career paths that may or may not include marriage and children, and still others have attempted to combine the two. These fairly recent changes have brought pressures and risks many women had not been subjected to previously.

Women in the workplace are more likely to encounter drinking opportunities such as business lunches and office celebrations, where they may feel encouraged or even pressured to drink (53). Women have also been recently targeted by the beer, tobacco, and liquor industries, as well as by small-scale marketing by nightclubs and bars in the form of ladies' nights.

In the early 1970s, researcher Sharon Wilsnack postulated that some women may abuse alcohol to submerge those aspects of themselves that did not conform to the traditional female sex role, thereby allowing them to feel more acceptably feminine (53). More recently, several studies on female alcoholics have shown that women, more frequently than men, can pinpoint a specific traumatic life event that they believe precipitated their problem drinking. The crises identified most often by women included a partner's infidelity, the death of a family member, a child leaving home, postpartum depression, divorce or separation, infertility, gynecological problems, and menopause (39,53).

A similar study focused on the impact of various life events on alcoholic men and women. Alcoholic men placed significant importance on work-related events, marriage issues, sexual difficulties, and arguments with spouses. In addition to those events cited by the men, alcoholic women focused on social activities, family troubles, stillbirth and adoption, and death of a close relative (40).

While much of the substance abuse research has focused on alcohol issues, various researchers have examined the differences between men and women in their use of illicit substances with or without the presence of alcohol. For men and women cocaine addicts in treatment, the following significant differences were noted (40,41 ,35):

- Women had started to use cocaine at a younger age than men, conversely to what is generally found among opiate users and alcoholics.
- Women had a significantly lower level of social adjustment than male patients.
- Women patients were less likely to be employed, to hold high status jobs, to be self-supporting, and to be financing their own drug use.
- Women were more likely than men to cite specific reasons for their drug use: depression, feeling unsociable, family and job pressures,

and health problems; whereas men more often cited the intoxicating effects of cocaine as a reason for their drug use.

- Men reported experiencing more guilt (47 vs. 23 percent), whereas women noted that one of the desirable effects of cocaine use was a reduction in their feelings of guilt.
- Women were more often diagnosed with depression than men, and their depression took longer to treat, while men were more often diagnosed with antisocial personality disorder.
- Most men and women reported that they used cocaine to be more sociable.
- Women demonstrated a slower recovery than men, and had more residual problems.

Gender differences among opiate addicts have also been explored. Researchers have shown that female addicts are more likely than male addicts to have first been introduced to heroin by family members or others close to them, and to have experienced severe family disruption (36). The development of the women's opiate dependence is also more likely to be linked to the family's approval of use or the absence of clear disapproval of use, in combination with easy access to the drug (35).

Differences in marijuana smoking may also be partially attributable to gender. In a recent review, it was shown that men's marijuana smoking was tied more to the availability of the drug, while women smoking was affected to a greater degree by social influences, such as weekday versus weekend smoking, and the smoking of their male partners. Women have also been shown to increase their marijuana smoking during periods of anger and other unpleasant dispositions (41).

In addition to discovering some sociocultural dissimilarities, gender differences in biological and genetic susceptibility to substance abuse have been examined. The role of heritability and genetics in influencing individual susceptibility is more thoroughly discussed in chapter 3, thus the discussion in this section will concentrate on biological differences. Again, a large portion of these studies has concentrated on alcohol and its effects.

In the late 1970s it was reported that when men and women of comparable body weight were given equivalent doses of alcohol, women achieved higher blood alcohol levels. However, these findings have been challenged, as more recent studies have shown that if the blood alcohol level is based on total body water rather than weight, the difference in levels between men and women is insignificant (65).

Another avenue that has been explored in explaining the gender difference in blood alcohol levels has to do with the metabolism of alcohol. Based on findings from animal research, Mario Frezza et al. (25) investigated differences in the "first-pass metabolism" between men and women. Data from animal studies reveal that a significant amount of ingested ethanol does not enter the circulatory system, but rather is neutralized in the stomach by the enzyme alcohol dehydrogenase. Using a small study sample (6 alcoholic and 14 nonalcoholic men, 6 alcoholic and 17 nonalcoholic women) Frezza et al. investigated whether the first-pass metabolism and enzyme activity level varied between men and women, and alcoholic and nonalcoholic individuals. They discovered that both gender and chronic alcohol abuse had statistically significant effects on the first-pass metabolism of alcohol, specifically, the first-pass metabolism was considerably lower among alcoholic women compared to alcoholic men, which in turn was lower than nonalcoholic men. Similar findings were reported for the alcohol dehydrogenase activity level; with the highest activity levels (70 to 80 percent) found in the nonalcoholic men and women, less activity among the alcoholic men (37 to 46 percent), and the smallest activity level among alcoholic women (1 1 to 20 percent). To summarize, the women in general had lower rates of first-pass metabolism and lower levels of alcohol dehydrogenase activity, which both lead to an increase in the amount of ethanol in the circulatory system. The levels of enzyme activity further decreased among the alcoholic women and the first-pass metabo-

lism was essentially nonexistent, indicating little neutralization by the stomach.

Researchers have also been studying the effect of hormonal changes during the menstrual cycle on alcohol absorption rates. Alcohol absorption has been reported to vary during a woman's cycle—specifically, the rate of alcohol absorption increases premenstrually. However, data from other clinical and animal trials have disputed these findings (65).

What is clear from this type of biological research is that few firm conclusions can be made about gender differences in response to alcohol ingestion, and even fewer still about biological responses to drugs other than alcohol.

Nevertheless, the psychosocial differences that have been identified between the sexes could assist practitioners in the development of more gender specific substance abuse prevention programs. For example, because many women can pinpoint specific events in their lives that they believe contributed to their heavy alcohol or drug use, it would behoove professionals working with women to be cognizant of these factors. General inquires could be made at yearly physical or gynecological exams, which could also serve as informational sessions on the dangers of alcohol and drug use (39). In addition, special attention should be paid toward adolescent girls whose first experience with alcohol and drugs is often through a male family member or boyfriend.

Broadly speaking, there are basic gaps in knowledge concerning gender differences and substance use within virtually all the parts identified in this report: Part I-necessary preconditions; Part II-individual factors; and Part III-activity settings. Until these gaps are addressed, the practice of transferring data garnered from studies specific for one gender, to the other gender, is inaccurate and misleading.

Race and Ethnicity

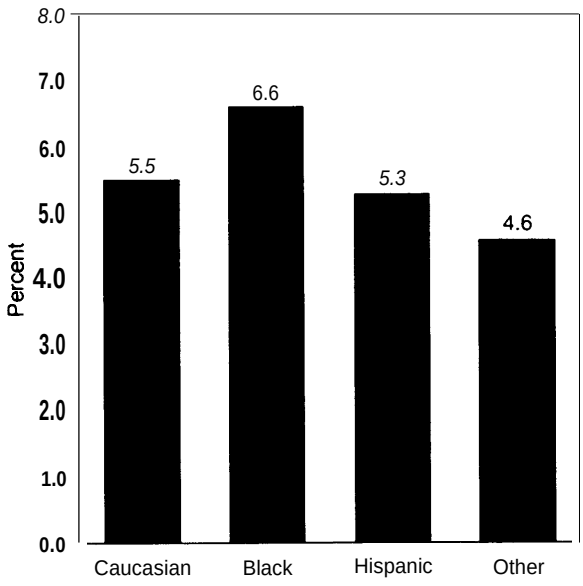
Historically, racial and ethnic minorities have been linked with, and often blamed for, many of the drug problems within the United States. Throughout the late 1800s and early 1900s, the general public associated the growth in opium addicts with the arrival of Chinese immigrants; although numerous physicians had been freely prescribing narcotic preparations to their patients, many of whom were middle- to upper-class whites. The drug cocaine has long been associated with blacks. A popular image during this time was one of cocaine-crazed blacks, although use of cocaine was widespread among whites as well (86). Throughout this same period, marijuana was thought to have been brought into the country and promoted by Mexican immigrants and later picked up by the subculture of black jazz musicians. Due in part to public paranoia, the Marijuana Tax Act of 1937, which was a direct attempt to control marijuana use, was born (45).

In the minds of many individuals, this derogatory link between minority populations and rampant drug abuse has continued. Certainly, many urban areas have high concentrations of minorities, and within these areas the prevalence of alcohol and drug abuse may be high. Often overlooked, however, is the existence of alcohol and drug problems in suburban and rural areas throughout the United States, which have varying percentages of minorities.

Prevalence rates for past month use of an illicit substance in 1992 (see figure **6-2) are** not drastically different between whites, blacks, and Hispanics, although it should be kept in mind that this statistic does not accurately reflect abuse or addiction. Even though the prevalence of illicit substance use was highest among blacks, over three-fourths (76 percent) of the past month illicit substance users were white. In other words, there were approximately 8.7 million whites, 1.5 million blacks, 885,000 Hispanics, and 315,000 individuals of other racial and ethnic groups who reported past month use of an illicit substance in 1992 (79).

Also for 1992 among individuals aged 12 and older, whites reported the highest percentage of alcohol use within the past week (21 percent), followed by blacks (19 percent), and Hispanics (18

FIGURE 6-2: Prevalence of Any Illicit Drug Use in the Past Month by Race and Ethnicity Age 12: 1992



[1]Illicit drug use includes marijuana, cocaine (including crack), hallucinogens, heroin, and nonmedical use of psychotherapeutics (stimulants, sedatives, tranquilizers, and analgesic

SOURCE U S. Department of Health and Human Services, Public Health Service, Substance Abuse and Mental Health Services Administration, "National Household Survey on Drug Abuse Population Estimates 1992, " DHHS Pub No (SMA) 93-2053 (Rockville, MD October 1993)

percent) (79). The rates for heavy drinking were not statistically different by race or ethnicity (5 percent for whites and blacks, and 6 percent for Hispanics) (78).

Until fairly recently, much of the analysis of substance use data has concentrated on the correlations between the use of a substance and one or two variables such as race and ethnicity and/or educational level. Often a positive association was found between minority populations and the use of certain substances. While statistically correct, these analyses can be simplistic and misleading (see box 6-3). Clearly many risk and protective factors interact to produce substance use and abuse. If the majority of these variables are excluded from the analysis, a skewed picture may arise as to the importance of certain variables as risk factors for substance use and abuse. Additionally, to simplify the data collection, racial and ethnic categories are often broad. The most popular groupings are blacks, white non-Hispanic, Hispanic, and other. Though each of these categories contains many distinct cultures, gross generalizations are commonly made within each category.

In recent years, there has been a shift toward analyzing more carefully the complex relationship between cigarette, alcohol and illicit drug use, and socioeconomic and demographic variables. The previous research had drawn on relatively small databases. However, in 1992, the National Institute on Drug Abuse (NIDA) critically analyzed the national drug use data collected in its 1988 and 1990 NHSDA. Predictors of drug and alcohol use included an extensive array of both individual variables (e.g., age, educational level, marital status) and aggregate variables based on the attributes of the census block, community, or region in which the respondent lived (see table 6-3 for a complete list).

The effect of select variables such as race and ethnicity were measured, while simultaneously controlling for all other variables (e.g., age, educational level, employment status). Individuals of racial and ethnic minorities were found to be no more likely than whites to use alcohol heavily (defined as having five or more drinks on five or more days in the past month) or to use marijuana, cocaine, or psychotherapeutic drugs (inclusion of crack or heroin in the analysis was impossible due to the small number of respondents reporting use). In fact, when socioeconomic status was controlled for, both blacks and Hispanics had a substantially lower likelihood of heavy alcohol use than whites (76).

A reanalysis of the 1988 NHSDA data was accomplished by an independent group of researchers who clustered the respondent data into neighborhood risk sets. The original analysis on the 1988 data revealed that for all ages, blacks and Hispanics were twice as likely to have ever used crack cocaine than were whites. Once neighborhood clusters were established, the data revealed that given similar social and environmental conditions, crack use did not differ significantly for blacks or Hispanics compared with whites (9).

BOX 6-3: Bivariate Versus Multivariate Analysis

Bivariate analysis is the process of taking one variable such as employment status and testing its correlation and statistical significance to reported alcohol or drug use A major drawback to this type of analysis is its relative simplicity; it does not control for the potential effects of other variables For example, if a relationship between being unemployed and heavy alcohol use was shown to be statistically significant, one could not be certain of the nature of the relationship Perhaps the individual was unemployed due to his or her heavy drinking Alternately, a person's unemployment could have caused his or her heavy drinking Furthermore, if more sophisticated analyses using additional variables were completed, the original association between being unemployed and heavy drinking could disappear altogether

Multivariate analysis, while having its own limitations, is a much more comprehensive way in which to study the relationships between several variables and alcohol and drug consumption The multivariate analysis used by the National Institute on Drug Abuse systematically incorporated a variety of individual variables such as educational level, employment status, race and ethnicity, and sex, in addition to certain aggregate variables including region (South, Northeast, North Central, West), metropolitan status, and racial and ethnic composition of census blocks Each one of these variables was then separately analyzed for its potential predictive value for alcohol and drug use, while the other contributing variables were also taken into account While multivariate analyses fall short of demonstrating causality, because additional variables are used to control for plausible alternative explanations, more confidence can be placed in the significant correlations found

SOURCE Off Ice of Technology Assessment, 1994

However, the number of reported crack users in the study was relatively small (138), and neighborhoods were identified as crack neighborhoods with as few as one reported crack user, thus the research findings should not be generalized.

The new research hypothesized that the previous racial differences found in the prevalence of crack cocaine smoking may have been due to macrosocial environmental risk factors including: differences in the availability of crack; employment rates; premature death rates; community contact with the criminal justice system; socially acceptable mechanisms for coping with life stressors; distribution of wealth; and access to social resources.

While both studies had specific limitations, the importance of these types of analyses cannot be understated. Focus should be placed on the interaction between communities and individuals and the relative influence on subsequent drug and alcohol use, rather than a person's race or ethnicity.

Race or ethnicity has not been shown to be either a biological or genetic risk factor for substance use or abuse. To date, the preponderance of investigative studies has focused on racial and ethnic differences in response specifically to alcohol. Virtually no study has been completed on differences in racial and ethnic biological responses to other licit or illicit drugs.

Individual metabolism of alcohol is essentially controlled by two enzymes, aldehyde dehydrogenase and alcohol dehydrogenase. If the enzyme aldehyde dehydrogenase is inactive for any reason, ingestion of even a small amount of alcohol can cause rapid and prominent facial flushing. Continued drinking leads to nausea, dizziness, palpitations, and faintness. This reaction is seen among many Asians (84,1 6).

A mutant form of alcohol dehydrogenase will effect the efficiency of alcohol metabolism as well. Altered forms of the alcohol dehydrogenase enzyme have also been reported in several *Asian* populations.

The two enzymes, aldehyde and alcohol dehydrogenase, probably interact in some individuals

TABLE 6-3: Predictive Models for Drug and Alcohol Use Among Respondents Aged 18 to 49: 1988-1990

	Alcohol			Marijuana		Cocaine	
Predictors[a]	**Abstinence in past month**	**Past month nonheavy use**	**Past month[b] heavy use**	**Any past month use**	**No past month use**	**Any past year use**	**No past year use**
individual variables:							
Age:							
26-34							
18-25				X[c]		X	
35-49					x		
Sex:							
Female							
Male		x	XX[d]	X			
Race/Ethnicity							
White							
Black							
Hispanic							
Other	x						
Education							
High school graduate							
Less than high school							
Some college							
College graduate							*x*
Occupation of CWE							
White collar							
Blue collar							
Service							
Did not work							
Aggregate variables:							
Region (South)							
Northeast				x			
North Central				x			
West				x			
Metropolitan status (large metro)							
Small metro							
Nonmetro	*X*						x
Percent Black in block (<5%)							
5%-50°A				x			
50%							
Percent Hispanic in block (<5%)							
5%-50%							
<50%							
Housing occupancy rate (90%-95%)							
<90%							
<98%	*X*						
Median housing value (Middle 60%)							
<20th percentile			x				
<80th percentile		*X*					
Percent owner-occupied (50%-90%)							
<50%							
<90%							
Marital status							
Married		*X*					
Divorced/separated		*X*	*XX*	*XX*		*XX*	
Never married		*X*	*X*	*XX*		*XX*	
Remarried		*X*					
Widowed							

TABLE 6-3 (Cont'd): Predictive Models for Drug and Alcohol Use Among Respondents Aged 18 to 49: 1988-1990

	Alcohol			Marijuana		Cocaine	
Predictors[a]	Abstinence in past month	Past month nonheavy use	Past month[b] heavy use	Any past month use	No past month use	Any past year use	No past year use
Employment status							
(full-time)						x x	
Part-time							x
Unemployed				x		x	
Homemaker	x						
Students	x						
Other							
Number of jobs in past 5 years (1 or 2)							
None	x						
3 or more			x	x		x	
Number of moves in past 5 years (none)					x		
1 or 2							
3 or more		x		x		x x	

a Reference categories to which others are compared are shown in parentheses
b Defined as five or more drinks on five or more days in the past 30 days
c Variables which are significant at p< .05 or less
d Highly predictive

SOURCE Off Ice of Technology Assessment, 1994, adapted from tables in National Institute on Drug Abuse, Socioeconomic and Demographic Correlates of Drug and Alcohol Use, 1992

to amplify the adverse reaction to alcohol consumption (57). Since this reaction discourages heavy drinking, the observation that it commonly occurs in some populations where alcoholism is relatively rare suggests that alcohol and aldehyde dehydrogenase mutations might be a major determinant of alcohol consumption, abuse, and dependence. This would seem to hold true for Taiwan and Japan where the reaction occurs in 30 to 50 percent of individuals. Research on these two enzymes among other racial and ethnic groups is scanty and inconclusive.

The role genetics plays in the heritability of alcohol and other drug problems has been studied for the past 30 years. While this topic is more thoroughly addressed in chapter 3, one point is worth mentioning here. Of the more than 30 family, twin, and adoption studies that have been completed, the vast majority have used white males as study subjects. Clearly, among different racial and ethnic groups the relationship between genetic heritability and increased susceptibility to alcohol and other drug problems is an area that deserves further study.

While race and ethnicity in and of themselves are not predictive risk factors for future substance abuse, by reviewing when, how, and why certain substances became problematic within different racial and ethnic groups, insight can be gained into the generational impact drugs have had on these populations. Four broad racial and ethnic groups (and one multiracial and ethnic group, see box 6-4) are discussed below in the following manner: historical perspectives; prevalence statistics; psychosocial and cultural antecedents; and selected prevention programs. A separate section on areas for future research is also included.

Native American Indians/Alaska Natives

There are more than 1.5 million Americans Indians and Alaskan Natives throughout the United States, with vastly different languages and cultural beliefs. Even within the same tribe there maybe a good deal of cultural diversity, since differences exist between reservation and rural tribal members, and those residing in urban settings. While urban dwelling American Indians may constitute

BOX 6-4: A Population at Risk—Migrant and Seasonal Farmworkers

Migrant and seasonal farmworkers (M/SFWs) are individuals "whose principal employment is in agriculture on a seasonal basis [and who have] been so employed within the last *24* months" (Public Law 100-386), Migratory workers are those "who establish for the purposes of such employment a temporary abode," while seasonal workers are those who meet the seasonal definition but are not migrant workers (Public Law 100-386), While seasonal is not explicitly defined in the public law, the Department of Agriculture defines a seasonal farmworker as one who performs 25 to 149 days of farm wage work in one year, and does not migrate,

Due to the transitory nature of the job and the employees, obtaining a precise estimate on the number of farmworkers is difficult. State data suggest that upwards of 4 million farmworkers are in the United States and Puerto Rico, and if ratios from the late 1970s hold true, approximately 30 percent (or 1 2 million) of these are migrants,

The racial and ethnic background of the farmworkers varies with the so-called "stream. " The East Coast stream is probably the most diverse with American blacks, Haitians, Jamaicans, Dominicans, Mexicans, Puerto Ricans, an increasing number of Central American Indians, and a small percentage of whites In the Midwest and West, the great majority of migrant farmworkers are of Mexican descent, although increasingly, Asian immigrants are making their way into the stream American Indians make up a substantial proportion of the farmworker population in the West and Southwest

Farmworkers are most often hired through a middle-person or "crewleader" who is usually in charge of negotiating length of employment, transportation, wages, housing, and meals It is not uncommon for migrant farmworkers to move anywhere from two to eleven times in a year Besides the physically taxing nature of the work, numerous environmental stressors (some unique to this population) increase the likelihood for alcohol and drug abuse, Some of these stressors include physically and socially Isolated camp locations; unsanitary overcrowded, and unsafe camp conditions, towns which often do not welcome the presence of farmworkers; long periods of separation from family members, feelings of boredom, isolation, and powerlessness, and language and cultural differences

The job's high mobility requirements hamper the collection of health data on this population. Anecdotal reformation from health care providers located at Migrant/Community Health Centers (M/CHCs) and local health departments cite alcohol and drug abuse problems as some of the most significant health issues faced by M/SFWs, followed by anxiety and depression (McCaw 1991) However, few quantitative or qualitative studies have documented substance abuse within this population One study

(continued)

more than 50 percent of the total Indian population, little is known concerning their health status (59).

The American Indians' introduction to alcohol dates back to the early 1600s and their initial interactions with European trappers and settlers. Much of the early trading between the Europeans and American Indians involved an exchange of alcohol. It was not long before alcohol became a considerable problem for many American Indian tribes. Some researchers speculate that because American Indians lacked a prior drinking history, or role model for moderate drinking practices, many tribes adopted a quick and copious style of drinking, consistently drinking to the point of intoxication. However, in other tribes, it is appears that being intoxicated was deemed unacceptable, and over time these tribes developed a "social" drinking style (35).

Prevalence statistics

Studies among American Indian adolescents have shown that prevalence rates for licit and illicit drug use vary insignificantly between tribes (5,4).

BOX 6-4 (Cont'd): A Population at Risk—Migrant and Seasonal Farmworkers

of black and Haitian farmworkers in upstate New York found that the majority of the heavy drinking on the migrant camps was done by older, single, black males, and that the drinking patterns of the study participants who traveled with their families differed little from Individuals in the general population To a large extent, this was attributed to the social controls family members exerted on one another (Mattera et al 1983) This is an important point, as the greater mechanization of farmwork has reduced the need for manual labor, and many of the farmworkers who previously traveled with their families can no longer afford to do so Anecdotal evidence suggests that the composition of the migrant workforce has been shifting toward one of single males, rather than families With this shift, a general decrease in social control among the migrant camps is likely to occur, and a greater number of alcohol and drug problems may begin to appear

Providing substance abuse prevention programs to M/SFWs is a challenge Few M/CHCs have the financial or personnel capabilities to implement substance abuse prevention programs Many farmworkers simply do not stay in one location long enough Language and cultural differences are vast, not to mention the geographical distances sometimes required to reach the camps, which often are located 20 to 30 miles away from the nearest social service and/or each other Two organizations (BOCES Geneseo Migrant Center in New York, NY, and Tri-County Community Health Center in Newton Grove, NC) have successfully Implemented similar types of programs based on the premise of providing weekend activities as an alternative to drinking and drug use. Full-day programs are normally held away from the camps, and include educational, creative, athletic, and cultural activities The activities are free and transportation is often provided However, farmworkers can attend only if they have not been drinking or using drugs

Clearly, greater research is necessary to adequately document the prevalence of alcohol and drug use within the migrant streams, as well as the changing composition of the streams, and how this may affect substance use Little is known about the differences in substance use between the varying racial and ethnic groups within the streams, and how the growing number of Immigrants from war-torn countnes will affect the health problems seen within the streams

SOURCES U S Congress, Off Ice of Technology Assessment, *Health Care /n Rural America, OTA-H-434* (Washington, DC U S Government Printing Off Ice, September 1990) K McCaw, "Migrant Workers, " *C//mea/ Manual of Substance Abuse,* J Kinney (ed)(St Louis, MO Mosby-Year Book, Inc 1991) G Mattera, J Watson, S Kunitz, et al "Alcohol Use Among Migrant Laborers, " unpublished report for the New York State Health Research Council, Albany, NY, 1983

However, compared to non-Indian youth, Indian adolescents consistently begin using alcohol, illicit substances, cigarettes, and inhalants at a younger age, at higher rates, and in combination with each other (10,60,69), With regard to alcohol, there is often a great deal of peer pressure to drink as the *Indian thing to do* (42). Studies have shown that Indian youth are three times more likely to be involved in alcohol-related offenses than their white or Hispanic counterparts. A 1982 study indicated that alcohol was involved in as many as 58 percent of Indian juvenile arrests (63 percent for males, 37 percent for females).

In some tribes, up to 30 percent of American Indian adolescents have used inhalants, most notably, gasoline and glue. The age group with the highest rate of inhalant use was 11- to 13-year-olds. Contrary to the popular belief that inhalant abuse occurs primarily among boys, research among American Indians revealed that eighth grade girls and boys were equally likely to have inhaled volatile substances. While the rate for Indian inhalant use decreases substantially among high school age youth (down to 4 percent), it is still 2.5 times greater than the rate for non-Indian youth of that age. Interestingly, while the rate of

inhalant use has remained relatively stable among Indian youth since 1984, there has been a steady rise of reported use among non-Indian adolescents (66).

While there is no substantial difference in alcohol use among various tribal adolescents, rates do differ between the drinking patterns of tribal adults. Contrary to the still pervasive drunken Indian stereotype, many tribes have levels of adult alcohol use *below* the national average (42). Consistent with the U.S. population as a whole, American Indian males are more likely to drink than females (42,35). In some tribes it is permissible for adolescent females to experiment with alcohol, with the understanding that when adulthood is reached they are expected to abstain or drink only rarely.

As is true for adolescents, adult Indians encounter an increased rate of legal complications due to alcohol and drug use. Data on urban American Indians has shown that while under the influence of alcohol and/or other drugs, they are arrested at four times the rate for blacks and 10 times the rate for whites (44).

Few statistics exist to quantify illicit substance use among the adult American Indian population. While alcohol is clearly a major problem for some tribes, future research efforts should include data on the use of illicit substances.

Psychosocial/cultural antecedents

The relationship between the majority of American Indians and the early settlers was suffused with violence, distrust, deceit, and perhaps more than anything, forcible and abrupt change. The food American Indians ate, how they dressed, where and how they lived, what language they spoke, tribal governing structures, and how they worshiped were, for the most part, forcibly altered to conform with the newly dominant society's cultural and moral views. While these involuntary changes occurred several generations ago, their impact on the American Indian culture should not be underestimated.

In some instances, tribal traditions, languages, and methods of worship were lost. Thousands of American Indian children, some as young as 3 years old, were removed from their families and placed in federally funded and run boarding schools, where physical, verbal, and sexual abuse were common. Nuclear and extended families were dispersed, and with them, a vital social support system. Acculturation issues abounded. Children returned home from boarding schools unable to speak their native language, or understand the importance of their cultural traditions. These cultural problems are multigenerational, and current studies reveal that American Indian children report more emotional problems, mental health problems, and low self-esteem than non-Indian children (60). While the relationship between many of these psychosocial/cultural antecedents and increased substance abuse levels has yet to be formally evaluated, clearly the American Indian people have been, and in some may continue to be, subjected to cultural disruption.

Prevention programs

For substance abuse prevention programs to be effective within the American Indian population it is important to realize the diversity that exists between tribes and villages. For example, a specific program tailored to New Mexico Navajos living on the Navajo reservation may be culturally unacceptable to Winnebago Indians living in urban Minneapolis, MN. However, several fairly universal themes permeate American Indian culture: the importance of tribal identity, which is an individual's membership or affiliation with specific tribe(s); a belief that each human is a multidimensional being made up of a body, mind, and spirit, and that the spirit world coexists and intermingles with the physical world; the importance of sharing and generosity, allegiance to one's family and community, respect for elders, noninterference, orientation to present time, and harmony with nature; the importance of an oral tradition as a primary method of teaching values, attitudes, legends, and stories; an emphasis on observant, reflective, and integrative skills which lead to communication patterns that give virtue to silence, listening, nonverbal cues, and learning by example; and the

presence of rituals and symbols that are acknowledged for their underlying significance, which is expected to emerge as time and experience go on (72).

One example that assists communities in the development of culturally sensitive programs is an instructional publication compiled by The Four Worlds Development Project in Alberta, Canada. Information has been collected on health promotion and prevention efforts by various indigenous people from around the world. The text assists American Indian communities in tailoring program planning, training, and implementation techniques with their culture beliefs and specific needs (24).

Blacks

A great deal of diversity exists within the black community. One reflection of that diversity is the use of the terms *African American* and *black*. Some researchers use *African American* to define black persons who are direct descendants of men and women brought to the United States as slaves, whereas *blacks is* used to define all people and cultures of African descent, including black people from the West Indies, Africa, and the Americas. At times, the two terms are used interchangeably (72). For this section, both terms will be utilized where appropriate.

Historically

Many of the first blacks to arrive in the United States did so as slaves. Plantation owners were responsible for regulating much of their slaves' alcohol consumption. During holidays, alcohol was routinely distributed to the slaves in reward for their loyalty and hard work, and the subsequent drunken revelries were tolerated. This controlled permissiveness began to change in the early 1800s, as clandestine groups of black slaves began their quest for freedom. It was at this point that blacks were prohibited from owning stills, or even being in possession of alcoholic beverages. These laws persisted after the Civil War, when technically, blacks had been granted citizenship (14).

Spanning the late 1800s through the late 1960s, hundreds of thousands of blacks left the South and, looking for work, headed for northern cities. This period was later described as the "Great Migration," with a total outmigration estimated at 4.3 million individuals (72,1 4). This outmigration contributed substantially to defining the large number of blacks currently found in many of the northern urban areas. Unfortunately, many of those seeking work did not find it, nor did they find that they were free from racism, discrimination, and oppression, Slowly, the numbers leaving the South decreased, and by the 1970s there was actually some migration back into the southern states by both northern-born blacks and individuals returning home after unsuccessful moves to the North.

Prevalence statistics

Differences in adolescent drug use among high school seniors by race and ethnicity were discussed earlier in this chapter (see box 6-A). Among this group, alcohol, cigarette, and illicit drug use was **lowest** among black and Asian youth, even after inclusion of background and lifestyle factors. Obviously, a drawback to this type of survey is that high school dropouts are not included in the analyses. The 1991 event dropout rate (which measures the proportion of individuals who dropped out of school over a specified time period) for grades 10 to 12, ages 15 to 24, reveal dropout percentages of 3.2 for whites, 6.0 for blacks, and 7.3 for Hispanics (63). While the event dropout rate for blacks is double that of white students, low alcohol and drug usage rates have also been found among black eighth and tenth graders, so the low rate of substance use among black twelfth graders cannot be due entirely to dropout rates (75).

While *use* of alcohol, cigarettes, and illicit drugs is relatively low among blacks, data on heavy or frequent use of such substances differs. The 1991 NHSDA data for individuals aged 12 to 20 found that 7.3 percent of whites reported heavy alcohol use (defined as having 5 or more drinks on

one occasion on **5** or more days in the past 30 days), Hispanics reported 3.9 percent, and blacks reported 2.7 percent. However, for those individuals aged 21 or older, heavy alcohol use did not differ significantly between whites and blacks (5.0 vs. 6.0 percent), but was significantly higher among Hispanics (6.6 percent) (77). Other studies on heavy alcohol use, by gender, have shown that white men aged 18 to 29 report the highest prevalence of heavy drinking, which then declined in subsequent age groups. Conversely, the abstention rate for black males was highest among those aged 18 to 29, while subsequent age groups showed significantly increased levels of heavy drinking—among whom half report either frequent heavy or frequent high maximum drinking (70). Similarly, white women in the 18 to 29 age group were significantly more likely to drink, and to drink heavily, than were young black women (67).

Past-month use (which does not necessarily constitute abuse) of an illicit substance by race and ethnicity was discussed at the beginning of this section (see figure **6-2).** However, the 1992 NHSDA also contains more specific data for some of the most commonly used substances such as marijuana and cocaine. Of the blacks age 12 and older surveyed, 3.2 reported using marijuana once a week or more compared to 2.5 percent for whites and Hispanics. Blacks also had the highest reported weekly use of cocaine (0.5 percent) compared to Hispanic and white percentages (0.4 and 0.3, respectively) (78).

Persistence of drug use has also been used as another indicator of substance use severity and is measured by percent of monthly users divided by percent of lifetime users. It has been shown that blacks and Hispanics have a different pattern of drug persistence from that of whites. Data on cocaine use analyzed from the 1990 NHSDA showed that the persistence rate for blacks age 18 to 25 was almost three times that of whites (.29 vs.. 09), and among those aged 26 to 34, the rate for blacks was four times higher than that for whites (.21 vs. .05). In both age groups, the persistence rates for Hispanics were between those of blacks and whites. It is important to note that the differences in persistence did not appear to extend to alcohol and marijuana (32).

Psychosocial/cultural antecedents

At least initially, many blacks did not arrive in the United States voluntarily. The legacy of slavery has shaped much of black culture. Black slaves struggled with many of the same issues as American Indians: loss of languages, traditions, and religious beliefs; assimilation and acculturation issues; and the breakup of nuclear and extended families. Not allowed to express their original languages, cultures, and beliefs, blacks attempted to establish new cultural identities amidst oppression, segregation, and racism.

Hypotheses concerning alcoholism among black males have been proposed by several studies. Some researchers believe that the increase in the number of heavy drinkers among black males in their thirties may be due to feelings of frustration and failure concerning career expectations. A complementary view points to the combination of high unemployment rates among black males coupled with the large numbers of liquor stores found in many urban black neighborhoods, as having contributed to the alcohol problems faced by black men (14,82).

Prevention programs

With respect to the use of alcohol and other drugs, common themes link blacks. In general, social stratification, church and community involvement, and racial identity are thought to be important variables in attitudes toward alcohol and drug use (72, 14). The level of importance will vary between individuals and groups depending on environmental factors. One program cited as exemplary by the Center for Substance Abuse Prevention (CSAP) is called Super II, and targets primarily at risk, black inner-city youths 11 to 17 and their parents. The design and implementation of the program emphasizes holism and cultural competence, viewing them as crucial in reducing the strength of risk factors and increasing the strength of resiliency factors. The program takes place through already established agencies in the communities (Boys Clubs and Girls Clubs) and incor-

porates the childrens' caregivers, youth and recreational workers, police officials, local corporations, and a variety of social service agencies. The first-year evaluation report found reductions in four of five major categories of alcohol- and drug- related behavior. These included frequency of use and amount of use, number of modalities of use, alcohol- and drug-related behavior problems, and media influenceability (71).

Another antidrug abuse campaign is being waged by the Congress of National Black Churches, Inc. (CNBC), a national nonprofit religious organization comprised of a variety of denominations. Through a variety of programs, the CNBC clergy are mobilizing, creating, and coordinating groups of individuals interested in bringing about positive change in their communities. Program strategies are implemented in partnership with the police, criminal justice agencies, school systems, social service agencies, private organization and businesses, and informal community networks to reduce the supply of and demand for drugs.

Hispanics

Historically

The term *Hispanic* was first used by the U.S. Census Bureau in 1980 to designate those individuals who resided in the United States and whose cultural origins were in Mexico, Puerto Rico, Cuba, Central America, and other Latin American countries. Not all members of this group accept the term and prefer to use phrases such as *Latino* or *la raza* (literally, "the race"). Data from the 1990 census reveal an Hispanic population of more than 20 million, and projections indicate that Hispanics will be the largest minority group in the United States sometime between the years 2000 and 2010. Hispanics of Mexican origin, by far the largest Hispanic group (63 percent), are clustered in the southwest, particularly California and Texas. Puerto Ricans, excluding those living on the island of Puerto Rico, are the second largest subgroup (12 percent) and live primarily in the Northeast, especially in and around New York City, New York. Cubans (5 percent) live primarily around their port of entry, Miami, Florida, though large numbers are found in New Jersey and New York. Dominicans, who reside primarily in the Northeastern Atlantic States, are also beginning to grow in number. In the past 10 years, there has been a large immigration of Central Americans to the United States. These individuals have come primarily from civil war-plagued countries including Guatemala, El Salvador, and Nicaragua. It is highly possible that many of the problems faced by newly arrived Hispanic immigrants maybe exacerbated among this population who have left their countries involuntarily. Refugees escaping political turmoil or open warfare often show signs of Post Traumatic Stress Disorder (72).

Prevalence statistics

NIDA data collected from 1975 to 1991 on drug use among twelfth graders, as well as data from 1991 for eighth and tenth graders, reveal the following for Hispanic students: as a group, Hispanic youth had the highest lifetime and annual prevalence rates in the senior year for PCP, cocaine, crack, heroin, ice, and steroids, compared to whites and blacks, and the rates for crack and steroid use were particularly high; among eighth graders, Hispanics had higher rates of past month use for virtually all the drugs surveyed including, cocaine, heroin, inhalants, alcohol, marijuana, hallucinogens, and cigarettes. In other words, in eighth grade, before a considerable number of students has dropped out, Hispanic youth have the highest prevalence of nearly all drug use, but by twelfth grade, whites have the highest usage rates. The researchers suggest two possible explanations, which are not necessarily exclusive. The first being that the high dropout rate for Hispanics in later grades (in some areas as high as 40 percent) is causing a shift in the rates, and the second is that while Hispanic youth begin experimenting earlier, white youth catch up by the later grades (75).

National statistics for 1992 of past-month use of any illicit substance indicated that rates for Hispanics and whites were not significantly different, and were slightly lower than those for blacks (see

figure 6-2). The same database also revealed that for the illicit substances measured, Hispanic rates either fell between black and white rates, or were the lowest rates reported by an ethnic group. The only exception would be the heavy alcohol use data (defined as having 5 or more drinks on one occasion on 5 or more days within the past 30 days) for 1991 (1992 data not yet available) which showed that Hispanics aged 21 or older reported significantly more heavy alcohol use within the past month as compared to whites and blacks (77).

Psychosocial/cultural antecedents

Dignidad, respeto, confianza--dignity, respect, and trust—are important elements in the Hispanic culture. Like many immigrants to the United States, Hispanics deal with language, cultural, racial, and economic barriers. These barriers and how they are handled within the Hispanic culture have a great deal to do with subsequent alcohol and drug problems. To a large extent, drinking (at times heavily) among Hispanic males is not only expected, but encouraged. Much of the research literature has therefore centered around alcohol and its misuse. To be able to drink heavily and maintain "control" is a valued characteristic among most Hispanic men (38). Personal identities for a vast majority of Hispanic men are intricately entwined with the notion of *machismo,* which generally connotes strength, masculinity, independence, and responsibility (1). The man of the family is expected to provide for and take care of his wife and children. For those who may be unable to fulfill this role, due to difficulties learning English and/or procuring employment, the social drinking pattern can change from one of low frequency and high quantity, to high frequency and high quantity (38,1). This drinking pattern varies between Hispanic groups, however. A study completed in 1981 found that drinking levels among newly arrived Dominicans, Guatemalans, and Puerto Ricans, when compared to preimmigration levels, decreased, increased, and remained the same, respectively (1).

As is relatively true for other cultures, heavy drinking is not condoned for Hispanic women. This is not to say that it does not exist. While the majority of first generation Hispanic women generally abstain or drink very little, changes in drinking patterns among the following generations have been observed. To the distress of many first generational Hispanic families, as their daughters and granddaughters become increasingly acculturated, the drinking patterns and alcohol problems more closely mirror those found in the general population (26). Another change observed among more acculturated Hispanic women is the diminishment of *marianismo,* which is the female complement to *machismo,* and encompasses such behaviors as submissiveness, humility, tolerance, virtuosity, and devotion to the male (whether father, husband, or first son).

Prevention programs

Important intergroup differences need to be understood for the planning, implementation, and evaluation of substance abuse prevention programs. For example, while two immigrants, one Mexican and the other El Salvadorian, may both speak Spanish and may both be experiencing many of the same difficulties in adjusting to life in the United States, they are very likely to have had vastly different lifetime and cultural experiences (72).

Funds from CSAP as well as the National Institute on Alcohol Abuse and Alcoholism (NIAAA) have been distributed to several demonstration projects throughout the United States and Puerto Rico that target high-risk Hispanic youth and their families. Many of these programs are similar to others previously outlined in this report in their attempt to be as comprehensive as possible through the coordination of families, schools, law enforcement, and local social services and businesses. Several of the programs are creating their own audiovisual and written materials in Spanish, others are utilizing activities such as English courses, puppet shows, and live theater performances, while others employ peer group counseling and mentoring programs (69).

Asian and Pacific Island Americans

Historically

According to the U.S. Census Bureau, Asian and Pacific Island Americans are the fastest growing population in the United States. Between 1980 and 1988, the number of Asian and Pacific Island Americans increased by 76 percent compared with an increase of 36 percent within the Hispanic population. Similar to the other racial and ethnic categories, the term Asian and Pacific Island American gives one the impression of homogeneity, while in reality, over 60 different racial and ethnic groups are lumped in this bracket. Some of the diverse populations included in this group are Hawaiians, Guamanians, Filipinos, Thais, Bengalis, and Sri Lankans. Beside the obvious differences in language, and cultural norms and beliefs, is the degree to which different subpopulations have acculturated and/or assimilated to the dominant culture. Many Chinese and Japanese families have been in the United States for three generations or more, which is in sharp contrast to the majority of first-generation Vietnamese, Koreans, Asian Indians, and Filipinos (72,85).

Prevalence statistics

Research on substance use and abuse within the Asian and Pacific Island American population appears to be sporadic, and often limited to alcohol. While the three national surveys NHSDA, the National Adolescent School Health Survey, and the High School Senior Survey, all collect separate data for Asian and Pacific Island Americans, only the High School Senior Survey routinely analyzes the data separately. Due to small sample sizes, the remaining two surveys included Asian and Pacific Islanders under the racial and ethnic category of "other."

Research on alcohol consumption patterns among adult Asian and Pacific Island Americans consistently shows that this population drinks substantially less than whites and Hispanics, and slightly less than blacks. Though subgroup variation does exist, as data reveal, native Hawaiians drink at levels comparable to those of whites, among mainland Asian Americans, Japanese Americans drink the most, followed by Koreans and Chinese Americans. However, Japanese, Korean, and Filipino men all have roughly the same percentage of heavy drinkers at 28 percent. This style of heavy drinking is typically associated with business entertainment and after work socializing (68). Among Asian and Pacific Island American women, four-fifths of Korean and Filipino women were reported to be abstainers, as were two-thirds of Chinese women, and one-third of Japanese women. Among women who drank, the percentage who did so heavily varied: 12 percent for Japanese women; less than 4 percent for Filipino women; and virtually none for Chinese and Korean women (68). A similar statistic for white women showed 14.5 percent reported drinking heavily (73). Evidence suggests, however, that the prevalence of drinking may be on the rise among both men and women Asian and Pacific Island Americans, although the exact reasons for this remain unclear. Some researchers have suggested that paralleling other immigrant populations, the more acculturated and assimilated generations will tend to adopt the drinking patterns of the dominant culture. Yet other researchers point to the fact that a significant number of second and third generation Asian and Pacific Island Americans have not adopted a more copious style of drinking.

For adolescent Asian Americans, the majority of the studies mirrors the findings for the adults—this group consistently has the lowest prevalence of alcohol and other drug use for all racial and ethnic groups with the possible exception of black youth. Although, a prospective study conducted in North Carolina found an alarming increase in reported alcohol and other drug use among Asian Americans over a three-year period in the late 1980s. The reason for this increase at a time when prevalence rates for other races and ethnicities was decreasing remains unknown (72). Another study on youth in California reported that Chinese American youth used quaaludes twice as often as white and Hispanic youth, and five times as often as black youth **(68).** Drinking statistics for Asian American youth are again similar to those re-

ported by the adult population, that is, their overall prevalence rate is one of the lowest, but statistics for heavy drinking are similar to those found among white youth (72).

Psychosocial/cultural antecedents

Why does this population have such low overall rates of alcohol and other drug use? The diversity present within the Asian and Pacific Island American group makes it impossible to list all the different cultural factors that could influence alcohol and drug use patterns. However, among many of the subpopulations, anthropologists and substance abuse experts have found the existence of the following philosophies: moderation, family reputation, humility, keeping a low profile, negative community sanctions on excessive drinking and behavior, and the impact of parental drinking practices (83). Among Chinese specifically, alcohol is in an important part of many religious and celebratory ceremonies, yet excessive use is strongly discouraged.

One study in California uncovered additional behavioral factors that influenced drinking patterns among some Asian American men. Japanese respondents were heavily influenced by their friends' drinking; among Chinese men, those with more education were more likely to drink; and Korean men were strongly influenced by their parents' drinking habits (68).

Few researchers have examined psychosocial influences on Asian and Pacific Island American adolescent drinking or other drug use. One factor which has been mentioned, though, is the pressure Asian American youth, in particular, are under to succeed, especially academical y. Thirty-four percent of Asian Americans are college educated, more than twice that of the United States population as a whole. Those with the least amount of college education were American Indians (7.7 percent) and Pacific Islanders (9.3 percent). Asian parents are similar to parents, in general, in their hopes for their children's success. However, among some subpopulations (notably Japanese, Korean, and Chinese) the feelings for their children are often tied to the child's academic achievement. When their children perform poorly in school, some parents respond with strong criticism, disapproval, and shame. This can understandably add a substantial amount of stress to an adolescent who may already be coping with language and cultural differences (72).

Prevention programs

Mainstream culture in the United States, to a great degree, emphasizes individuality, competitiveness, and monetary success. Conversely, for many Asian and Pacific Island Americans the qualities most stressed are the needs of the family, sharing and generosity, and a belief in *who you are* rather than *what you own.* Because the extended family is so important in many of the cultures, it is often the first group that an individual with problems will turn to versus an "outsider" or social service agency. Substance abuse prevention practitioners need to be aware of the strong resistance within many Asian and Pacific Island Americans to seek outside assistance.

One innovative substance abuse program entitled Na Keiki O Ka'Aina (Children of the Land) is being implemented in Oahu, Hawaii. Children attending the local Makaha elementary school work several hours a week on a farm where they learn to care for the land, their environment, and themselves as alternatives to lifestyles that rely on alcohol and other drugs. The program uses the cultural values of native Hawaiians, which emphasize "warm, open friendship and love," love of the earth, and other spiritual values. Since the program's inception, class behavior has noticeably improved, English scores have increased, and a survey measuring drug use in the district schools showed that Makaha school was the only school that reported a decrease (74).

Areas for Future Research Among Different Racial and Ethnic Groups

While this section of the report has reiterated the need to view racial and ethnic groups as heterogeneous, the majority of substance abuse data is not collected or examined in this way. To date, a variety of distinct cultures are usually grouped under

one classification, and generalizations are made concerning this group's drug use. While substance abuse prevention programs are often better tailored to specific subpopulations and cultures, it is virtually impossible to adequately evaluate these programs when little baseline substance abuse data exists for specific subpopulations. There is therefore room for improvement in the collection of prevalence data on alcohol and other drug use and abuse among distinct racial and ethnic groups. Furthermore, long-term prospective studies, which are essential for understanding risk and protective factors specific to different groups, are extremely scarce.

Biomedical research on different racial and ethnic groups has also been inconclusive and scanty (with the possible exception of alcohol research and Asians).

ECONOMICS

Economics can be viewed as a factor in individual substance abuse in two ways. In areas where substance abuse is already well established and viable employment opportunities are scarce, selling illicit substances can seem very appealing. Several questions arise from this scenario. Are individuals lured into the world of illegal drug sales by income potential? And, are drug dealers more 1ikely to become drug abusers because they are dealers? Both of these questions have been addressed under the first section.

A parallel issue is that of poverty and the daily stresses encountered by individuals living in chronically poor areas. Do individuals living in these poor areas abuse substances in greater numbers or are fewer social services available in these areas, and thus the consequences from substance abuse are more acutely felt and visible?

Generated Income

While few studies have attempted to **ascertain the** individual incomes of drug dealers, two studies have concentrated on the street sale of illicit drugs by urban youth (2 1,52). The research revealed that individual dealers reported mean gross monthly incomes of $3,558 to $5,934. Even if these self-reported earnings were exaggerated, this sum of money is clearly more than many urban youth could hope to obtain in legitimate jobs at a median of $7 per hour.

This earning potential may be a serious obstacle to prevention, intervention, and treatment programs targeted toward urban adolescents. The staff at an innovative treatment program for drug dealers in Baltimore, Maryland, has discovered the difficulties former dealers have in giving up the fast lifestyles they once led.

> Most dealers say they do it because of the money," says a staff counselor. "They can't see working at McDonald's for minimum wage when they're making $500 to $1,000 per day," he adds. Counselors try to help clients think beyond the idea of making fast money to the moral, social and legal issues associated with drug dealing. They find, however, that the moral issue is not always clear-cut. In many cases, clients are supporting their families and it is hard for them to see they are doing something wrong when they are paying the bills.
>
> Overall, counselors say their clients are addicted to the money. "What we do is help them see what is all around them, what they're doing to themselves and their community by selling drugs (48).

The potential for monetary gain may be especially true within the crack trade. A young black male from San Francisco, California, explained his preference for the immediate rewards of selling crack over the seemingly meaningless rituals of school:

> Forget about school. I'd rather have a life of selling drugs. . . When you go to school, you do nothing. You sit around, have books in your backpack, take 'em home, do your homework, come back to school, get some grade. When you sell drugs, see, I had satisfaction of seeing my work, getting some money for it (22).

It would appear then that for many urban youth, selling illicit drugs supplies purpose, companionship, and income without compromising dignity. More money can be gained from the sale of illicit drugs than through petty crimes, and certainly more than through minimum wage jobs.

Another issue to be addressed is the dealer-turned-client. From the two previously cited studies, dealers were estimated to spend between 59 and 71 percent of their income each month on the purchase of illicit drugs. For example, out of $3,558 gross per month, $1,226 was spent purchasing additional drugs for business, $883 was spent on drugs for personal consumption, and an additional $533 on expenses associated with drug dealing.

The Urban Institute has also reviewed the relationship between using and selling drugs. Its study population was composed of 387 inner-city adolescent males of ninth- and tenth- grade age. Of this sample, 79.6 percent reported that they neither used nor sold drugs within the past year. Of the remainder, 19.0 percent reported both using and selling drugs, 44.3 percent reported selling only, and 36.7 percent reported using only. They also discovered that the greater the level of involvement in either using or selling, the higher the likelihood of doing both (13).

In summary, the research completed thus far neither confirms nor negates the possible influence income potential has on luring individuals into drug dealing. Nor can one conclude that drug dealers are more likely to become substance abusers than nondealers.

Poverty

Alcohol and drug problems are present not only among the poor, but are poor individuals at greater risk for developing these problems? While a relatively straight forward question, not only is poverty difficult to define, but drawing conclusions concerning an individual's potential for future substance abuse based on one or two variables, such as family income or educational level, is overly simplistic and deceptive. To adequately review this question, a milieu of both individual and aggregate measures should be present in any analysis done.

In recent years, great attention has been paid to the plight of the urban poor, many of whom are minorities. These inner-city communities are often riddled with high rates of crime, violence, unemployment, and inadequate social and medical services. For individuals living in these localities, the consequences of these problems are serious and far-reaching. Yet according to the 1980 census only 9 percent of *all* the poor, and 21 percent of all the poor blacks, lived in these types of areas.

> To define the problems of the urban poor as predominantly "black problems" does a disservice to the two-thirds of African Americans who are not poor, as well as to the two-thirds of the poor in our central cities who are not black (8).

Poverty within rural communities, while lacking much of the violence and crime of urban areas, is no less oppressive. In 1987, compared with the general population, rural residents were less likely to be employed and to have completed high school. They had lower average incomes and higher poverty rates than did urban residents, and one out of every six rural families lived in poverty (compared with one in eight urban families). This ratio approached one out of two for black rural families. Areas of chronic poverty were concentrated in the South, where 25 million of the Nation's 57 million rural residents live (48 percent), and where four out of every ten rural residents were poor, elderly, or both (61).

To assess poverty and its relationship to alcohol and drug abuse problems, one must find appropriate measures. Some researchers have utilized the Federal guidelines for poverty, while others employ measures of Socioeconomic Status (SES), such as educational level and household income. To date, the largest and most comprehensive analysis of SES variables and substance use has been accomplished by NIDA (76). Both bivariate and multivariate analyses were completed on data collected in 1988 and 1990 from NHSDA (see box 6-C).

The NIDA report has two major limitations. First, the analysis focused on indicators of drug and alcohol ***use,*** rather than indicators of problem use or hard-core use. While the report has categories *for frequent/heavy use* and ***recent use,*** it cannot be assumed that individuals who reported such use had alcohol or drug *problems.* Secondly, the

report lacks data for transient, homeless, or institutionalized individuals, many of whom have serious alcohol and/or drug problems.

Table 6-3 presents the findings from the multivariate analysis of the NHSDA data. The SES variables pertinent to a possible link between poverty and substance use are educational level, occupation of chief wage earner, employment status, number of jobs held in past 5 years, median housing value, and percent of housing that is owned. Neither personal income nor household income were included in the analysis, as personal income was most meaningful only for persons who worked and household income data were not available in the 1988 survey.

Alcohol consumption within the past month was measured on three levels: abstinence; non-heavy use; and heavy use. Marijuana use was measured by any past-month use and cocaine use was measured by any past-year use (both categories could include frequent as well as casual users). Major findings from the analysis include:

- SES variables associated with poverty and predictive of **past month abstinence** from alcohol were: not having worked in the past 5 years and having lived in a census block with a high percentage of owner occupancy. For users, versus abstainers, SES attributes predictive of **non-heavy alcohol use** included having attended college (regardless of completion) and living in census areas with high housing values. Significant for **heavy alcohol use** was not having completed high school, holding three or more jobs in the past 5 years, and living in a census area with low housing values. No employment status or occupational categories were found to be independently predictive of heavy alcohol use.
- For any **past-month marijuana use** the independent SES predictors associated with poverty were being unemployed and having held three or more jobs in the past 5 years. Individuals who reported **no marijuana use** in the past month were more likely to have had some degree of college participation.
- Many of the SES predictors for **cocaine use in the past year** were similar to those identified for marijuana use: being unemployed and having worked three or more jobs in the past 5 years. SES characteristics predictive of **no reported cocaine use** in the past year were being a college graduate and having a part-time job.

This type of analysis is an exercise in inclusion and exclusion. A myriad of individual and aggregate characteristics are initially considered in the equation and, depending on the outcome of interest, whether it be heavy alcohol use or marijuana use in the past month, different variables will show themselves to be either predictive or not predictive of the outcome. Because personal income and household income were not included in the multivariate analysis, but are often used as SES measures for poverty, tables 6-4 and 6-5 depict the bivariate analysis done by NIDA (76). Again, this analysis reveals *associations,* not causality.

Personal income (which is highly correlated with an individual's age and sex) was examined only for respondents who reported working full time during the year prior to the survey. Associations between personal income and drug use were significant for most drugs. For every drug use measure (except past-month use of alcohol), plus heavy use of alcohol, the percentage of users declined as the income level rose. Differences between income levels for frequent use of marijuana and cocaine, concurrent heavy use of alcohol with marijuana, and use of psychotherapeutics, hallucinogens, inhalants, and crack were all statistically significant and more than twice as common in the lowest income group as in the highest. Low income was also associated with higher rates of abstinence from alcohol as well as higher rates of heavy drinking.

The associations between household income (which is less affected by age and sex) and drug and alcohol use were considerably weaker than those observed for personal income. The only statistically significant associations were for alcohol use, concurrent heavy alcohol use with marijuana, and use of hallucinogens. Those with household

TABLE 6-4: Percentage of Full-Time Employed Adults Reporting Use of Alcohol and Illicit Drugs, by Personal Income: 1988/1990

Drug use category (Number of respondents)	Personal income <$9,000 (996)	$9,000-$29,999 (4,172)	$30,000+ (1,564)	Significance
	Percentage of users and nonusers			
Alcohol				
No use in past month	*43.4*	*38.7*	*27.9*	**s**
Use in past month[a]	*49.0*	*54.5*	*66.8*	
Heavy use[b]	*7.7*	*6.8*	*5.3*	
Marijuana				
No use in past month	**90.4**	**93.0**	**96.3**	
Use in past month[a]	**4.9**	4.1	**2,0**	
Frequent use[c]	*4.7*	**3.0**	**1.7**	
Cocaine				
No use in past year	*93.6*	*94.7*	*96.6*	
Use in past year[a]	*4,4*	*3.7*	*2.7*	
Frequent use[a]	*2,0*	1.6	**0.7**	
	Percentage of users			
Multiple use[e]				
Alcohol/marijuana	**3.4**	**2.8**	1.1	**s**
Alcohol/cocaine	1.8	1.4	*1.2*	NS
Alcohol/psychotherapeutic	**2.0**	*1.0*	**0.9**	NS
Other drugs in past year				
Psychotherapeutics	**9.1**	5.1	4.8	**s**
Hallucinogens	**3.8**	1.5	**0.4**	**s**
Inhalants	**3.9**	1.1	**0.7**	**s**
Crack (in lifetime)	**2.0**	**2.0**	**1,0**	**s**
Heroin (in lifetime)	**2,2**	**1.1**	**0.8**	NS

NS = Not significant
S = Significant at p< .05 or less
[a] Excluding heavy use (alcohol) or frequent use (marijuana and cocaine)
[b] Defined as having five or more drinks on five or more days in past month
[c] Defined as using marijuana five or more times in past month
[d] Defined as using cocaine once in a month or more often in past year
[e] Heavy use of alcohol in past month and any use of marijuana (past month) or heavy use of alcohol in past month plus cocaine/psychotherapeutics (past year)

SOURCE National Institute on Drug Abuse, National Household Survey on Drug Abuse, 1988 and 1990

incomes of $40,000 or higher were about twice as likely as those with incomes of less than $12,000 to have used any amount of alcohol in the past month. However, the rates of heavy drinking differed little across the income levels. Other categories of drug use appear to be slightly less common among the wealthiest households, but, in general, drug use was not strongly related to household income.

From these types of analyses, a straightforward "yes or no" response to the initial question, which linked poverty to increased individual risk for

TABLE 6-5: Percentage of Adults Reporting Use of Alcohol and Illicit Drugs, by Household Income: 1990

Drug use category (Number of respondents)	Household income <$12,000 (1,236)	$12,000-$39,999 (3,454)	$40,000+ (2,392)	Significance
	Percentage of users and nonusers			
Alcohol				
No use in past month	64.1	*48.5*	**34.6**	S
Use in past month[a]	30.8	*45.7*	**607**	
Heavy use[b]	5.1	*5.8*	**4,7**	
Marijuana				
No use in past month	*933*	*94.9*	*95.7*	NS
Use in past month[a]	*41*	**3.0**	*2.2*	
Frequent use[c]	*2 6*	**2.1**	*2.1*	
Cocaine				
No use in past year	**96.2**	**97.0**	*96.9*	NS
Use in past year[a]	**25**	**2.1**	**2.0**	
Frequent use[d]	**1.3**	**0.9**	**1,1**	
	Percentage of users			
Multiple use[e]				
Alcohol/marijuana	*2.3*	*2.3*	*1.2*	S
Alcohol/cocaine	**1.0**	**1.0**	**0.9**	NS
Alcohol/psychotherapeutic	*0.8*	**0.7**	**0.8**	NS
Other drugs in past year				
Psychotherapeutics	*3.7*	*4.2*	**3.7**	NS
Hallucinogens	**1.0**	1.3	**0.6**	S
Inhalants	*0.8*	**1.0**	**0.7**	NS
Crack (in lifetime)	1.6	**1.5**	**1.2**	NS
Heroin (in lifetime)	**1.0**	**0.8**	**0.8**	NS

NS = Not significant
S = Significant at p<.05 or less
[a] Excluding heavy use (alcohol) or frequent use (marijuana and cocaine)
b Defined as having five or more drinks on five or more days in past month
[c] Defined as using marijuana five or more times in past month
d Defined as using cocaine once in a month or more often in past year
e Heavy use of alcohol in past month and any use of marijuana (past month) or heavy use of alcohol in past month plus cocaine/psychotherapeutics (past year)

SOURCE National Institute on Drug Abuse, National Household Survey on Drug Abuse, 1990

drug abuse, is clearly impossible. The NIDA analyses demonstrated that the type and quantity of an individual substance use is correlated with a variety of both individual as well as geographic characteristics. Furthermore, while the NIDA report was the largest and most comprehensive to date, some segments of the population, many of whom were possible alcohol and drug abusers, were excluded from the survey.

As one economist noted, "There is much we still need to learn about poverty. Much of the past research has focused primarily on economic questions, reflecting the extensive involvement by economists in this work. Research is much more

limited on topics such as the causes of changing family structures, the impacts of neighborhoods and family structure on children's opportunities in life, personal and family coping strategies among the poor, how expectations about future opportunities are formed, and how these expectations influence behavior" (8).

PSYCHOSOCIAI/BEHAVIORAL

Aggressiveness

In much of the research literature the term aggression is used almost exclusively when referring to young children and adolescents between the ages of 13 and 15. Shortly after this age a divergence appears within this identified aggressive group. The vast majority of children "outgrow" their aggressive behavior, while a smaller percentage progress into or also exhibit, among other things, conduct disorders, antisocial behavior, delinquency, and violence. Discussing each of these areas is beyond the scope of this report. However, it should be noted that as is true for many individual risk factors, a number of these behaviors are intricately meshed.

Definitions for the term aggression vary considerably and may include tardiness, breaking rules, fighting, vandalism, cruelty to animals, and verbal abuse of other children. Many studies simply fail to define it. Wherever possible, study definitions of aggression will be outlined.

The children in the various studies on aggressiveness and subsequent drug abuse ranged in age from 5 to 20 years old. Aggressive behavior in the majority of the studies was exhibited almost exclusively by boys. While girls were included in the study populations, the number exhibiting aggressive behavior was very small. However, the presence of aggressive behavior among some young girls has not been shown to be predictive of later adolescent delinquency or substance use (49). This disparity between the sexes has not been addressed at any length.

Of the preadolescent boys who exhibited aggressive behavior, 30 to 40 percent maintained this behavior into adolescence. This continued aggression has been shown to be a strong predictor of subsequent alcohol and drug problems (28,33, 51). Interestingly, the combination of shy and aggressive behavior has also been correlated with later substance use problems. It has been postulated that aggressive boys may be more likely to be shunned by conventional peer groups, but accepted by other aggressive children who could encourage drug and alcohol use. Another theory, while not confirmed, suggests that young children rejected by conventional peer groups gravitate toward each other and that these groups of former so-called loners may foster delinquent behavior in later adolescence (28). Conversely, boys (but not girls) exhibiting shy behavior have been shown as less likely to partake in alcohol and drug using activities as they grew older (28,33,51).

Where does this aggressive behavior originate? Some studies have shown that young children exhibiting sociable, spontaneous, and fearless behavior are at greater risk for future aggressive and violent conduct. Factors that seem to be protective include a shy temperament, being first born, having a small and stable family characterized by low discord (i.e., effective family management), and having parents who regularly attend religious services (51).

> Current psychological perspectives emphasize that aggressive and violent behaviors are "learned" responses to frustration, that they can also be learned as instruments for achieving goals, and that the learning occurs by observing models of such behavior. Such models may be observed in the family, among peers, elsewhere in the neighborhood, and through the mass media (51).

This observation could, in part, explain why so few young girls are identified as aggressive. While socially defined roles for adults have changed considerably in the last several decades, the socialization of children's behavior to a large extent has not. Certain behaviors by boys are still classified by many adults under the "boys-will-be-boys" axiom, while the same behaviors by girls are often considered inappropriate.

Biological and genetic precursors to aggressiveness have also been explored. Events

associated with brain dysfunction that appear to increase an individual's potential for aggression include: brain injuries; in vitro exposure to opiates, cocaine, alcohol, and tobacco; and early environmental exposure to lead (e.g., air contaminated by leaded fuels, lead-based paint, water from older plumbing systems) (51).

No genetic studies specific to aggressive behavior have been conducted. Several Scandinavian countries have researched the association between genetics and violence, obtaining mixed results. No such studies have been attempted in the United States (51).

By understanding the antecedents of aggressive behavior, prevention programs targeted at reducing such behavior are much more likely to succeed. It has been asserted that multidimensional programs are more effective than those that focus on one or two components of aggressiveness. Researcher Karen Dodge submits:

> Most intervention approaches are implemented without regard for the type of aggressive behavior under scrutiny, and that different types of aggression are likely to respond differently to different types of intervention. Reactive aggressive children who overly attribute hostility to others in provocative situations may respond best to treatment aimed at training them to understand better others' thoughts and feelings. Proactively aggressive children may respond more favorably to consistent punishment of aggressive behavior and reinforcement of nonaggressive responses; this latter group many also have a better prognosis than the former group. Three intervention programs cited as being particularly suitable for differential implementation with these two types of aggressive children include social problem-solving skills training, anger-control training, and parent training (17).

Several unanswered questions point to areas for future research. Why do boys disproportionately exhibit aggressive behavior? Are specific aggressive behaviors unique to certain subpopulations? What are the differences between those individuals who "grow out of' their aggressive behavior and those who do not?

Answers to these questions and others will allow for more detailed understanding of aggressive behavior and its connection to alcohol and drug abuse, which could in turn provide for an improved structure for the planning of appropriate prevention programs.

Delinquency and Crime

Similar to aggression research, studies define and collect data on delinquency and crime different y. Some studies use the two terms interchangeably, while others define delinquent acts as those less serious versus acts such as rape, armed robbery, and manslaughter, which are clearly illegal. Self-reported data are relied on by some studies, while others utilize only arrest records. These differences must be considered when attempting to generalize delinquent behavior to subsequent misuse of alcohol and drugs.

As is true for aggressiveness, males are at greater risk for developing delinquent and criminal behavior. Delinquent behavior for most youths appears to peak between the ages of 15 to 17, while alcohol and drug use are on the rise. However, only a small percentage (2 to 6 percent) of these adolescents become young adults who continue to engage in serious criminal activity coupled with frequent drug use. Statistics reveal that many arrests for property and violent crimes can be attributed to this small group of individuals **(29).**

Several researchers have linked delinquent and criminal behavior to alcohol and drug abuse and have concluded these activities precede the use and abuse of certain substances (28,29,13,56).

One such study conducted on adolescents examined the relationship between later drug use and earlier individual delinquent behavior and delinquent peer group bonding (DPGB). Females were found less likely to engage in individual delinquent behavior before but not after participating in a delinquent peer group. Additionally, minority students doing well in school had lower rates of delinquent problems than did nonminority youth who were also doing well in school. Strong positive belief systems (beliefs that committing il-

legal or rule-violating acts are morally wrong) also decreased the potential for future use of alcohol, marijuana, and other drugs. Conversely, those adolescents who had high DPGB levels had increased rates of alcohol, marijuana, and polydrug use (20).

A separate study of male and female cocaine addicts analyzed the psychosocial factors present among individuals who substantially increased their cocaine use from adolescence to young adulthood. Those who progressed to heavier use displayed a significant lack of law abidance or social conformity (46).

Several points have come to light from studies on heroin addicts. Studies conducted in the late 1970s found that while delinquency preceded illicit drug use, use of alcohol and first alcohol intoxication took place *before* delinquency. In fact, an average of two years lapsed between first alcohol intoxication and first criminal activity for both males and females who later became heroin addicts (64). A further study on male heroin addicts that grouped participants into low-crime versus high-crime categories found that men who had been placed in the high-crime group admitted significantly more contact with the criminal justice system before becoming addicted than did those in the low-crime group. Also, the high-crime group showed earlier and more frequent use of substances, as well as use of a wider variety of narcotic and nonnarcotic substances (47).

While a relatively small number of individuals who exhibit delinquent behavior progress to serious alcohol and drug problems, understanding the cause(s) of the delinquent behavior may help to decrease this number further. Psychosocial elements that have been associated with later delinquent behavior include:

- low parent-child attachment
- family conflict
- family social deprivation
- school failure
- parental and sibling drug use and criminal behavior
- poor and inconsistent family management practices (e.g., harsh or lax discipline, lack of supervision)
- attitudes and beliefs
- lack of neighborhood attachment and community disorganization
- family mobility.

Neurophysiological and cognitive dimensions have also been examined for serious delinquents, adult criminals, and children with conduct disorders. However, the findings were scanty and inconclusive (29,37).

When discussing prevention programs for these children, there is the hazard of labeling them predelinquent. This concern could be applied equally to most risk factors linked to future alcohol and drug problems. Labeling children as aggressive, high risk, delinquent, or developmentally slow may be a self-fulfilling prophecy. Some researchers have suggested that broad, encompassing programs should be implemented in targeted areas where groups exhibit a number of the risk factors previously described. This type of approach would not single out individuals but rather would assist communities, schools, and families (29).

Physical and Sexual Abuse

Researchers and clinicians have increasingly addressed the possibility that physical and sexual abuse, especially in childhood, may be associated with an increased likelihood of later substance abuse and addiction. Although there are many gaps in this literature, and substantive and methodological issues that remain to be addressed, findings from several studies that have measured the prevalence of substance abuse strongly suggest that additional research and the evaluation of targeted clinical interventions are warranted. This section highlights selected research findings on the relationship of physical and sexual abuse to later substance abuse.

One review article on physical abuse found that children subjected to physical abuse had higher

levels of later substance abuse compared to children not physically victimized. The review also cited another study which found that 84 percent of the females in treatment for alcohol or drug addiction reported a history of childhood abuse (1 8).

Childhood sexual abuse appears to be rising. The National Incidence Study reported in 1988 that approximately 156,000 children had been recognized by public agencies (such as child protective service agencies, mental health agencies, and the schools) as being sexually abused each year, for an annual rate of about 0.3 percent (58). This is an increase in recognized cases of child sexual abuse of more than 300 percent between 1980 and 1988, and due to the sensitive nature of the topic, is probably a gross underestimation of the actual numbers of cases.

Prevalence statistics on childhood sexual assault specific to women range from 6 to 62 percent, depending on the definitions, methodology, and study populations used (54). One study that relied on a random sampling method discovered that of the 391 women who agreed to participate in the study, almost 34 percent reported being sexually assaulted by age 18, which provides a lifetime prevalence rate of one out of every three women. Of the respondents, over 24 percent reported an experience such as rape, 15 percent had been victims of molestation, and 10 percent reported some type of noncontact sexual assault (e.g., voyeurism, verbal threats of sexual assault, being forced to watch pornography) (54). Other researchers, measuring childhood molestation histories among women psychiatric outpatients, have cited figures of 50 to 70 percent, versus 20 to 30 percent reported by women in nonclinical populations (12).

While causality has not been established between childhood sexual abuse and later substance abuse problems, an association between the two variables has been shown. Several review articles have summarized the findings from researchers who consistently report that children exposed to sexual abuse present with a greater number of symptoms and problems compared to children who are not victimized (12,34,55). While substance abuse problems are not measured in all the studies, where it is measured, individuals who have been sexually abused show a much higher incidence of later substance abuse than their study counterparts (55). For example, 60 to 80 percent of individuals in substance abuse treatment programs report having been sexual abused (12), Other researchers have classified common symptoms by age group, discovering that among adolescents who had been sexually abused at some time in their lives, 53 percent reported abusing some substance (34).

Studies on sexually abused women have demonstrated similarly high rates. One study of women requesting appointments at a crisis counseling unit of a community health center found that 44 percent of the women walk-in clients reported a history of sexual abuse as children. The sexually abused women differed from the nonabused women in many ways, but they differed most in their substance abuse. The abused women were about 10 times more likely than the nonabused women in this population to report a history of drug abuse (21.1 percent vs. 2.3 percent) and more than twice as likely to report a history of alcoholism (26.9 percent vs. 10.5 percent) (11).

A review of four separate studies on women seeking treatment for alcoholism shows 34 to 85 percent of the women report a history of sexual abuse (30); and among recovering chemically dependent women, the topics discussed most often are sexual child abuse, incest, and rape. Uncovering the memories of these early childhood experiences is thought to be a contributing factor in drug relapse for some women (31). Thus, early experiences of abuse, especially sexual abuse, may require attention in treatment programs, since they may have been important precursors and contributors to the substance abuse and addiction, and may be major obstacles to successful treatment and the prevention of relapse.

Clearly, physical and sexual abuse are not uncommon phenomena. While this section has focused on the association between abusive experiences and subsequent substance abuse, there are many other psychopathologies that also arise from sexual and physical abuse. The research question need not be whether physical and sexual abuse

"cause" the later substance abuse and addiction. Clearly, many factors interact, especially in the home, school, and peer settings of children as they grow up. However, the consistent finding of higher levels of physical and sexual abuse among substance abusers warrants further research to disentangle the many factors that are at work. Unlike race, ethnicity, and poverty (which are not by themselves strongly and independently associated with substance abuse and addiction, but must be understood in the context of subcultures and the availability and marketing of drugs in neighborhoods and communities), physical and sexual abuse may more directly contribute to later behavioral problems, including substance abuse.

Mental Disorders

The sheer number of Americans with mental disorders transforms personal tragedy into a widespread public health problem. Nearly one in three American adults will experience a mental disorder during his or her lifetime. Moreover, approximately 1.7 to 2.4 million Americans currently suffer from a persistent and severely disabling mental disorder, such as schizophrenia or bipolar disorder (commonly known as manic depression) (62).

There exists a wide array of behaviors classified as symptomatic of mental disorders, ranging from premenstrual syndrome, hostility toward others, and other maladaptive personality traits, to full-blown psychosis (2). It can at times be difficult to delineate where mental health ends and mental illness begins.

While many alcohol and drug problems may not be attributable primarily to mental disorders, they can certainly be exacerbated by these disorders. One comprehensive study found a high prevalence of comorbid (i.e., occurring at the same time) mental disorders and alcohol or other drug disorders—including both abuse and dependence syndromes as defined in the DSM-III-R. Using data from NIMH's Epidemiologic Catchment Area (ECA) survey of 20,291 adults (aged 18 and older) in communities and in various institutional settings (prisons, mental hospitals, nursing homes, and specialized treatment centers), they assessed the prevalence of comorbid alcohol, other drug, and mental disorders. Schizophrenia, mood disorders, and anxiety disorders were among those studied. Specific drugs studied, in addition to alcohol, included marijuana, cocaine, opiates, barbiturates, amphetamines, and hallucinogens (50).

Alcohol Disorder as the Primary Diagnosis

An estimated 13.5 percent of all adults in the United States will have a lifetime diagnosis of alcohol abuse or dependence (see figure 6-3). For these individuals, the rate of mental disorder was almost double that of persons with no history of an alcohol disorder, and the rate of another drug disorder was almost six times greater. Specific comorbid mental disorders found in people with alcohol abuse-dependence disorder include anxiety disorders (19.4 percent), mood disorders (13.4 percent), and schizophrenia (3.8 percent).

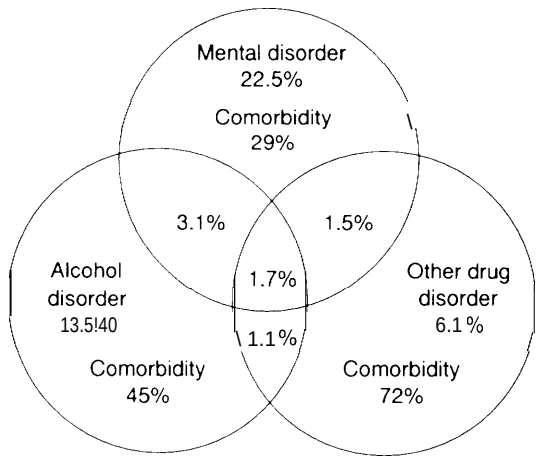
Drug Disorder *(Other than Alcohol) as the Primary Diagnosis*

Some 6.1 percent of the total adult population will have had a primary diagnosis of drug abuse or dependency at some time in their lives. Over half of these individuals have also been diagnosed with a comorbid mental disorder such as anxiety disorder (28.3 percent), mood disorder (26.4 percent), or schizophrenia (6.8 percent). Compared to those persons without a drug disorder, these individuals are at more than four times the risk of having some type of mental disorder. Additionally, these individuals are also seven times more likely to be addicted to alcohol.

Mental Disorder as the Primary Diagnosis

In contrast, at some time in their lives nearly one-quarter of all adults in the United States will have had a primary diagnosis of mental disorder. Compared with individuals having no history of mental disorder, people with a mental disorder face twice the odds of having alcohol abuse-dependence and over four times the odds of drug abuse dependence.

FIGURE 6-3: Substance Abuse and Mental Disorders



Epidemiological data suggest that there is a high degree of comorbidity for mental and addictive disorders in the United States For example, 29 percent of individuals with a mental disorder will also have an addictive disorder

SOURCE D A Regier, M E Farmer, D S Rae, et al, "Comorbidityof Mental Disorders With Alcohol and Other Drug Abuse Results From the Epidemiologic Catchment Area (ECA) Study *Journal of the American Medlca/Association 264 2511-2518* 1990

Comorbid alcohol and other drug abuse or dependence disorders occur frequently in people with the specific subtypes of mental disorders included in the study:

- Of those who develop schizophrenia and related disorders during their lifetimes (approximately 1.5 percent of the U.S. population), nearly half will abuse or be dependent on alcohol or other drugs, or both.
- Thirty-two percent of people with mood disorders (8.3 percent of the total adult population) will abuse or become dependent on alcohol, other drugs, or both.
- The anxiety disorders, as a group, occur at sometime in the lives of 14.6 percent of the population and are highly likely to be associated with an alcohol or other drug abuse or dependence disorder. For example, 35.8 percent of people with panic disorder, and 32.8 percent of people with obsessive-compulsive disorder will have some form of alcohol or other drug abuse or dependence disorder.

People with both mental disorders and alcohol or other drug disorders are likely to suffer more severe psychiatric symptoms, disruptive behaviors, aggression, and criminal behaviors. The importance of early detection for mental disorders is clear if subsequent alcohol and drug abuse problems are to be avoided. In other cases, an individual drug and/or alcohol problems may precede his or her mental disorder. In whatever order these complications are distinguished, it is essential to remember that millions of men and women suffer through not one, but two illnesses (62).

Resiliency

The majority of funding and research has been devoted to understanding and identifying those elements that appear to place individuals at a greater risk for substance abuse. However, many of these same factors can, to some degree, be protective. For example, the vast majority of adolescents who have used alcohol, cigarettes, and other drugs do *not* grow up to become substance abusing adults. The process of aging and successfully passing through various developmental stages is in itself protective. In other cases, the *lack* of a particular factor is protective. This is true for many of the psychosocial factors such as aggressivity, delinquency, mental disorders, and physical and sexual abuse.

But what about those individuals who live in stressful and chaotic conditions—who are constant] y exposed to many of these risk factors—yet who *do* ***not*** develop substance abuse problems. How do these individuals emerge relatively unscathed, while many of their immediate family succumb to substance abuse? This section addresses a complimentary set of protective attributes, characteristics identified in individuals who display resiliency to the effects of various risk factors,

The term resiliency can be described as the ability to recover from or adjust easily to misfortune or change. A 1991 conference sponsored by the Children of Alcoholics Foundation released are-

port in which resiliency was conceptualized in the following manner (15):

- Resiliency is a dynamic process, not a static condition.
- Resiliency is contextual; adaptive behavior in one context may be maladaptive in another.
- Resiliency is the result of inherent personality characteristics interacting with environmental factors.
- Resiliency is more complex in multiple-risk situations.
- Resiliency can be learned.

For the most part, social science research on resiliency in children has not specifically addressed environmental substance abuse, and where it has, the research has focused to a large extent on alcoholism within the family. However, in general, resiliency studies have examined high-risk children from a variety of families and communities, of which many had substance abuse problems.

One of the largest longitudinal studies spanned a period of 30 years and was completed by Emmy Werner on the Hawaiian island of Kauai (80,81). An entire multiracial cohort of children was followed from the prenatal period to young adulthood, revealing invaluable information on resiliency in the presence of certain risk factors. Of the 700 children originally included in the study, 200 were identified as at-risk for later problems based on perinatal stress, poverty, family instability, and parents with mental health problems. Through the children's first decade of life, approximately 25 percent had at least one parent with a serious alcohol problem. Of these children, 41 percent later developed serious learning and behavioral problems by age 18, while the rest did not. All the children of alcoholic mothers developed problems, with the exception of one. Conversely, children of alcoholic fathers "were represented in roughly equal proportions among those who did and those who did not develop serious coping problems by age 18" (80).

More general findings from the study highlighted the difference between the prevalence of serious physical, learning, and behavior problems among girls and boys. Up to age 10, when confronted with a variety of risk factors, boys were significantly more likely to display a greater number of childhood problems requiring some type of social service and/or medical intervention. However, this ratio changed markedly by the second decade (ages 10 to 18). While high-risk boys were still three times more likely than girls to have records of serious delinquency (77 vs. 26 percent), by age 18 more than twice as many high-risk girls reported serious mental health problems. Additionally, of those children in the first decade identified with serious learning and/or behavioral problems, a greater number of boys than girls had improved by age 18.

Interestingly, the researchers also showed that some of the resilience factors identified differed between the sexes. For example among young girls, experiences that tended to foster greater maturity and independence, such as absence of a father, responsibility for younger siblings, and maternal employment outside the home, also appeared to bolster resiliency and competence. On the other hand, resiliency among young boys was correlated with the presence of the father, little family discord or crowding, and the existence of adequate structure and supervision. However, overall, a greater number of high-risk girls than high-risk boys grew into resilient young adults.

Several other studies have also identified factors associated with resiliency in children (6,19,23). One such factor is described as **adaptive distancing** whereby the child accomplishes two things: the child emotionally and psychologically detaches from the chaos of the family and resumes more "customary pursuits" in the outside world of school and friends, and the child does not allow the caregiver's drug or alcohol problem to be the central focus of his or her world. These behaviors have been observed in children as young as 3 years old.

A sense of purpose and future have also been identified with resiliency. Clinicians have observed very young children attempting to make sense of their situation upon experiencing an array of hardships such as chronic poverty or familial

substance abuse. Resilient children display such attributes as hopefulness, hardiness, motivation, and a belief in a bright future even when faced with challenges and adversity.

Researchers have also found that **the ability to develop competency skills** was associated with resiliency. Competence includes "the qualities of responsiveness, flexibility, empathy and caring, communication skills, a sense of humor, and any other prosocial behavior" (6). Researchers have consistently documented the presence of these characteristics among resilient individuals, and equally important, have noted the lack of these characteristics among individuals with severe behavioral, criminal, and mental health problems.

Another element that has been associated with resiliency is the **ability to use support systems effectively. Those** children who tapped into school activities, spoke with counselors, actively sought an alternative parent figure or role model, and confided in others were much more likely to be resilient than those children not involved in these supportive networks.

Much of a person resiliency depends on a variety of elements including the individual developmental stage, cultural perceptions, and '*the acuteness or chronicity of the adverse circumstances" (19). Nonetheless, many men and women who have gone on to lead productive and fulfilling lives, often did so *in spite* of their circumstances. By understanding how this was achieved, prevention programs can incorporate activities to bolster the protective factors in the lives of all children.

Spirituality/Religiosity

The terms religiosity and spirituality are neither mutually exclusive nor inclusive. Both terms encompass an enormous array of fellowships and individual values, including institutionalized religion, new age religion or quasi-religious groups, traditional beliefs, and nonreligious persons.

Within the drug and alcohol abuse research field, studies have focused almost exclusively on the relationship between institutionalized Christian religions (with the exception of a handful of studies on Judaism) and its effect on substance use among adolescents and young adults. Virtually no data are available on other methods of worship, or discussion of the effect spiritualism/religiosity may have on the progression from adolescent alcohol and drug use to problem use and addiction.

A succinct and thorough review of recent literature on religion and substance use was completed by social psychologist Peter Benson (7). With rare exceptions, religiousness, in varying degrees, has been associated with decreased levels of substance use. The substances studied included alcohol, cigarettes, and numerous illicit drugs. This protective factor held true for men and women across the four U.S. census regions, and to some extent among blacks and Hispanics (although only a few studies analyzed race and ethnicity). The most widely used measures of religiosity were church attendance, church affiliation versus nonaffiliation, and religious importance; yet it also appeared that such indirect associations as parents' religiousness and belief in life after death were correlated with decreased substance use. Multivariate analysis was employed to examine the relative importance of religiousness by controlling for other demographic and social variables. In most instances the protective effect of religiousness was relatively small, but it did appear to be more predictive than several personal factors (e.g., self-esteem, purpose in life, locus of control) and less predictive when compared to social variables such as parental standards, peer pressure, and social tolerance. Benson puts forth several explanations for this apparent protective element, most of which center around the idea that organized religion fosters and maintains a certain set of morals and values. Depending on the religion, deviating from these norms can be somewhat tolerated or, at the other extreme, considered a profound sin.

For countless individuals, *spirituality*, while a more nebulous concept than religion, is intricately tied to emotional, psychological, and physical well-being. A practitioner of Zen (Buddhist) meditation and various New Age spiritualities stated:

> I think of health at every level: a healthy mind, a healthy spirit, as well as a healthy body. So that a person would have to have energy, alertness, enthusiasm, a love of life, a love of people, a love of themselves (43).

Many traditional cultures think of illness and disease as indicators of personal spiritual discord. For example, the American Indian Navajos strive for a state of personal wholeness, beauty, and well-being. The Blessing-way rite, composed of sacred songs and prayers, is often used to restore an individual's harmony with those around him or her, the environment, and, in a larger sense, the universe.

By ignoring different racial and ethnic religious and spiritual beliefs, their importance is minimized and/or trivialized (perhaps inadvertently) by more dominant religions. From a drug and alcohol prevention point of view, it would seem both cost-effective and relatively simple to encourage and celebrate religious and spiritual differences among individuals and communities; and acknowledge the protective benefits these factors provide for many people.

SUMMARY

No single or generic set of variables explains the harmful use of alcohol and drugs for every individual. While this chapter reviewed a number of selected individual and protective factors, this information should be viewed in a broader context. To gain a complete understanding of the complexity of the substance abuse issue, the information presented before and after this chapter must be incorporated in any argument concerning factors that in some way effect an individuals potential for substance use and abuse.

By reviewing the individual risk factors under the three broad headings of Demographics, Economics, and Psychosocial/Behavioral, certain gaps in the literature appeared. Within the demographics section, the vast majority of the research to date has focused on identifying psychological as well as social characteristics that place preadolescent and adolescent children at greater risk for the initiation and continuation of drug use. While the benefits of this type of research are obvious, the majority of data point to the fact that alcohol, tobacco, and illicit drug use are highest among those aged 18 to 25 and 26 to 34. However, few research studies have been devoted to these age groups. Also, under the demographic section there was a general paucity of data on risk factors that may be unique to racial and ethnic minority populations and to some extent women (although this continues to change).

Within the economics section, while there may be quotes in the general media of tremendous financial earnings by drug dealers, research substantiating these figures is scanty. There is also little known about whether those individuals dealing drugs are at an increased risk for becoming drug abusers.

Many of the psychosocial/behavioral factors reviewed in the chapter have been extensively studied, and their associations to alcohol and drug use documented. However, one of the sections that has fairly recently been scientifically studied is that of physical and/or sexual abuse. Those studies that have been rigorously conducted are beginning to yield data that positively links childhood abuse to later alcohol and drug problems. Future research in this area is probably warranted. Also included in the section were select studies on resiliency and/or protective factors. While research has been conducted in this area for quite some time, much of the literature is not specific to alcohol and drug use situations, but rather, encompasses a wide array of variables that place individuals at a greater risk for behavioral, developmental, and learning problems.

Part III: Activity Settings

Previous chapters in this report addressed necessary preconditions that must be present in order for substance abuse and addiction to be possible, and some of the risk and protective factors that have been identified as possibly influencing abuse and addiction.

Studying these factors in isolation does not adequately explain how substance abuse and addiction occur. Drug-seeking and drug-taking behavior occurs in neighborhoods, among peer groups. In addition to surveys that attempt to quantify the nation's drug problem, research is also being conducted in order to better explain the environmental contexts in which substance abuse and addiction occurs. Such research is useful in helping to develop antidrug programs that are comprehensive in scope and relevant to different populations.

Ethnographic Drug Studies

7

Ethnographic techniques allow researchers to study how environmental and cultural factors affect values, attitudes, and behaviors of individuals and groups. Historically, ethnography has roots in both anthropology and sociology (see box 7-1).

ETHNOGRAPHIC STUDIES OF ALCOHOL AND OTHER DRUG USE

Since the 1960s the number of drug ethnographies has grown steadily. Many of the nation's social issues were in one way or another associated with drug use: poverty, urban unrest among minorities, counter culture, failure of social programs, AIDS transmission, and urban violence. Research conducted by anthropologists and qualitative sociologists was an important part of understanding new drug-related social problems and trends. By the mid- 1970s, "street ethnography" or simply "ethnography" were the terms commonly used to describe the drug research they were conducting in the United States (60).

Alcohol

Nineteenth century and early twentieth century anthropologists conducted comprehensive community studies in nonindustrial societies in which they recorded ritual and social uses of alcohol. This extensive but generally unfocused documentation provided data for later cross-cultural analyses relating alcohol use patterns to other cultural variables.

The contribution of ethnographic studies conducted outside the United States was to provide data on the social conditioning of alcohol effects. The findings from one such study conducted in

BOX 7–1: What is Ethnography?

Ethnographic research is descriptive, subjective, analytical, and comparative. The focus on context is central to the ethnographic approach, explaining how a particular behavior, institution, or process is acted on by larger forces outside of the control of the participants. It describes how events happen and the social life of the study individuals While qualitative interviewing and other more formal methodologies are usually part of an ethnographic study, participant observation (i.e., informally interacting with participants and observing events as they naturally occur) is a hallmark of ethnographic research

Studies are subjective in that they focus on the understandings, interpretations, and world views of the participants Ethnographic accounts describe not only what occurs, but also the multiple levels of distinctions by which individuals and groups make sense of and purposively act in the world

Ethnographic studies are also analytical The observations, interviews, and documents are raw data, as forms and responses are raw data for survey statisticians. The ethnographer's analytic responsibility is to condense and order these data The analytic work can include the identification of nonobvious patterns, associations, and themes, as well as the construction of topologies, process models, or explanatory frameworks.

Finally, ethnographic research is comparative in two senses of the term First, it often explores how attitudes and behaviors are shaped by social forces in two or more contexts The contexts are at times spatial (two different cultures or subcultures), at other times temporal (the same culture or subculture at different times). Ethnographic studies are also conducted within a research tradition, so that each new project draws on the methods and findings of previous research Over time, a corpus of work develops regarding a particular cultural community (e g , Samoans, inner-city drug users) or a particular topic (e g., witchcraft, ethnic boundaries) As new work appears it is scrutinized for fit with the existing corpus Lack of fit may be attributed to differing circumstances, methodologies, theoretical concerns, or possibly to inferior research or analysis

Bolivia during 1958, alerted the alcohol research community to the existence of culturally accepted alcohol use patterns quite different from those customarily encountered in the United States. For example, "virtually all of the Camba (of eastern Bolivia) drink to the point of passing out, at least twice a month." Although the beverage they drink is stronger in alcoholic concentration than that customarily drunk by other populations, there appeared to be no major health or social problems associated with their drinking (35).

These data along with findings from research on four other societies (the Aritama of Colombia, the Ifaluk of Micronesia, the Takashima of Japan, and the town of Juxtlahuaca in Oaxaca, Mexico), support the view that the experiential effect of alcohol is socially conditioned (37). Each of these societies possessed distinct messages regarding the use of alcohol, which were clear and consistent. In contrast, individuals in modem societies are influenced by overlapping, and sometimes contradictory, social messages based on religious, ethnic, occupational, generational, regional, and class differences. Drinking habits and behaviors within the United States vary enormously.

Since the 1970s, ethnographic research on alcohol use in the United States has concentrated on specifying and explaining the variations in American drinking patterns. Some ethnographers have focused on specific subcultures defined by their problematic alcohol use (53). Other ethnographers have focused on alcohol beliefs and behaviors in ethnically, religiously, and professionally constituted subcultures-usually exploring the adaptation of culturally sanctioned drinking patterns, passed on through family and community modeling, to changing social contexts (5).

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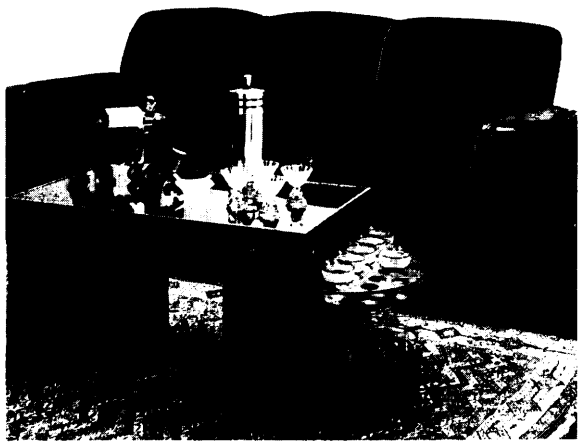

Cocktail tables, liquor cabinets, and other drinking accessories were trendy home furnishings following the repeal of Prohibition The cocktail party became an important social ritual suited to the homes and apartments many Arnericans occupied

Heroin

The majority of ethnography studies conducted in the 1960s focused on heroin use. Several of these studies challenged the accepted perception "that heroin provides an escape for the user from his psychological problems and from the responsibilities of social and personal relationships—in short, an escape from life" (47). Researchers documented drug use as a way of life, rather than just as an escape from life. Two such articles, based on three years of field work in Oakland, California, detailed several distinct patterns or styles among heroin users. Varying levels of prestige were associated with these different styles, and heroin users at the top of the hierarchy were observed to work hard to maintain their lifestyles (54,55).

Another study in New York City, New York, in the late 1960s, asked why heroin use periodically mushroomed, in epidemic proportions, in lower class communities. The data revealed that, regardless of ethnic background, in poor neighborhoods "there are pressures on adolescent boys to live up to the ideals of toughness, strength, daring, and the willingness to challenge the bleak fate of being poor." Simply put, "movement into heroin use was one route to becoming a 'somebody' in the eyes of the important people who comprised the slum social network" (20). Later articles elaborated on the idea of so-called street status. Based on 4 years of research, a hierarchy of illicit drugs was defined by perceived risk components, such as physical harm, addiction potential, parental discovery, police, and intragroup dangers. The use of drugs perceived by the group to be risky, increased a user's personal status within that group. The researcher concluded that reliance on legal sanctions and scare tactics to reduce the use of certain drugs will only make the use of these drugs appear more daring and hence to some, more attractive (21 ,23).

Cocaine and Crack

Although ethnographers noted that cocaine use was on the rise among some middle-class professionals and drug experimenters by the mid 1970s, it was not until the 1980s that extensive studies on cocaine users were begun.

While some of these early users, many of whom were white, progressed from experimental use of cocaine to heavy use with subsequent biological and behavioral problems, many others did not (57,58). Several years later, though, middle-class users with cocaine-related problems were becoming more common, prompting many would-be experimenters to steer clear of the drug. During this same time period, cocaine smuggling escalated, resulting in increased availability, lower prices, and higher quality. Within low-income, minority communities, cocaine smoking, first as free-base and then as crack, grew so precipitously that it was commonly called an epidemic. In New York City, ethnographers provided complementary perspectives on the rapidly changing crack culture.

In a series of ethno-historical articles, Ansley Hamid documented the history of cocaine smoking as it evolved in lower income minority neighborhoods in New York City. Among the elements identified as central to the widespread diffusion of crack smoking was the interest shown by heroin injectors with collapsed veins in the concentrated high of smoked cocaine; the entry of Rastafarian marijuana distributors into the cocaine trade; the

emergence of young, nonusing street distributors able to sell unit doses in vials at relatively low prices; and the rise in crack prices due to increased demand combined with suppliers who had greater control over the market. Hamid believes the rise and fall of cocaine smoking to have followed a developmental cycle similar to that of heroin use between 1964 and 1972 and marijuana use in the 1960s and 1970s (31,32,33,34).

A 1992 study of crack use focused on the children of crack users. It found that the extended family networks in the African American community, a major source of stability and support, were being overwhelmed by the drug crisis as the number of children whose mothers were no longer able to care for them because of increased drug use. Further, children exposed to drug-taking behavior by adults may be more likely to display similar behavior. In one family headed by a 60-year-old woman, an adult son was a crack dealer and a daughter was a crack-abusing prostitute (1 8).

Hallucinogens

Most ethnographic studies of hallucinogens and mind-altering drugs (e.g., peyote, mescaline, mushrooms) have focused on tribal societies. Anthropologists have uniformly found that the use of hallucinogens was socially approved and integrated into the religious and social life of the community. If one defines abuse as use of a drug in such a way that it interferes with physical, economic, or social functions, then little if any evidence points to drug abuse among tribally organized peoples (1 ,27,15,42).

Other than scattered studies of hallucinogenic drug use among hippies (12,1 4,45,46), few ethnographic studies have been completed on use of hallucinogenic substances in American society. However, the persistent use of lysergic acid diethylamide (LSD) by some young people, and concerns that its use may be increasing, have sparked new interest among ethnographers (30,38).

Marijuana

As with hallucinogens, most of the ethnographic research on marijuana use has been conducted outside the United States. Much of it was initiated in the 1960s and 1970s, when increasing use of marijuana among American youth led researchers to question the social and medical consequences of marijuana use, especially long-term use. Research was conducted in countries in which marijuana use was long standing and widespread, such as Brazil, Colombia, Costa Rica, Egypt, Jamaica, Mexico, Rwanda, and South Africa (1 1,16,17, 51).

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Poster to advertise the 1937 movie, Marijuana: Weed With Roots in Hell,

In Jamaica, for example, anthropologists Vera Rubin and Lambros Comitas directed a research team of 45 social scientists and medical professionals to conduct original ethnographic research at several field sites, in addition to medical, psychological, and psychiatric testing in hospitals and clinics. Their controversial findings were that none of the deleterious social or medical consequences believed by many to be associated with the drug in the United States could be found among Jamaican users:

> . . . There is no evidence of any causal relationship between cannabis use and mental deterioration, insanity, violence or poverty; or that widespread cannabis use in Jamaica produces an apathetic, indolent class of people. In fact, the *ganja* complex provides an adaptive mechanism by which many Jamaicans cope with limited life chances in a harsh environment (52).

Other than a few studies of middle-class users (10,39) and young African American dealers (24,25), substantial U.S. ethnographic research on marijuana use in the United States has been generally lacking, despite the fact that marijuana has been the most commonly used illicit substance for decades.

Phencyclidine (PCP)

An ethnographic study in 1979 of PCP users is frequently cited for its substantive findings and methodological contribution as the first multisite ethnographic drug study. Initiating the study when PCP use was believed to be spreading among white working-class and middle-class young people, the National Institute on Drug Abuse (NIDA) contracted for a four-city ethnographic study of PCP users not in treatment. After 3 months of working in Miami, Florida, Philadelphia, Pennsylvania, Chicago, Illinois, and Seattle, Washington, ethnographers documented groups of users and the underlying social processes. They found that it was relatively rare for a young person to use PCP exclusively. Use occurred mainly within socially distinctive groups of young people who displayed "a kind of restlessness, an orientation for action, and a sense that life generally was boring, uninteresting, and lacked recreational activities" (22).

The young people studied were very knowledgeable about drug effects and understood that the PCP drug experience varied dramatically with dosage. Low doses of the drug were reported by different user groups to be mildly euphoric and hallucinogenic like LSD, or sedating like barbiturates. What concerned regular PCP users was not the acute adverse effects reported in the media (e.g., psychotic episodes, assaultive outburst, irreparable harm), but rather "burning out"-a "spacey" state accompanied by incoherent thoughts, forgetfulness, and memory loss. As burnout became apparent, individual users and groups of users consciously cut back their PCP use. Within this group, violent episodes were found to be rare, mainly involving efforts by law enforcement or hospital treatment staff to restrain users, thereby seeming to set off panic reactions and struggle.

The study suggested that a significant gap existed between official agencies responsible for drug education and prevention and street drug users. When PCP use increased dramatically in the mid 1970s, there were no official responses because quantitative national data sources, such as surveys of high school students and hospital emergency reports, failed to include PCP as a separate drug. When the official agencies recognized the widespread use of PCP, their prevention efforts were viewed by users as distorted and were discounted. Ethnographers attribute the eventual decline in PCP use to "the general consensus among users themselves on the negative features of its long-term effects rather than the kind of expert opinion that accompanies legitimate efforts at prevention" (22).

SOCIAL CONTEXT OF DRUG USE

Specificity in Drug Abuse Research

As more questions are asked about alcohol and other drug use, it becomes clear that drug use is not one phenomenon, but many. There is no generic pattern of drug use; rather, there is use of specific drugs in specific situations.

Quantitative researchers frequently use ethnic categories to increase study specificity. While studies on different ethnic groups are useful, often the definitions of ethnicity vary and the concept is employed uncritically. Moreover, most of the quantitative researchers using the concept of ethnicity implicitly assume what anthropologists call a "static" concept of culture, viewing ethnicity as a trait one is born with, an unchanging characteristic, like hair color or body type. In contrast, most ethnographers view culture as "a dynamic process through which individuals and societies learn the

sum total of their society's behaviors and associated belief systems, including those encompassing drug use practices and beliefs" (4).

Many recent ethnographic studies focus on socially meaningful units in which members share social statuses, behaviors, and attitudes. For example, a recent book on drug use among Hispanics included ethnographic accounts of Cuban so-called streetside drug use in Miami, Florida, drug use among male and female gang members from the East Los Angeles, California, barrios, and drug use and dealing among low-income Puerto Ricans in New York City, New York, and Chicago, Illinois. (28).

Inclusiveness in Drug Abuse Research

One drawback of studying increasingly specific drug-using communities is losing sight of the larger whole. Ethnographic drug studies at times fail to link the customs of the specific study communities to customs in other communities or to place the customs in a larger framework. A way that both highlights and critiques the contribution of ethnography in the field of drug research is to focus on the social relationships around drug use, specifically, on the pattern of use in relation to self-identification with a social group. In the ethnographic literature, four basic patterns appear:

- Individuals who use drugs with others who share an identification with a lifestyle or subculture in which drug use is the central component.
- Individuals who use drugs with others who share an identification with a lifestyle or subculture in which drug use is customary and openly accepted, but not the central component.
- Individuals who use drugs with friends and acquaintances, but there is no self-identification with a drug-using lifestyle or subculture.
- Individuals who use drugs by themselves while maintaining self-identification with a group that stigmatizes drug use (see table 7-1).

Drug Use Within a Drug Subculture

Numerous studies have documented that, for pragmatic and social reasons, individuals whose lives have become oriented to a drug often associate with others who use the drug in a similar fashion. Over time a subculture develops with specialized knowledge, norms, and expectations. Individuals think of themselves as belonging to the subculture, and others define them as such. "Where subcultures exist, social-psychological barriers separate participants from onlookers" (13). It has often been noted, for example, that for many heroin users, use of the drug overrode background characteristics, such as race, class, and national origin, to become the defining characteristic. As one heroin user related:

> I always refer to myself as a junkie, even when I'm not hooked on anything. And when you're introduced to somebody for the first time the first thing you find out is whether he's a junkie or not. It's like belonging to some fantastic lodge, you know, but the initiation ceremony is a lot rougher (57).

However, even within a drug-using subculture variations exist, especially with regard to frequency and amount of use. This difference was emphasized by a 38-year-old regular heroin user from New York City:

> . , . all heroin addicts are not heroin abusers, okay? And you get the abuser, he's a dog, right? He's the one who sits in the drug house and shoots all day long. That's an abuser. I'm a visitor, you never catch me in the drug house. Not me, no (41).

A similar distinction was made by a female crack user, who, although her life revolved around crack, was still attractive, healthy, in a relationship, and the social center of a network of users. In contrast, for her:

> The crack addict is the person who's lost all sense of what going on. They are like zombies. They are out there standing in the pouring rain. If it's cold and snowing, they'll be walking up and down out there . . . . They are . . . to the

TABLE 7–1: The Social Contexts of Drug Use and Abuse

Drug use within a drug-focused subculture	Drug use as part of a larger lifestyle/identity	Drug use with "normal" partners and peers	Drug use in social isolation
Examples	Examples:	Examples:	Examples
Heroin use within the subculture of street addicts.	Marijuana and LSD use as part of student drug subcultures.	Social/recreational drug use with spouses, lovers, and friends. At home, at parties, and at social gatherings.	Physician/nurse use of nonprescribed pharmaceutical drugs
Crack use in the subculture of "pipers".	Drug use as part of artist/musician lifestyle.	Inhalant use among children.	Prescription drug abuse.
Polydrug use in the counterculture of the 1960s	Drug use as part of criminal lifestyle,	Drug experimentation among students.	Medical marijuana use by glaucoma, cancer, and AIDS patients.
	Hallucinogen use among religious seekers,		Functional drug use to increase performance.

SOURCE: Office of Technology Assessment, 1994

point of desperation where they will take off [rob] people they know. They will set you up. It comes to the point where they will setup family, friends, anybody—the point where they don't care anymore (61).

One ethnographer noted that these types of individuals were attempting "to become 'visitors' in social networks of other users, to establish a degree of contact and membership while remaining somewhat detached from the network. Their attempts to remain partially marginal to both street and straight society are a central part of their strategies for controlling their use and their own lives" (41).

Drug Use as Part of a Lifestyle or Identity

Drug use often occurs within a lifestyle or subculture in which drug use is common and accepted, but is not the defining characteristic. The subculture may be professionally oriented. For example, some of the earliest drug research was done among jazz musicians (2,62). Anabolic steroid use was common among professional and amateur athletes in certain sports (29). During its peak, cocaine use was rampant among entertainers.

In one study, a waitress at a rock-and-roll bar called cocaine use an "occupational hazard." She and other restaurant workers in the study described how groups of workers would pool funds to purchase small amounts of cocaine for use while working: "For them. . . hard work, constant activity, and long, late hours seemed instrumental to their cocaine use" (59).

Recent research has documented that at times the nuclear or extended family may act as the subcultural unit in which illicit drug use is common and accepted.

We was with my mother over her girlfriend's house when Aunt Jeannie came by and she had some coke. She cooked it up and told Ma and Ruth to try it. After that things started goin' crazier. I had to take care of my oldest sister's two sons, my son, and my younger brother. I had to do everything. Most of the time we didn't have nothin' to eat. We stayed hungry all the time. When I washed clothes I'd find vials in her [mother's] pockets.. . . I 'member comin' home one day and she'd been smokin' for awhile then, but the house was full of people smokin' all over the place. I went to go to my bedroom and close the door and it was full too. I said to her, 'what's happenin'? I just turned round and left. I was tired, the house was dirty with vials on the floor and the tables and I'd just had my son.. . . I just wanted to get away., . . At first I had smoked some crack to kill my appetite, to keep me from bein' hungry. . . I just felt like I couldn't take it no more so I took my son to my sister and left

A Philadelphia, Pennsylvania, drug house, 1991. Patrons paid an admission of a dollar or so, inside they would find drugs, clean bottle caps for smoking heroin, and bleach for disinfecting needles.

> . . . I went on a binge and smoked for three months. Nobody knew where I was, but I was out smoking crack and gettin' money anyway I could get it (18).

Drug Use With Partners and Peers

Drug use can also occur when there is no subcultural support or membership in a group that approves of drug use. In some cases, an orientation toward, or acceptance of, drug use may have been acquired earlier in life when the individual was part of a drug-accepting subculture: former hippies, student drug users, or participants in street life. Such individuals may continue their drug use long after ending their other associations with the subcultures.

Recently reported by ethnographers is the recreational use of MDMA (Ecstasy) by some middle-class individuals.

> Some professionals, particularly those whose ideas about drugs were formulated during the 1960s, quietly view psychoactive substances as one of many ways to relax, to relate, to "kick back." It is within this context, coupled with the need to relax fast and relate quickly, that Ecstasy is used (50).

Drug Use in Social Isolation

Last, some individuals use illicit drugs primarily by themselves. Often they identify themselves with a professional subculture or social group that is opposed to drug use. One well-documented pattern is that of physicians, nurses, and other health workers who illicitly use psychoactive pharmaceutical drugs, especially narcotics (63,64).

Other patterns of use in social isolation are known but poorly documented in the ethnographic literature. Unsupervised use of pharmaceutical drugs is fairly common and often the line between licitly obtained and illicitly obtained drugs can be blurred. Emergency room and family physicians, for example, encounter suspected middle-class prescription drug abusers. One middle-class housewife interviewed as part of a study of emergency room drug episodes began her use of prescription pain killers because of a back problem, and then continued chronic (and essentially unsupervised) use of the drug for years by obtaining prescriptions from multiple physicians (49).

Typology as a Whole

The ethnographic method of describing how and, to some extent, why people use drugs differs from the purely quantitative method that analyzes the association of drug use with the social and demographic characteristics of the users.

To date, most of the ethnographic research has concentrated on drug-focused subcultures or on crime-related subcultures. There are few studies on other populations, and many of these are now dated. For example, there have been no significant ethnographic studies of student drug use in almost two decades. The drug problem has been defined in the public mind and among some funding sources as a problem of poor minority communities. Some ethnographers acknowledge that, to some extent, their own attitudes have contributed to the skewing of the drug research as well. Ethnographic field work with drug-focused and crimi-

al subcultures is considered by some to be more adventurous and professionally rewarding. Also, in its own way, it may be easier than field work in the general population, since study participants can be readily delineated from onlookers and subjects can be relatively easily located on the street or through their relationship with treatment and law enforcement agencies.

One consequence of the absence of information concerning drug use within the general population is that, like a self-fulfilling prophecy, attention continues to be paid almost exclusively to minority drug use. Drug use and drug users are defined as the "other," different from the rest of society. Ethnographers have paid relatively little attention to the relationship between culturally approved drug use (e.g., caffeine, nicotine, alcohol, psychoactive prescription drugs) and illicit drug use.

Another consequence is that there are few data available on which to base prevention programs for individuals who are unlikely to become members of a drug or criminal subculture. Virtually nothing is known about experimenters, casual users, controlled users, or chronic users not associated with a drug subculture.

POVERTY, RACISM, AND CYCLE OF ABUSE

The preceding section outlined a variety of drug using contexts in the United States and documented the presence of drug use and abuse among different social, racial, and ethnic classes. Equally important, however, is the realization that the consequences of drug abuse are especially devastating in chronically y poor, often minority, communities. While poverty as an individual risk factor for substance abuse is described in chapter 6, this section considers ethnographic observations on the links between the poverty of the inner-city communities and substance abuse.

The Social Context of Poverty

Drug ethnographers have noted that urban poverty means more than lacking money. Often it means living in substandard housing in communities that lack basic municipal services, and for young people it usually means attending overcrowded, underfunded, demoralized schools. Researchers regard illicit drug use, especially the use of heroin, cocaine, and crack, as both a result of oppressive social conditions and a cause of the worsening of these conditions.

To cope with difficult social circumstances, ethnographers have documented the effective utilization of extended family networks and kin relationships. However, even with these safeguards, it is not uncommon for children to encounter alcoholism, other drug use, depression, physical abuse and neglect, sexual abuse, and other traumatic experiences.

Lack of Opportunity

In ethnographic life histories of men and women who become deeply involved with illicit drugs, the characteristic of inner-city life most often mentioned is the lack of opportunist y for meaningful work. For example, an ethnographer studying heroin addicts in the early 1970s noted:

> Often in interviews with addicts I have thought that this antiwork attitude was a sour-grapes defense because so few have had meaningful work experiences and many do not consider good-paying or creative jobs work, but I think that these attitudes are more than psychological mechanisms. They are, I believe, deeper in the fabric of our society and arise out of poverty and the reality of poor, uneducated persons who can only expect the most dull, stultifying, and meaningless work. Most, I would expect, held these attitudes before their addiction and when they became addicted simply added another good reason not to pursue something that offered so little (56).

More recently, ethnographers studying the crack subculture, have related changes in drug use patterns to structural changes in the world economy. For many inner-city residents the difficult economic situation of the 1950s and 1960s became impossible in the 1970s and 1980s, as many of the secure semiskilled and unskilled jobs shifted overseas. New York City, for example, lost a half million manufacturing jobs and 100,000 jobs in wholesale and retail trade between 1967

and 1987 (36). For individuals without post secondary degrees, jobs that could support a family became scarce.

Because of the structural shifts, basic expectations around work have changed dramatically:

> The option of a steady, legal job appears so distant for inner-city high-school dropouts (and even graduates), that they cease job searches after a few attempts or experiences in low-wage jobs. Adult household members can rarely provide concrete assistance in finding jobs or help in accessing networks of employers (19).

Racism

Clearly a person need not be a member of a racial or ethnic minority group to use drugs. Much of the early ethnographic research was done on white heroin-using individuals (20,21,48) or with mixed ethnic and racial backgrounds samples (47, 20,56). Nonetheless, many ethnographers introduce race as an explanatory element. It is not used in the genetic or biological sense but rather that racial discrimination has shaped the social context and opportunity structure for many people of color. Ethnographers cite the indirect racism of some politicians who have been unresponsive to the worsening social conditions of schools, housing, and municipal services in many minority communities. Also reported is the active racism encountered by many minority people in daily life (9,8).

Ethnographers describe inner-city minority residents as having a pervasive sense of not fitting into white mainstream society. Within most poor inner-city communities, whites are rarely encountered except as representatives of conventional institutions such as police, teachers, and social workers.

Development of an Oppositional Culture

While oppressive social conditions, limited economic opportunities, and racism are identified by ethnographers as contributing to the high prevalence of drug abuse in the inner city, in and of themselves they offer little insight into the specific attitudes and behaviors of those involved in illicit drug use. For this, ethnographers have often relied on the notion of an oppositional culture, one of resistance or refusal.

Some ethnographers argue that amidst oppression and exclusion, minorities, such as blacks, Hispanics, and American Indians, develop "a collective identity or sense of peoplehood in opposition to the social identity of white Americans." Developed in tandem with this oppositional social identity is a cultural frame of reference that defines "certain forms of behavior and certain activities or events, symbols, and meanings" as not appropriate because they are characteristic of white Americans while "other forms of behaviors and other events, symbols, and meanings [are defined] as more appropriate because they are not a part of white Americans way of life. To behave in the manner defined as falling within a white cultural frame of reference is to 'act white' and is negatively sanctioned" (26).

Many ethnographers studying inner-city communities argue that illicit drug use is embedded in an oppositional culture, formed in response to oppressive social conditions and lack of opportunity. Ethnographer Terry Williams explains:

> . . . to some extent, it is possible to see the violence, crime, and substance abuse that plague the inner city as manifestations of resistance to a society perceived as white, racist, and economically exclusive. This could be called a culture of refusal. The young people in the crackhouses refuse to be part of the system, refuse to obey their parents, reject school or any adult-controlled education or training, spurn prevailing social values and most authority. In the crackhouses, teenagers and adults refuse to obey the law, refuse to stay sober, refuse to engage in safe sexual practices--even though this refusal leads them to behaviors that are manifestly harmful both physiologically and psychologically (61).

Cycle of Abuse

Attraction of the Drug

Ethnographers have emphasized three factors to help explain the use of illicit drugs, especially heroin and crack by poor, inner-city, and minority populations.

First, ethnographers report that as the use of a drug begins to spread through a community, its use is seen as a status symbol within the street hierarchy. Many ethnographers attributed the quick expansion of cocaine smoking that occurred in the middle 1980s to cocaine's reputation as a high-status drug, especially when smoked or free based (23).

Second, initiation into drug use almost always occurred through an established friendship or kin relationship. Virtually every ethnographic study of drug use quotes users as saying: I was at a party (or with a friend) and someone offered me some heroin (cocaine, crack), so I tried it.

The third theme is simply that many people, when they try heroin or crack cocaine, like it. For some individuals, at least in the beginning, their drug experiences are more highly valued than anything else in their lives (6,61).

Several ethnographers have suggested that once crack became available at relatively low cost in the late 1980s, the sharp rise in its use was due primarily to the intensity of the drug experience, comparable in somatic effect to arterial injection. The drug's effects attracted intravenous drug users with collapsed veins or with concerns about HIV transmission, as well as many nonintravenous drug users (23,40,43).

Slide Into Abuse

In explaining the slide of inner-city residents into drug abuse, addiction, and dependency, ethnographers have highlighted two complementary themes. One theme explains the function drug dependency serves in simplifying and giving meaning to a drug user's life. Stated succinctly: "The euphoria of heroin and the excitement of hustling serve many addicts in the same way that jobs, sex, and consumption serve nonaddicts" (56).

A similar conclusion was drawn by another ethnographer studying crack use patterns:

> Substance abuse in general, and crack in particular, offer the equivalent of a millenarian metamorphosis. Instantaneously users are transformed from being unemployed, depressed high school drop-outs, despised by the world—and secretly convinced that their failure is due to their own inherent stupidity, "racial laziness" and disorganization—into being a mass of heart palpitating pleasure, followed only minutes later by a jaw-gnashing crash and wide awake alertness that provides their life with concrete purpose: get more crack—fast! (8).

The complementary perspective emphasizes the lack of a viable lifestyle alternative to drug use. One researcher contends that due to the unequal distribution of viable nonaddict social roles in society, some groups will have more difficulty in recovery than others:

> For example, a white, middle-class, high-school-educated, male addict will have more personal and social resources to draw from when he decides to give up dregs than will a Chicano addict living in a barrio. In fact, a relatively uneducated Chicano addict may opt to retain the junkie-dealer role and identity because it provides him with greater status and financial rewards than any other social role available to him (7).

End of the Cycle

Despite little improvement in the social conditions of many inner cities, recent journalistic accounts, ethnographic studies, and reports from surveillance systems indicate that the prevalence of crack use maybe decreasing. Ethnographers report that for many individuals, the initial appeal of crack use has faded. "Youths under 16 have made a new pastime of ridiculing or beating up crackheads who they say disgrace neighborhoods or are nuisances or thieves. Five years ago, youngsters their age had initiated crack use after first becoming distributors, as youngsters had previously been drawn into heroin use" (34).

Ethnographers present several possible explanations for this downturn. Epidemiologically, a parallel could be drawn to the decrease seen in bacteria-based epidemics, where all individuals most likely to be infected have been. Economically, it could be argued that all possible wealth to be extracted from the inner city has been. There are simply fewer resources for drug traffickers, smugglers, and importers.

A complementary explanation is based on concepts put forward 25 years ago (3). It was argued that the social consequences resulting from a drug's use could be related to the historical stage of the drug's introduction in society. Most importantly, over time, a subculture of drug users develops ". . . material on how to obtain and ingest the drug, definitions of the typical effects, the typical course of the experience, and the permanence of the effects.. . ." In the case of marijuana and LSD, this type of shared information may have accounted for the sharp decrease in reported psychotic reactions even though the actual number of users was increasing.

This subculture can also define certain drugs or styles of use as dangerous. For example, ethnographers argue that the downturn in cocaine use in the late 1980s among middle- and working-class individuals was due to the belief that "cocaine can mess you up," and that this subculture of users understood this warning as more than just propaganda of prevention proponents (59).

This same process may be occurring in inner-city communities among the subculture of crack users. Researchers note that the crack epidemic has followed a predictable developmental cycle, previously seen with heroin use, "characterized by periods of onset, incubation, widespread diffusion, peak, and decline. The final stage is stabilization at reduced levels of use" (34).

In exploring the devastation caused by crack epidemics on inner-city communities, ethnographers have called attention to the process through which harm-reducing information develops within a subculture of users. For example, among middle-class, cocaine-using individuals, many users gained information from conventional sources (such as books, magazines, and even scholarly journals) on the progression of cocaine dependence, long-term negative consequences, danger signals, and methods to control or end use. This information then spread through the wider user community. In contrast, researchers note that the inner-city subculture of crack users paid little attention to conventional information sources and were ideologically predisposed to discount what information did reach them. While there was no deficit of warnings about the dangers of crack use in the popular media, ethnographers observed that little effort was made to translate prevention information into more appropriate media messages for inner-city communities.

A 1968 poster commenting on the wide use of marijuana by U.S. servicemen stationed in Vietnam.

FUTURE RESEARCH

Over the past 30 years, ethnographers have contributed to the understanding of substance abuse research through their work among different countries and among different subpopulations in the United States. However, some additional contributions could be made in the following areas.

Filling in the Gaps

The earlier sections on the social contexts of drug use emphasized that drug use in the United States is much more than heroin and cocaine in the inner cities and LSD in the suburbs. Research is needed, for example, on middle-class prescription abusers, substance abusers in rural areas, and hidden populations (e.g., homeless, runaways, dropouts);

since many of these individuals are either excluded from, or under sampled in, the national drug abuse surveys. To further complete the matrix of substance use and abuse in the United States, future research could address not only those individuals whose use is unmanageable, but individuals and communities who do not use, or whose use is moderate and controlled.

Expanding Research Hypotheses

The documentation that cultural and societal norms, to a large degree, shape individuals' and groups' behaviors toward drugs use, could be used to formulate new substance abuse research hypotheses, or expand on existing hypotheses. For example, understanding the etiology of drug use through studies of children will help explain initiation of drug use and provide guidance for prevention efforts. Basic studies that document how children come to perceive drugs are lacking. "... when it happens, how it happens. How they conceptualize, for example, what is a drug and what is a poison, and how that changes when they begin experimenting with drugs" (44).

Planning Prevention Programs

The insight gained by ethnographic research on a community's or subculture's view on substance use could be incorporated to a greater degree in the needs assessment, planning, implementation, monitoring, and evaluation components of substance abuse prevention research. The information gained from ethnographic research could help assure that the prevention information is culturally appropriate not just in a generic ethnic sense, but in terms of the specific cognitive framework and concerns of the target audience. Additionally, the qualitative tools used in ethnography can assist quantitative researchers in the interpretation of substance abuse data in varying contexts.

Identifying Emergent Trends

Ethnographic research is also useful in its ability to relatively quickly document changes in existing drug use patterns or identify the use of new drugs by a particular subculture. This timely information could assist in the planning of appropriate prevention strategies.

SUMMARY

Studies on drug-using subcultures have provided a wealth of knowledge on why, how, and who uses and abuses drugs. Experience-based methods of data collection, such as ethnography, provide the field of substance abuse research with unique information on drug abuse among individuals, groups, and communities. Some of the contributions discussed in this chapter have been theoretical, substantive, and programmatic.

Ethnographic studies have documented drug use patterns worldwide and in so doing have assisted the understanding of societal influences on drug use. These insights have, for example, been utilized in the planning, implementation, and to some extent, evaluation of drug prevention programs in a variety of different social contexts.

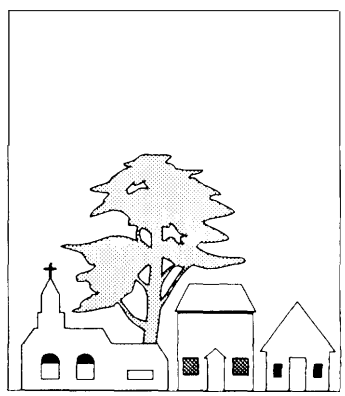
Researchers have also utilized ethnographies to follow constantly changing drug use patterns. Moreover, ethnographers provide valuable data on new drug use such as who is using it, how the drug is being used, and where the probable epicenters of the drug use are.

While not without methodological limitations, ethnography and other experience-based research provide new insights into substance abuse, as well as complimenting more quantitative methods of data collection.

Community Activity Settings 8

This chapter reviews substance use and abuse-related research on factors and interventions in homes, schools, workplaces, recreational and other developmental settings, and community-wide settings. These community activity settings are the major physical and social arenas in communities where individuals interact and learn their values, attitudes, and behaviors, some of which can increase or reduce the likelihood that individuals will use and abuse substances. The addition of treatment settings of all types and correctional settings would provide a fairly comprehensive and systematic overview of all the major settings in communities. Those settings are not discussed at length in this report, however, because of its focus primarily on prevention, even though comprehensive prevention strategies will almost always want to include treatment and correctional components as well.

By focusing on any one of these settings, researchers interested in substance use and abuse can study the interplay of multiple factors in a context, and practitioners can implement programs designed for specific settings. By examining all of these settings together, policy makers and practitioners interested in substance abuse and the healthy development of individuals and communities can identify and, within available resources, implement concrete, systematic, and comprehensive preventive interventions for communities as a whole. The development and strengthening of community-wide norms against the use of substances may well be one of the more important ways to protect individuals against the use of substances. The section on communities discusses some of the issues and tools for community-wide prevention planning and coordination,



There's another tiny nation
that’s worth fighting for.

Partnership for a Drug-Free America

HOMES AND FAMILIES

Although American society expects families in their homes to take the lead in dealing with substance abuse and other problem behaviors (69), families in this country generally receive only limited outside support in protecting themselves against substance abuse. This situation may result in part from the belief that most nuclear families can raise their children largely independently and therefore do not need outside support, and in part from the belief that teens and young adults are more influenced by their peers. The first belief, however, is not supported by long-standing practices in most societies, where extended families and life-long neighbors have traditionally helped raise children (although in the United States many parents do not have access to these additional child-rearing resources because of urbanization, high technology, and family mobility). And the second belief is being questioned by growing evidence that certain parenting practices and family intervention programs can significantly reduce the risk of substance abuse among adolescents and young adults.

An extensive and growing body of research strongly suggests that many families do need, and can benefit from, support from outside the family, and can often protect their children from substance abuse, even into adolescence and adulthood. While some of the findings reported here may appear to be commonsensical, they are presented because they have been addressed by researchers as part of a growing body of increasingly rigorous research. Some of the studies focus on risk and protective factors that are known or thought to be associated with substance use and abuse, while others focus directly on substance use and abuse. To reduce redundancy, factors and programs discussed elsewhere in this report are for the most part not considered here.

Protective Factors

Families can protect against substance use and abuse by providing close family relationships, sufficient monitoring, clear messages about substance use and abuse, and attractive alternatives to substance use and abuse.

Close Family Relationships

Family relationships can help protect against substance use and abuse when they are characterized by closeness and warmth, effective and positive discipline, and successful problem solving and communications. For example, young people who report feeling close to their families are less likely to abuse substances than those who report not feeling close to their families. Parents in such families are more likely to comfort their children when they are afraid, have two-way communications, and give children some say in what happens to them (83,86,152). Because such parents spend more time with their children, there can be more conflict, but the time spent together can also lead to greater mutual understanding and acceptance (23,59).

Parents can better channel their children away from substance use and abuse if they have routinely used effective, age-appropriate discipline methods, including clear expectations and rules about homework, television, curfews, and drugs and alcohol. Such methods are particularly effective when they are enforced by praise and encouragement, instead of by threatening, nagging, and blaming (42,47). In contrast, ineffective or provocative family management practices, including overly harsh or reluctant discipline practices and inconsistent followthrough, are associated with early sampling of substances and later abuse (8,1 15). Unruly behaviors in childhood can lead children to poor achievement in school, social rejection by more conventional peers, and greater association with other children with behavior problems (46).

Skillful handling of problems by families helps children learn how to distance themselves from problems and address them with specific problem-solving strategies (77). Such skills can help children later avoid the use and abuse of substances. By contrast, families where children eventually abuse substances do not make deci-

sions and solve problems as well as other families (97). Positive caregiving and discipline can prevent negative outcomes even for highly stressed, minority, low socioeconomic status (SES), urban families (177). When the birth parents are not available, effective parenting by a surrogate, relative, or neighbor can also be protective (173).

Sufficient Monitoring

When parents or parent surrogates know how their children are spending their time, the risk of substance abuse is low (47). Such monitoring may prevent abuse by reducing access to substances, preventing use of substances, or allowing parents to identify substance use earlier and to apply sanctions. Monitoring may also entail greater involvement by parents in their children's lives, which may help render substance use and abuse less appealing by enhancing feelings of trust, warmth, and closeness in the family. Such monitoring prevents substance sampling across ages, ethnicities, and settings.

Single parents and working parents are often less able to monitor their children thoroughly, because they can be in only one place at a time. However, grandmothers, aunts, after-school personnel, and other caring and supportive adults can also monitor children and help reduce deviant behaviors (59,88). Early autonomy and unsupervised leisure time apparently increase the risk of substance use and abuse by children.

Clear Messages About Effects of Substances, Including Sanctions

Children are more likely to avoid the use of substances if they know that use will bring negative outcomes, such as adverse physical and psychological effects, disapproval, and penalties imposed by parents. Many children develop expectations about the effects of substances as early as the preschool years (100), influenced primarily by their parents. Frequent parental use even of aspirin, cold pills, prescribed psychotropic medications (85), and cough medicine can give children positive expectations about the effects of substances (61).

When parents apply reliable penalties, such as revoking privileges, and coach their children about the adverse effects of substances, use is likely to discontinue (6). By contrast, if the possible adverse effects (e.g., illness and depression) are not emphasized and few negative sanctions are applied when adolescents first use marijuana, while the immediate experiences are to feel pleasantly stoned and potent (87), then continued use and adult drug problems are more likely (37). Parental disapproval of children's alcohol use has been found to be protective across ethnic groups (33). Increased appreciation of risks and social disapproval of substance use is credited with the recent downturn in cocaine and marijuana use nationally (5).

Attractive Alternatives to Substance Use and Abuse

Participation in religious and other conventional and challenging activities can protect against substance use and abuse (26,8 1,111, 173). Especially important are activities about which youth are passionate.

Parents are more likely to guide their children away from substance use and abuse if parents have instilled hope in their children to succeed as adults (172). By contrast, some children do not look forward to and plan for adulthood, but learn only short-term thinking (see box 8-1) and have been encouraged by their parents to believe they cannot succeed.

Parents of inner-city African American children face special difficulties in holding out hope for their children's success through traditional opportunities. Unemployment among African American men is almost 50 percent (24) and the marriage rate among African American women is low and still declining (10), with substance use and abuse among African Americans increasing

BOX 8-1: Example of Short-Term Thinking

Eighteen-year-old Lyle is a senior at an Inner-city high school In four weeks, he will receive his high school diploma In six months, he will become a father

Lyle has a significant history of delinquent behavior, including assault, drug dealing, and grand larceny He has recently withdrawn from a gang because "it's gotten crazy and it's gotten really out of hand" and "1 don't want to die " However, he adds, "1 still hang with the fellows and stuff like that "

Because he '<feels like working, " Lyle is looking forward to getting out of high school He has no plans for college, which he regards as '(too much hassle, to tell you the truth " His plans for the future are vague-to "work, make money, you know' '—but he tries not to think about it much because, "you know, you might die " For Lyle, "the way everything's happening now, you can't really think about the future the way things happen now, you can get shot coming out of your house You can be shot in the window, you know"

Lyle is a daily smoker of ten or more cigarettes, a habit he describes as "like a everyday routine—whenever I can get time to smoke one, I'll smoke one " He drinks a couple beers almost daily, and also smokes marijuana "most likely" every day

But Lyle avoids harder drugs, like cocaine, because "I don't want to kill myself " By way of explanation, he adds "I'd rather kill myself slowly than fast "

SOURCE H Stauber, '1 ve Got Plenty of Cells to Waste Perceptions of danger and invulnerability among reckless-behaving adolescents, Unpublished paper, Harvard Graduate School of Education in progress

as they reach 26 to 34 years of age, instead of decreasing as with other racial and ethnic groups (1 64).

Risk Factors

Families also face risk factors, such as parental neglect and rejection, behavioral problems and crime, physical and sexual abuse, substance abuse in the family, failure in school, emotional problems, negative life events, early use of substances, substance abuse in the neighborhood, and poverty, unemployment, and hopelessness. Because some of these factors are discussed elsewhere in this report, this section will focus only on parental neglect and rejection, physical and sexual abuse, substance abuse in the family, negative life events, and drug trafficking in the neighborhood.

Parental Neglect *and* Rejection

Children who are neglected anytime, but especially from earliest childhood, are at greater risk of substance abuse (17,1 42). When children have been continually rejected, they become immune to parental guidance. Such children fail to form close relationships, get along with others, solve problems, and regulate impulses.

Physical and Sexual Abuse

Physical or sexual abuse in childhood leads to greater vulnerability to substance abuse in adolescence and adulthood (38). Rape victims, particularly those with Post Traumatic Stress Disorder (PTSD) symptoms, are 20 times more likely to have subsequent substance abuse problems (165). Substance abuse rehabilitation programs report that as many as 60 to 70 percent of the female patients and 25 percent of the male patients have been sexually victimized, while 43 percent have been beaten (45,99,92). Victims of sexual or physical abuse often report wishing to avoid unpleasant memories, including flashbacks to the abuse (126). The use of substances may help some victims forget for awhile (see box 8-2).

Substance Abuse in the Family

The biological children of alcoholics have a higher than average chance of abusing alcohol, even if they are reared away from their alcoholic parents (40,63). Thus, apart of the vulnerability to alcohol

BOX 8-2: Janice

Janice, a 28-year-old, white, married female, was in outpatient treatment for bulimia nervosa, a binge-purge pattern of eating that began when she was 18 years old. She also had an intermittent history of alcohol abuse dating from midadolescence Janice appeared to be well-motivated in treatment, She used the psychoeducational approach taught by her therapist to increase her knowledge of how her binge-eating and moodiness were related to her restricted daily caloric intake. She made progress quickly, using cognitive behavioral techniques to challenge her distortions and understand her behavior; she began to eat consistent meals in adequate amounts These changes led to a decrease in her binge-eating and self-induced vomiting. However, along with this progress she became increasingly anxious, fearful, and agitated about weight gain (despite the fact that little or none had occurred), At the same time, she became overwhelmed by the intensity of the feelings she experienced, was having bad dreams, and withdrew from her support system in ways that angered her friends She once more resorted to inconsistent meal patterns, dieting, poor nutrition, and—inevitably—binge-eating and vomiting Her alcohol use increased,

Janice's symptomatology shifted once she significantly decreased her bulimic behavior. Instead of dealing with everyday feelings, behavior, and thoughts, she began to relive memories from her unresolved traumatic past, These memories started with vague feelings of uneasiness, which grew more intense as she binged less. She then began to remember her dreams, which, as they came into clearer focus, caused her to be suspicious of her friends, and particularly of the men around her Janice reported feeling fine one minute and then very frightened the next Whereas she used to be flattered by any male attention, she now felt fearful when men looked at her She started to remember multiple sexual assaults in her past, both by persons known to her and by strangers. She felt increasing urges to suicide, and observed the reality of her internal suffering as being "too awful " As she said, "If this is what recovery is all about, I don't think it's worth it, I'll take my chances and struggle with addictions If I can't stand that, there's always suicide, "

SOURCE M P Root, "Treatment Failures The Role of Sexual Victimization in Women's Addictive Behavior, " *American Journal of Orthopsychiatry, 59(4), 543, 1989.*

abuse, at least for some, may be inherited. Children of alcoholics, for example, may experience more positive effects or fewer negative effects from the use of alcohol. Either of these responses could result from individual differences in experienced pharmacological effects of drugs (135) or differences in temperament that can be modified by the use of alcohol and other drugs (154).

In addition to friends and acquaintances, relatives are a common source of alcohol and other drugs for teens. Family members and other relatives can be very persuasive when they offer such substances to teens. One study, that included both abstainers and heavy users, found that young people refused available substances, mainly alcohol, 46 percent of the time when friends offered them, but only 18 percent of the time when relatives outside the family offered them. When their own parents offered such substances, the young people never refused (9). Family members who use substances can also inadvertently make them available to teens by leaving family cabinets containing alcohol or pills unlocked (35).

Family members can learn how to use alcohol and other drugs by watching and listening to abusing family members; they can also adopt the abusing members' expectations about the effects of these substances. For example, children of alcoholics are more likely to think that the purpose of drinking is to get drunk (107). They also have greater expectations for the use of alcohol (143), and sometimes believe they can do things better after a few drinks.

Families with a substance abusing parent experience significant disruptions in many aspects of their lives, including child rearing (160). Substance abusing parents and spouses often have difficulties guiding their children, especially away from substances, because of inconsistent nurturing, monitoring, and disciplinary practices (36,47). Their abuse of substances can also rob children of stability in life and of competent adult role models. Even a nondrinking spouse can become so involved with the drinking spouse and so depressed and isolated from social support that children feel neglected (13). Marital quality can be affected (160), and the level of conflict and verbal and physical aggression can be high (151). In addition, adolescent and adult children of substance abusers are less influenced by their parents and have lower parental attachment, less involvement with other people, more difficulty getting along with other people (84), lower self-esteem, lower academic achievement, higher depression (1 28), and a greater number of other psychiatric symptoms (1 43).

Major Negative Life Events

Substance use and abuse often increase as children experience more negative events (106, 174) (see table 8-1). Adult alcoholics report a significantly higher number of severe life events just before their alcohol dependency begins (65), with seven out of eight of them reporting disruptions in important personal relationships, such as with friends, lovers, or spouses. Among the elderly, late-onset alcoholism is reportedly preceded by new feelings of loneliness and depression, perhaps also due to recent losses of important relationships (120,1 34).

Such negative 1ife events may heighten vulnerability to substance abuse by increasing depression (174). For instance, one study found that children who had lost a parent to death had a 7.5 times greater risk of developing a depression than other children (60). Negative life events may also occasion perceptions of helplessness and decreased personal control; these too can be offset, at least for awhile, by some drugs (91).

TABLE 8–1: Ranking and Weighting of Major Negative Life Events of Children

Event	Weight [a]
Death of a parent	91
Divorce of parent	84
Marital separation of parents	78
Child acquired a visible deformity	69
Death of a brother or sister	68
Serious Illness or accident requiring hospitalization of child	62
Serious Illness or accident requiring hospitalization of parent	55
Death of child's close friend	53
Increase in arguments between parents	51
Change in father's occupation requiring increased absence from home	45
One parent arrested or in serious difficulty with the law	44
Serious Illness requiring hospitalization of brother or sister	41
Death of a grandparent	38
Loss of job by parent	38
Brother or sister have serious trouble	36

[a] Readjustment weights derived from Coddington, 1972a

SOURCE I Sandier, & M Block, "Life stress and maladaptation of children, " *American Journal of Community Psychology* 7(4), 425-440 1979

Families are likely to have the greatest difficulty preventing substance abuse if friends abuse substances (86, 109) or if substance use is rampant in the neighborhood (39,44,5 1, 124). Such conditions encourage substance use and reduce the barriers against use by making drugs continuously available and socially acceptable (even appeal ing) and by providing temporary escape from the frequent hassles and tragedies of life among highly transient and troubled (rather than stable and helpful) neighbors (146).

Programs To Enhance Protective Factors

This section discusses some of the numerous programs that have been developed for families with infants, school-aged children, and young adults. **Few of these programs specifically target sub-**

stance abuse and addiction, but many have been found to enhance family-based protective factors and/or reduce risk factors that can be associated with drug abuse. Unlike some school-based programs, methodologically rigorous studies correlating the efficacy of these programs to the level of substance abuse and addiction have yet to be done.

Families With Infants

Parent education, prenatal and infant care, and social support programs help strengthen involved and responsive parenting (4), which in turn can significantly reduce substance abuse risk factors such as child abuse and neglect and childhood accidents.

Parents who had participated in such programs attained more education, had fewer other children, and were less likely to be on welfare by the time their children were 10 years old, than parents who had not participated in such programs. Participating parents reported less stress and more confidence in their parenting (175). Most importantly, children were dramatically less likely to experience attendance, behavior, or academic problems in school (112,138,139),

These programs can take many forms:

- a neighborhood house where parents and their infants can come during the day for companionship, child care advice, social services, and health care from a stable professional staff (139);
- twice-a-week home visits by the same nurse, from pregnancy until the child is 2 years old (1 12);
- home visits, with child development advice, help in acquiring other services, and time-limited family counseling to lower conflict and increase support from the extended family;
- a public school dedicated to pregnant teens and new mothers and that provides health and child care education, social services, and intensive high school education (138); and
- parent meetings in the hospital where the baby was born (175).

Families With School-Age Children

Parent training and support programs can help parents of school-aged children motivate their children to more willingly pay attention to and accept parental guidance and to develop skills for success outside the family. A parent training program called WINNING, provided through a Texas school system, increased positive and corrective feedback from parents to children, increased parent-child interactions, and decreased the attention parents gave to inappropriate child behavior. Concomitantly, the portion of their children's behavior that was inappropriate decreased (43).

Another parent training and support program, "How to Help Your Child Succeed in School," was offered through Seattle, Washington schools to increase protective factors and reduce risk factors for substance use and abuse. After the program, parents spent more time reading with their children and provided more consistent positive and negative consequences for behavior (70,7 1, 72,73,74).

Involving parents more in schools can further support parenting and prevent it from being undermined by peers and by school environments. In the School Development Program in New Haven, Connecticut, for example, parents serve as members of the School Advisory Council and as employees or volunteers in classrooms. Significant improvements have been seen in student attendance, language skills, math scores, and social competence, and virtually all classroom behavior problems have been eliminated (34,41).

A community grassroots effort to provide these and other resources for parents began 17 years ago in the Ravendale section of Detroit, Michigan. The "Joy of Jesus" programs now support families living in more than 30 contiguous blocks. Every day after school about 250 youth of all ages participate in scheduled activities such as tutoring, music, dance, gym, writing, teen sex education, cultural field trips, university tours, and an entrepreneur's club (for 30 teens who are starting their own businesses). This program provides several substance abuse protective factors and prevents the risk factor of school failure, by monitoring re-

port cards and enrolling students in an individualized after-school motivational learning program, if necessary.

In Los Angeles, California, an after-school tutoring and activities program has been developed in a for profit apartment building. The program, called EEXCEL, provides a room in the building and live-in counselors and tutors who offer children a "sanctuary for education [and] ...incentives for learning." When report cards come out, good grades are recognized at parties. Only those families that want this resource for their children are accepted as tenants in the building (108).

Atlanta, Georgia-based Inner-City Families in Action has been presenting comprehensive information in a series of 2-hour sessions about how specific drugs, such as alcohol or crack, affect every system in the body, to residents in two Atlanta housing projects. The curriculum is called "You Have the Right to Know." After 2 years of using the curriculum in many locations, the narcotics arrests in both housing projects are down (52).

Through flyers, personal invitations from schools, and a 1-hour television special, parents were recruited to 87 local sites around Seattle, Washington, for workshops on "Preparing for the Drug (Free) Years," led by trained parents. Surveys showed that parents' attitudes and behaviors were changed in the direction of providing protective factors. Parents also rated highly the workshops' content, process, and leaders (71).

The Midwestern Prevention Project (Project STAR) in Kansas City, Missouri, used the local media to recruit parents to become involved in a school and parent substance abuse education course and to repeat the messages for more than one year. This intensive effort reduced the rate of increase in initiation of alcohol, tobacco, and marijuana use among seventh and eighth graders who had participated in the program, as compared to those who had not participated (11 6).

Families With Young Adults

Job Corps, Peace Corps/VISTA programs, American Conservation and Youth Service Corps, National and Community Service Programs, universities, and the military all provide young people sheltered work experiences, educational training if necessary, and opportunities to live away from home with other young people in structured environments. Research shows that such experiences enhance the confidence of participants in their ability to work hard (48).

Programs To Reduce Risk Factors

Reducing Drug-Trafficking and Substance-Using Peers

Operation Clean Sweep, now being run by the Chicago, Illinois, Housing Authority, is designed to reduce drug dealing and other crimes in housing projects. Staff approach one high-rise building at a time, spending at least a whole day at the building. State and local law enforcement officers and housing authority security officers search apartment units (if there is reasonable cause) for illegal weapons and unauthorized residents. Authorized residents are given photo I.D. cards, while others are put on the lease, given a 2-week pass, or asked to leave. The maintenance staff makes repairs, cleans graffiti, encloses lobbies, and builds a security station for 24-hour-a-day surveillance and review of photo I.D. 's and passes for admittance. The program is being replicated in cities across the nation, with funding and technical assistance from the U.S. Department of Housing and Urban Development (HUD).

Reducing Physical and Sexual Abuse

Physical and psychological security is important for the emotional well-being of children (30) and may well reduce their risk of later substance abuse. Mandatory arrest and brief incarceration for physical and sexual abuse of children or mothers has been shown to deter more repeat offenses than do warnings or counseling alone (144), and

court-mandated treatment for convicted offenders seems to reduce later abuse even further **(50).** Since 40 to 87 percent of adult sexual or physical abusers also report alcohol or drug abuse, individuals treated for family violence should perhaps also be screened and, if appropriate, treated for substance abuse (176).

Reducing Substance Abuse in the Family

Substance abuse treatment for the family can reduce substance abuse in the short-term and maintain those reductions in the long-term (27,75, 101,147,149, 153,). Substance abuse treatment for married adults is more effective when both spouses are involved (96), and especially with a behavioral approach to marital problems (1 10). Clearly, families can help rehabilitate substance abusers, thereby reducing the risk of substance abuse for other family members.

Reducing Impact of Negative Life Events

Linking people with modest community supports during crises or adjustments can reduce risk factors and enhance protective factors. For example, when widows were contacted individually by trained, previously widowed persons to discuss grief and decisions to be made, 61 percent accepted the widow-aide services (145) and one month after bereavement were less depressed and less preoccupied with the past than widows who had received no intervention. One year later, the intervention group was significantly more resocialized in their roles as singles; two years later, the health of the intervention group members was significantly better than that of control group members (168).

Also, a 6-month program for newly separated or divorced people in Colorado (which included both one-to-one counseling by trained volunteers and group meetings about practical problems, such as career planning and child-rearing) significantly reduced the participants' problems and their anxiety, nervousness, and fatigue. It also improved their psychological adjustment (less guilt and self-blame, more competence), as compared with a randomly selected control group (18). More indirect approaches have also been tried. For example, socially isolated and lonely individuals, who were provided a free blood pressure station in the lobby of their innercity single room occupancy hotel, were introduced to each other by the nurse and later formed a "Senior Activities Club." In another example, a surplus food distribution service, that required individuals to work together to get their food, produced new friendships (1 17).

Reducing Parental Neglect

Parents whose children failed to maintain gains after parent education or family therapy are often socially isolated and subject to seemingly insurmountable daily problems (49). An experimental program—with weekly follow-up sessions with isolated parents, to discuss environmental problems that affected how parents saw their children's behavior-reduced maternal criticisms of children, negative responses by children to mothers, and child problem behaviors (170). When the weekly discussions stopped, however, the negative interactions resumed.

In a more comprehensive program for low SES parents believed by Child Protective Services to be at high risk for child abuse or neglect, Project 12-Ways held meetings with parents in their homes (95). Treatment goals were developed and, as needed, behavioral training was provided in stress reduction, assertiveness, self-control, leisure time planning, marital counseling, and job finding. Social support groups, alcohol treatment referral, homemakers, physicians, and mental health workers were also involved. Parent compliance and involvement in this 5- to 6-month program were high. Twenty months after treatment, only 2 percent of Project 12-Ways parents abused or neglected their children, while 10 percent of a nonprogram comparison group did.

Families on the verge of having children placed in foster-care, group homes, or psychiatric hospitals can benefit from family preservation programs. Children have fewer behavioral and academic problems when they are raised by birthparents in safe homes (130). Thus, the goal of a family preservation counselor is to help the family

BOX 8-3: Dara

Dara (20) was the natural mother of Christina (9 months) Christina was in danger of placement in foster care due to the cocaine addiction of her mother Her father, Matt, was serving time in jail on a drug charge Christina's older brother, Jason, was placed in foster care prior to Homebuilder involvement Dara's addiction prevented her from properly caring for herself and the children Dara rented the upstairs apartment in her parent's home Her 19-year-old boyfriend, Brian, spent a great deal of time with her and Christina

I helped Dara find out about drug treatment centers and a schedule for Narcotic Anonymous (N A) She missed her first drug evaluation because of having an abortion She and Brian went to one N A meeting and then missed many days The CPS caseworker met with me and Dara and stressed the Importance of her drug recovery Dara agreed to complete the evaluation as well as attend N A meetings Initially I accompanied her to the N A meetings for moral support Sometimes Brian would go and the rest of the time her mother would accompany her Dara successfully completed her drug evaluation and attended regular counseling sessions with a drug counselor She volunteered for urinalysis, "just to keep her honest " Dara got Involved with other young adults in N A They went to eat together and went out to dances and movies She began associating with a new peer group The CPS caseworker authorized maximum day-care to be paid for so she could attend her meetings and counseling Dara's mother volunteered to baby-sit Christina if Dara was with her friends from N A

Dara's husband got out of jail and wanted a divorce He filed for custody of both of their children I helped Dara arrange for legal aid She said she was more determined than ever to "stay straight so she would look good in court" over the custody of the children

Dara asked her boyfriend to move out so she could live by herself She and Brian continue to stay in contact from time to time Dara retained custody of Christina She and Matt agreed on joint custody of their son, Jason, and Dara saw him every other weekend. She continued drug counseling and attending N A Her urinalysis always tested negative

SOURCE J Kinney, D Haapala and C Booth, Keeping *Families Together,* (pp 22-23) (New York Aldine De Gruyter, 1991)

out of the crisis and learn how to retain the child safely at home. The interventions are typically intensive and brief—for example, a counselor is available for meetings in the home 24 hours a day, 7 days a week, for about 6 weeks. The counselor deals with any relevant problems, helping the family clarify values, set goals, and solve problems, and helps connect family members with community resources (see box 8-3).

Many families, especially those with substance abuse problems, need more prolonged help. A family support program that provides such longer term support is Camden House, in the Ravendale section of Detroit, Michigan. A rundown house was purchased, renovated, and made the center of an outreach and drop-in program for about 1010-cal families with multiple problems that included substance abuse, lack of skills, chronic unemploy - ment, early pregnancy, and crime. After staff had worked with the families for one tot wo years, taking one problem at a time and actively mentoring the parents, six out of 10 of the original parents were out of the Camden House program, drug-free, trained and employed, and safely and responsibly raising their children.

SCHOOLS AND PEERS

Millions of school-age youth in the United States experiment with alcohol, tobacco, and other drugs annually, often (especially with alcohol) in ways that can cause overdose deaths, accidental injuries or deaths, and permanent impairments. Many school-age youth continue to use substances and later develop long-term addictions. To address these substance abuse problems, schools provide

WHAT IS YOUR CHILD TAKING IN SCHOOL THIS YEAR?

Your child isn't just learning about History and English in school. He's also learning about amphetamines, barbiturates and marijuana.

Drugs are rampant in our schools today.

Kids are taking them before school. They're taking them between classes, School has even become one of the more convenient places to buy drugs.

The sad part is that all this doesn't just affect those kids who are taking the drugs. It affects all the kids. Drugs keep everyone from learning.

Our schools need our help.

As a parent, you can do your part. Talk with your child. Find out how bad the problem is at his school.

Then talk to other parents. And decide what you as a group can do to get drugs out of the classroom.

Also, contact your local agency on drug abuse. They can provide you with valuable information as well as sound advice.

School is your child's best chance to get ahead in life. Don't let drugs take that chance away.

PARTNERSHIP FOR A FOR A DRUG-FREE AMERICA

the most important settings for reaching young people with standardized, broadly applied educational and preventive messages.

Because school-age youth are especially likely to initiate the use of alcohol and other drugs, much of the research has focused on use, rather than on abuse and dependency. Such research is nevertheless relevant to an understanding of abuse and dependency, since use is a precondition and contributor to abuse and dependency and even experimental use can be harmful. For example, nearly half of all youth who experiment with cigarettes develop long-term smoking habits, and alcohol and marijuana use by youth with no chronic problems still contributes to highway deaths, crime, and violence. This section summarizes results from an analysis of survey research on the causes of school-age substance use and discusses school-based prevention programming.

Analysis of Survey Research on Causes of School-Age Substance Use

OTA commissioned a review of the survey research literature on school-aged substance use that compiled, classified, and examined 9,930 statistical analyses from 242 separate studies. This is by far the most extensive systematic examination of this body of research conducted so far. Most of the studies dealt with school-based populations, but some focused on school-age army recruits, dropouts, children of alcoholics, and individuals involved in clinics. The studies reported statistical relationships between substance use and its postulated causes. Statistical findings from the study reports were sorted into 11 major categories and 50 subcategories (see table 8-2), and then analyzed to identify strong, moderate, and weak statistical relationships, as well as those that had been insufficiently studied.

Characteristics of Database

The studies tended to focus on so-called gateway substances, with tobacco, alcohol, and marijuana analyses accounting for 82 percent of the completed analyses (see figure 8-1). Cocaine, inhalants, heroin, and prescription drugs, which have recently received extensive social attention, have been relatively ignored by quantitative researchers to date; none of these latter categories of substance use accounted for more than 5 percent of the analyses in the research reports examined. Gateway drugs are indeed important, since they may lead some individuals to later abuse. Nevertheless, the literature has gaps. Inhalants, for instance, may well be one of the most commonly used and abused substances among some youth, but they have received almost no attention from survey researchers.

Although the primary measures were of use, not abuse, the database included some measures of alcohol abuse (e.g., drunk driving and impairment from alcohol use). Abuse of cocaine, heroin, and analgesics was not measured. The percentages of analyses in the database for each of the 11 major types of independent variables is displayed (see figure 8-2). The types of independent variables most studied were personality, use by others, and cognitive factors (including attitudes, beliefs, and values).

Results of Analysis

After being sorted into the 11 major categories and 50 subcategories, the average of all the correlations in each subcategory was calculated. Then, each subcategory was ranked by its average correlation and the rankings were divided into three groups, defined by ranges of correlations: primary (with correlations over .30), secondary (with correlations between about .20 and .30), and tertiary (with correlations under about .20) (see figure 8-3).

Primary correlates

The four variables that dominate as correlates of and possible contributors to substance use are: 1) prior and concurrent use of substances, 2) substance use by peers and friends, 3) perceived peer attitudes about substance use, and 4) offers to use substances, The prominence of prior and concurrent use is consistent with the reinforcing nature of substance use itself. The prominence of the other three variables emphasizes the importance of

TABLE 8-2: Factors in School–Aged Database Associated With Substance Use

- **Prior Use**
- **Drug Use by Others**
  - Peer/friend use
  - Use and deviant behavior by a relative
  - Sibling use
  - Availability
  - Parental use
- **Intentions**
- **Overt and Normative Pressures**
  - Peer/friend attitudes about drug use
  - Offers to use
  - Others' attitudes about use
  - Motivation to comply with pressure
  - Media influences
  - Others" attitudes about other issues
- **Cognitive Factors**
  - Attitudes
  - Beliefs about psychological consequences
  - Value of achievement
  - Religious values
  - General values
  - Beliefs about health consequences
- Demographic Factors
  - Age/grade
  - Race
  - Geographic identifiers
  - Gender
- Personality Characteristics
  - Deviance
  - Independence
  - Affect
  - Personality traits
  - Social personality traits
  - Self-esteem
  - Locus of control
- **Peer Factors**
  - Intimacy
  - Peer group characteristics
  - Peer bonding
  - Peer-parent relations
- **Competence**
  - Self-efficacy
  - Stress management skills
  - School performance
  - Self-management skills
  - Intelligence
- **Institutional Influences**
  - School bonding
  - Participation in nonstructured activities
  - Religious affiliation
  - Moral codes
  - Church attendance
  - Participation in structured activities
  - Academic expectations
- **Home Factors**
  - Socioeconomic status
  - Parental relations
  - Parents' psychological traits
  - Parents' marriage
  - Parents' education
  - Family composition

SOURCE Off Ice of Technology Assessment, 1994

the social environment in contributing to and reinforcing substance use among school-age youth.

Secondary correlates

Of the 15 variables judged to be of secondary importance, seven are social variables: 1) susceptibility to peer pressure, 2) resistance skills, 3) perception of social pressure to use substances, 4) beliefs that such pressure can be effectively handled, 5) beliefs about social consequences of use, 6) bondedness (especially to school), and 7) peer group characteristics. With the exception of parent attitudes about substance use, other parental variables-such as parental supervision, monitoring, and relations—are notably missing as primary or secondary correlates.

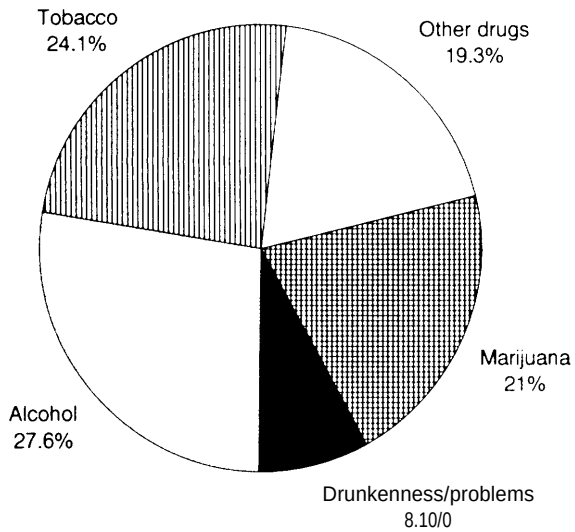
Tertiary correlates

Of the 38 variables found to have no more than a minor role in substance use, 10 were included in at least 100 of the correlational analyses in the database for this review. They are: 1) substance use by parents, 2) personality traits, 3) intelligence, 4) social personality traits, 5) parental relations, 6) affect, 7) participation in structured activities, 8) bonding with the peer group, 9) beliefs about health consequences of using substances, and 10) self-esteem.

Variables requiring further study

Several of the secondary and tertiary variables in the studies reviewed here were insufficiently examined to allow general conclusions to be drawn.

FIGURE 8-1: Distribution of Drug Categories Used for Dependent Variables in Included Analyses



SOURCE Off Ice of Technology Assessment, 1994

However, they may later prove to be useful to the field. For example, religious affiliation and the development of substance use-specific values, while not extensively studied as separate variables, both address issues related to social norms and influences that have often been found to be associated with substance use; thus, an association between these two variables and the onset of substance use might be expected. Also, availability may prove to be important, especial] y if it is defined in future studies more broadly (e.g., as physical and social availability, as discussed in ch. 5) rather than as potential availability (that is, how easy it appears to be to get a substance, if motivated), as many current surveys define it,

Preventive Interventions

Schools can seek to prevent substance use and abuse through curriculum-based drug prevention programs and through other, more novel approaches, such as school-based clinics, student assistance programs, and holistic environmental interventions. School-based prevention efforts have been hampered, however, by a lack of good evaluation data on the most widely marketed programs and by insufficient information about and dissemination of the more promising programs.

Numerous studies of the effectiveness of curriculum-based drug prevention programs have been completed and reviewed (67). Studies of prevention programs focusing on tobacco have been extensively reviewed (1 6,20,54,58,94,132,1 55) and alcohol studies have been reviewed several times (62,64,102). Reviews of school-based prevention curricula that specifically target marijuana or cocaine do not exist. However, several reviews have examined studies of programs designed to prevent the use of multiple substances (7,25,102,131 ,156). Even these reviews, however, typically focus primarily on tobacco and alcohol.

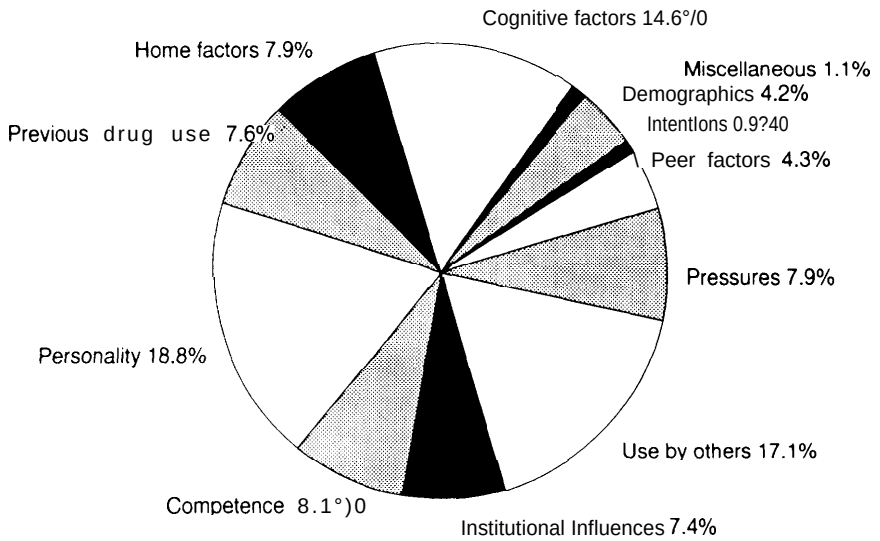
Effectiveness of Drug Abuse Resistance Education Program

Three merchandised curriculum programs have captured a sizable share of the prevention program market: DARE (Drug Abuse Resistance Education); Quest: Skills for Living; and Here's Looking at You 2000. Of these, evaluations only of DARE have been reported in sufficient numbers to allow conclusions to be drawn.

The DARE program is delivered in schools by uniformed police officers who have been trained in any of five regional training centers. It was designed by the Los Angeles, California, Unified School District, which borrowed from research-based programs developed in the early 1980s. DARE is delivered annually to about 5 million students in all 50 States, at a total cost of about $50 million (an average annual cost of about $10 per student) (93). DARE is thus one of the better funded drug prevention programs in schools.

One research team examined 17 published and unpublished evaluations of DARE (53). For the 11 studies that met minimal standards of methodological rigor, the average reductions in substance use were very small. Use among control schools and DARE schools was roughly equal. The few studies that were longitudinal found neither short-term nor long-term reductions.

FIGURE 8-2: Distribution of Analyses of Major Independent Variables Studied in Included Research



SOURCE: Office of Technology Assessment, 1994.

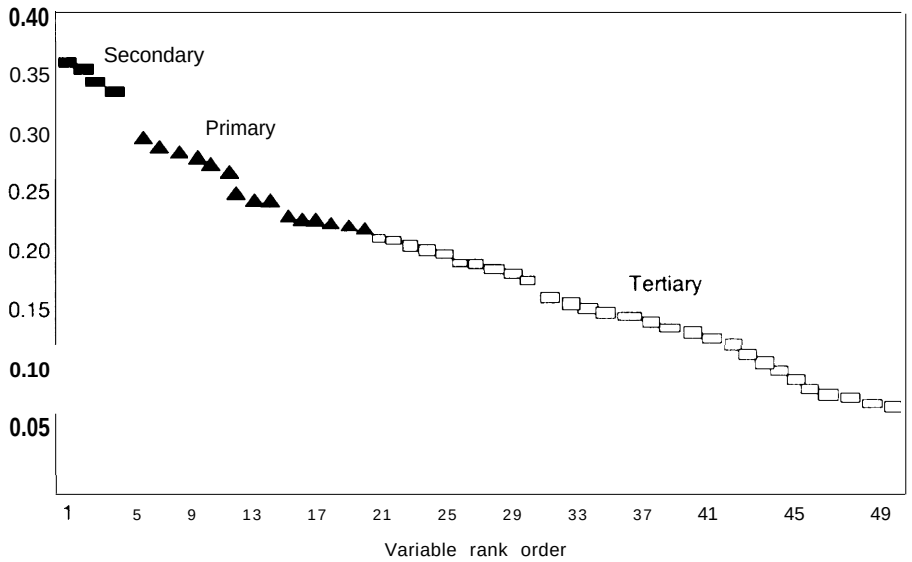
DARE has important strengths, including favorable reactions among students who have participated in DARE programs, widespread political support, substantial funding, uniformly reported improvements in school-police relations, high quality of program implementation, and expert marketing. However, these strengths have not guaranteed that DARE is always effective as a drug prevention program. A scientific advisory group has been established to review research and evaluation of the DARE program and to consider changes in the curriculum.

The General Accounting Office (GAO) estimated that about one-fourth of the funds given to the States and local schools under the Drug-Free School and Communities Act went toward purchasing and delivering school curricula (163). However, widely adopted curriculum packages (such as Quest: Skills for Living; Here's Looking at You 2000; Project Adventure; BABES; Project CHARLIE; and Children Are People) have presented no adequate evaluation results that allow program effectiveness to be judged. Evaluations conducted to date have been primarily short-term reviews for dissertations and theses, and they lack interpretable behavioral end-points. Given the widespread dissemination of these curricula, quality evaluation studies would be important.

Conclusions About Curriculum-Based Prevention in Schools

Curriculum-based drug prevention efforts to date can be characterized as showing promise (67,156), but critics point out that the effectiveness of these programs, especially those that are being commercially marketed, has not yet been proven and that significant difficulties remain (102). Some of these are methodological difficulties intrinsic to all field trial research, while others relate to the possibly intrinsic limitations of curriculum approaches when used alone. Individual studies suggest that curriculum-based prevention programs in the schools may ultimately be proven to be effective for preventing substance use among some youth, especially when used as components in more comprehensive substance use prevention efforts. However, school-based pre-

FIGURE 8-3: The Rank of Average Correlation Coefficient



SOURCE: Office of Technology Assessment, 1994.

vention technologies currently in use have not been refined and tested enough to demonstrate their effectiveness for reducing substance use for students in general, and especially not for multiproblem youth, who are at higher risk of substance abuse. Clearly, for DARE and for the other major school-based curriculum prevention programs, resources must be set aside to properly evaluate program results.

Noncurricular Approaches to School-Based Prevention

Curriculum-based efforts have dominated the field, largely because they are relatively simple to understand, implement, and replicate, and because methods to evaluate them have become standardized. However, curriculum-based prevention programs have not been demonstrated to be effective, and several noncurricular approaches have recently emerged, including student assistance programs, school-based clinics, and more holistic school-community collaborations and alterations of psychosocial environments in schools. These approaches have been evaluated only rarely, but interest in them has been growing. For example, although student assistance programs remain largely unevaluated, they accounted for about half of the spending, under the Drug-Free Schools and Communities Act, in six recently evaluated urban school districts (163).

Student assistance programs try to identify substance-using students early on and then provide social support, build skills for dealing with life problems, or refer to treatment, as appropriate. Peers often help as crisis managers, small group facilitators, and referral agents, while adults often act as program facilitators and counselors. Programs typically counsel students who are children of alcoholics, who use alcohol or drugs abusively, and who are performing poorly at school. Programs can also help parents address their children's needs.

Only three evaluations of student assistance programs were found by OTA for this review. Two focused on process issues only (89,1 18), while one addressed program outcomes (90). The outcome study focused on interventions for students in six residential facilities, including a locked

correctional facility. Although the sites are atypical for student assistance programs, the program otherwise resembled student assistance programs in schools.

The outcome study found that marijuana and tobacco use declined among program participants in five of the six facilities. Alcohol use declined in half of the sites, while alcohol use in two sites remained unchanged and in one site rose slightly. The declines in use were observed at about nine and 15 months after participation in the program. Although these results are promising, one study (especially a study conducted in nonschool settings) cannot support general conclusions about the effectiveness of student assistance programs in schools.

Many schools, either directly or through community agencies, are bringing services into schools to help deal with social and health problems that are often interrelated, such as depression, violence, substance use, and sexually transmitted diseases. School-based clinics and youth service centers are being set up to provide comprehensive and integrated health and social services. This new wave of programming has been supported by State governments, local school districts, and private foundations.

School-based clinics have been developing in response to growing poverty, widespread lack of insurance, and increases in health and social problems among youth. One study indicates that the percent of adolescents defined as living in poverty increased from 15 percent in 1979 to 19 percent in 1986 (22). Not all youth living in poverty are covered by Medicaid or other health insurance, and millions of other youth (e.g., in near-poor or recently unemployed families) also lack health insurance. Violence, teen pregnancy, and substance use and abuse remain high or are increasing in many communities, and these problems often require direct one-on-one medical or social interventions, if they are to have a chance of being resolved.

Self-referral and other data suggest that school-based clinics are providing health care and social support. For example, a survey of 306 such clinics in 33 States and Puerto Rico (22) found that about half the visits were for medical problems, such as injuries and illnesses, with 40 percent of the visits for counseling and 10 percent for birth control supplies or counseling about reproductive issues more generally. No evaluations seem yet to have focused on the effectiveness of school-based clinics for assisting with the treatment and prevention of substance use and abuse. School-based clinics perhaps should not focus primarily on these problems, but as clinics expand in numbers questions will naturally and more frequently arise about their role in addressing substance use and related problems.

Several notable collaborations between schools and other community agencies and resources have been supported and, at least in part, studied. For example, the Community Partnership Program, administered by the Center for Substance Abuse Prevention, has supported more than 250 local partnerships for the prevention of substance use and abuse, with over 60 percent actively involving schools as coalition members. Each site must have a local evaluator that will monitor primarily program activities, and a national evaluation to monitor program activities and outcomes has begun. The local evaluations are expected to vary widely, in part because uniform, accepted standards for community-wide program evaluation have yet to be developed. Outcome findings are expected by 1997.

The Midwest Prevention Project (1 16) provides and studies school-based interventions in the greater Kansas City, Missouri, metropolitan area and in Marion County (Indianapolis), Indiana. Due to constraints in the study design, the evaluation results to date speak directly only to the impact of the school-based curricular interventions; the impact of community organization, parental, and media components cannot be evaluated. Nonetheless, this approach suggests the potential for communities to support school-based prevention efforts.

Cities-in-Schools is a national nonprofit organization devoted to preventing students from dropping out, through partnerships among schools, local governments, and businesses. Cities-in-Schools operates in 122 communities in

21 states with 384 schools participating in the program. The national organization strives to bring health, social, and employment services into schools across the nation, to help youth find jobs, tutors, and counseling and to motivate them to stay in school. A national staff assists local boards. A prominent person in business presides over each local program, directs fund-raising, and organizes a team of professionals to help potential dropouts. In most programs, a case manager is assigned to each high-risk child. Beyond these basics, programs vary greatly, focusing on a diversity of prevention and intervention strategies. Several Cities-in-Schools sites have achieved national attention. Although little concrete evaluation data are available about the effects of these programs in general or on substance use, the model appears promising and warrants further study.

Changing the social or physical climate in schools may also help reduce substance use and abuse. Future research and evaluation studies could focus on the impacts on substance use and abuse of this and other holistic models, such as open versus closed campuses, alternative schools, and after-school care programs. These models may be especially promising for high risk youth suffering from multiple risk factors and limited protective factors, many of which are rooted in problematic (often substance using and abusing) homes, neighborhoods, peer groups, and other subcultures, which cannot easily be influenced by more 1imited school-based prevention approaches alone.

WORKPLACES

Workplaces can also contribute to and protect against alcohol and drug abuse. This section reviews literature on factors and interventions associated with substance abuse in the workplace, with a special focus on the role of workplace settings themselves. Researchers have investigated the causes of substance abuse among workers for nearly four decades, and U.S. management and labor have been concerned about workplace substance abuse for over a century (150,158, 159). Alcohol has been the drug most studied in workplaces and appears to be the drug most commonly used.

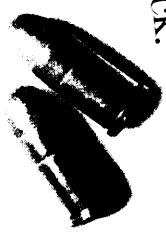
Magnitude of Problem

The prevalence of substance abuse among the employed remains inadequately documented, based on a small number of flawed studies. For American workers more information exists on the extent of alcohol use and dependence (although gaps remain) than on the use and abuse of illegal substances (57, 68, 114).

The 1988 National Health Interview Survey found that about 13 percent of employed men and 6 percent of employed women were alcohol dependent (68). This nationwide household survey of almost 27,000 individuals found that, for both men and women, the percentage of white-collar workers who drank was greater than the percentage of blue-collar workers who drank. However, among those who drank, blue-collar workers drank more than white-collar workers. Consistent with an earlier survey in Detroit, Michigan, alcohol-related disorders were also found to be greater among blue-collar workers, with the rates highest for men who were craftsmen, laborers, and service workers, and for women who were machine operators, laborers, and service workers (11 4). Another investigator has reported that the rate *of* on-the-job substance use among young men in the 6 months prior to the study was about 28 percent (105).

Substance abuse contributes to workplace problems, such as accidents, injuries, absenteeism, turnover, lost productivity, compensation claims, and insurance costs (11). The total cost to the American economy related to substance abuse has been estimated to be more than $144 billion a year, with about 60 percent due to alcohol abuse and 40 percent due to the abuse of other drugs (121). Costs to the economy include costs due to medical care, prevention, law enforcement, and lost productivity, The 1985 National Household Survey on Drug Abuse found that substance-using employees were 3.6 times more likely to have accidents than nonusing employees. They had 2.5

This is the weed that Jack bought. Jack got it from Bobby. Bobby is Jack's best friend. Bobby bought it from his pal at school, Tony. Tony knew this neighborhood connection—Sid or someone. Sid made a deal with a guy downtown who scored it from some dude down south who blew away two cops to get it over the border. Just for Jack.



POT HOOKS YOU UP WITH A WHOLE NEW CIRCLE OF FRIENDS.

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times more absences of 8 days or more. They were three times more likely to be tardy than nonusing employees and were 2.2 times more likely to ask for early dismissal. They requested sick leave three times as much as non using employees. They were five times as likely to file for worker compensation. The total cost of lost productivity due to alcohol and other drug abuse has been estimated at more than $33 billion in 1985 and a little more than $43 billion in 1988 (1 22).

Factors Affecting Individuals in Workplaces

Substance abuse in workplaces can be affected by nonworkplace factors and workplace factors.

Nonworkplace Factors

Early research attributed drinking and other drug problems on the job to factors outside the workplace. Substance abuse was seen as a problem brought to the workplace but not caused by the workplace, and some believed that substance abusers selected workplaces where they could conceal their problems. This view assumed that substance abusers had the knowledge and freedom to choose jobs on this basis, an assumption unlike-1 y to apply to all, given the 1imits of education and work experience among many substance abusers, especially blue-collar workers (11 3). In any case, family and community experiences interact with workplace experiences (2), and workers from families and other subgroups that drink may find that drinking influences their work lives as well.

As noted earlier, drinking problems are more common among those with lower SES, although drinking occurs more frequently among higher SES individuals (31). Workplaces that employ more lower SES employees may therefore be expected to have more alcohol abusers (157).

The acceptance of alcohol and other drugs in the larger society outside the workplace can also influence substance use and abuse in the workplace. This can be seen in the new attitudes in American society toward smoking. Consumers used to be assailed constantly by advertisements presenting smoking in a positive light, but are now more informed about its negative effects on health. As a result, smoking has been banned from many airplane flights, restaurants, stores, and public and private workplaces.

The availability of alcohol in the local community from which a work organization derives its employees can also influence workplace drinking (157). Higher rates of drinking problems exist in communities where alcohol is cheaply and widely available and alcohol outlets remain open for long hours.

Workplace Environment Factors

Several decades ago, researchers distinguished four categories of workplace factors that place employees at risk for excessive drinking (127). They are:

- lack of work visibility,
- absence of job structure,
- lack of social controls that discourage alcohol use, and
- job stress.

A more recent review (157) of risk factors internal to workplace environments identified the following elements:

- alienation and powerlessness,
- work stress,
- structural features of the workplace,
- influence of administrative subcultures,
- poorly implemented intervention programs, and
- union-management conflict.

It has also been suggested that individual factors and perceived work situations may be more important for alcohol use than objective work situations (136). Those with boring and routine jobs, or jobs over which they have little control, may be more likely to drink (3,76). For example, a study of auto factory assembly line workers found that 40 percent drank alcohol at work (129), Other research found a consistent relationship between powerlessness and alcohol use, and no evidence that work experience or social support moderated alcohol use (137).

Workplace subcultures, whether administrative or occupational, may also encourage drinking or the use of other drugs at work. Administrative support for heavy drinking can exist throughout the work organization or can be limited to specific sites or occasions. Subcultures that can support the heavy use of alcohol, but strongly discourage the use of illicit drugs, are found in the military (28, 119). Anecdotal reports suggest that other occupational settings have encouraged the use of cocaine (e.g., entertainment industry). Although available research does not support the conclusion that workplace subcultures are the primary cause of substance abuse, there is evidence that at least alcohol problems vary widely according to occupation (148).

Workplaces can offer protective factors as well. For some, the fact of being employed, with the income and stability and status that employment can convey, may offer protection against substance use and abuse. If unemployment and underemployment are viewed as risk factors, then employment by itself, at a decent wage in a decent job, may offer protection. In addition, the specific characteristics of a workplace can be protective. For example, the risk factors listed above could be viewed as the extremes on a continuum, the other end of which could be expected to offer protection. Thus, work visibility, job structure, manageable stress, worker involvement and empowerment, supportive administrators, well implemented treatment and prevention programs, and union-management harmony could be expected to be protective factors.

Interventions

Two primary ways of dealing with employee substance abuse and health have emerged: traditional employee assistance programs (EAPs), which seek to help employees with identified problems, and health promotion programs, which seek to prevent illness and promote health (56).

Employee Assistance Programs

EAPs help employees with personal problems at the employer's expense, by providing services directly (through the work organization) or indirectly (through a provider in the community) (1 40). In some workplaces, for example, EAPs are located in medical departments, which generally provide emergency medical care and may also provide preventive or rehabilitative care. Medical departments, however, appear to be declining as sites for EAPs (141).

EAPs rely on a strategy of constructive confrontation, which assumes that supervisors or coworkers of substance abusers will help refer them to the EAPs. In addition, workers are encouraged to refer themselves to EAPs for assistance.

A review of what works in fighting substance abuse in the workplace stresses that an employee assistance program is a key to a good workplace program (167). It also recommends a written drug-free workplace policy, management and supervisory training, drug testing in workplaces where appropriate (one example of which is when substance abuse may be dangerous to self or others), and employee education programs focused on substance abuse. Testing may well prevent substance use and abuse in workplaces.

Some studies suggest that EAPs can be cost-effective for business. The Department of Labor has reported that employers generally find that for every dollar invested in an EAP, savings of from $5 to $16 are achieved (167). Other reviews of the limited evaluations of the economic and other benefits of EAPs have found that health care costs and absenteeism, for example, decline after employees have been served by EAPs (178).

However, EAPs have also been criticized in some cases, for their inability to reach those at greatest risk, their incomplete coverage of lower status employees, their failures to identify problem drinkers early enough, their inadequate handling of situation-dependent drinking problems,

and their uncertain effectiveness in rehabilitating problem drinkers (140). The relative lack of EAPs in medium and small workplaces is an important constraint on the ability of EAPs to offer more widespread protection to the employed.

Health Promotion Programs

Health promotion programs seek to prevent illness and promote wellness through behavior change. For example, they provide information and support activities to help individuals increase exercise, quit smoking, change diets, and manage stress and hypertension. There are several advantages to using such general workplace health promotion programs to prevent substance abuse in the context of promoting positive life-style changes for all employees. These include:

- 1ittle or no stigma;
- the use of positive, optimistic approaches;
- ease in selling to employees and generating enthusiasm; and,
- generous corporate financing of health promotion programs (1 03).

The use of health promotion programs to prevent substance abuse can also present problems, however. For example, prevention historically has been one of the lowest priorities for Federal funding (104). When implemented by businesses, health promotion programs may inadequately deal with the needs of a particular work organization's employees, since the programs often come from outside and have not been tailored to fit the needs of a particular group of employees. Decision makers within a workplace may decide on the basis of intuition, whim, or trendiness to buy a health promotion program from the increasing number of purveyors of programs (140). Furthermore, many of the proponents of marketed health promotion programs have failed to adequately evaluate their programs. Unfortunately, this has been particularly true of activities intended to prevent substance abuse.

Environment-Oriented Approaches to Substance Abuse Prevention

A third approach, often associated with Scandinavia, focuses less on changing employee behaviors and more on altering workplace factors that influence worker health. The Swedish Work Environment Fund, established in 1972, supports research, workplace innovations, information dissemination, and training to achieve better working environments. Grants that support occupational health centers and research programs in Sweden are financed through a combination of employer fees, payroll taxes, and government financial assistance.

By contrast, the goal of alcohol policy in the workplace in the United States has for centuries been to change individual drinking behavior (1). Researchers have recently begun to focus on how the workplace environment influences problem drinking. The Harvard School of Public Health, jointly funded by the National Institute on Alcohol Abuse and Alcoholism and the Robert Wood Johnson Foundation, is surveying thousands of managers and work groups in up to 10 large multinational corporations (17 1). The study will determine corporate and work site patterns of drinking, levels of work site drinking problems as they relate to attitudes and practices of management, how corporate culture affects managerial behavior and drinking problems in the workplace, and what role the work group plays in promoting or preventing problem drinking.

RECREATIONAL SETTINGS

Recreational and other developmental activities and settings may also contribute to the prevention of substance use and abuse, or by their absence increase the risk. Examples of such recreational and other developmental activities and settings include Boys and Girls Clubs, Boy and Girl Scouts, organized sports, cultural activities, and local park and recreation department programs.

HIGH ON THE CORPORATE LADDER

Coping with the pressure of corporate life often means **turning to illegal drugs. Just** because peo**le wear white collars doesn't** mean th**at they're immune to the lure of the likes of heroin or cocaine.**

Whether they're high on the corporate ladder or somewhere near the bottom, drug abusers need your help now, before it's too late. Look. Listen, Drug abuse is everywhere,

Partnership **for a Drug-Free America**

Organized Activities and Drug Abuse

Research on the impact of organized youth activities on substance use and abuse is limited, and only a few studies have addressed the issue directly, while others have addressed it more indirectly.

One study (which relied extensively on reports from employees of Boys and Girls Clubs) found that public housing developments served by Clubs had 22 percent less drug activity than developments not served by Clubs. The presence of crack in particular was 25 percent lower, and even lower in developments served by new Clubs with SMART Moves, a substance abuse prevention program (1 33).

A more extensive investigation has been conducted by the Search Institute, which has surveyed 180,000 6th through 12th grade youth in 430 school districts since 1988. Analysis of the data found that as developmental assets increased (including involvement in music, school team sports, nonsport school-based cocurricular activities, nonschool clubs or organizations, and churches) at-risk behaviors decreased, including the use of alcohol, tobacco, and illicit drugs (12). Specifically, the correlations:

- tend to be small;
- are strongest for tobacco use and weakest for alcohol use; and,
- are slightly higher for church involvement than for other activities.

Involvement in youth programs and activities has been found to be associated with fewer at-risk behaviors among youth. One study found that higher levels of four youth assets (perceived positive school climate, family support, involvement in structured youth activities, and involvement in church or synagogue) were associated with lower levels of 20 at-risk indicators, contained mainly in eight at-risk domains (alcohol, tobacco, illicit drugs, sexuality, depression/suicide, antisocial behavior, school, and vehicle safety) (12). High school students who listed no assets, for example, reported an average of 5.6 at-risk indicators, while students listing all 4 assets reported only 1.7 at-risk indicators.

A study of different communities found that 55 percent of the youth in the healthier communities (defined by fewer at-risk behaviors among youth) were involved in structured activities, whereas only 39 percent of the youth in the least healthy communities were involved in such activities (19).

Qualitative assessments across prevention disciplines support these findings. For example, although a review and analysis of delinquency, adolescent pregnancy, substance abuse, and school failure and dropout prevention programs did not directly investigate connections between youth development programs and substance abuse prevention, its authors concluded that the elements in youth development organizations can play a critical role in preventing each of these problem behaviors (48).

The Carnegie Council on Adolescent Development has identified several successful prevention efforts launched by national youth-serving organizations, including the adolescent pregnancy efforts of the Association of Junior Leagues and of Girls, Inc., and found that participation in such programs was associated with fewer at-risk behaviors (32). The Carnegie Council's Task Force on Youth Development and Community Programs concluded that, taken together, current social science theory and field evaluations provide a solid rationale for strengthening and expanding the role of community-based programs in promoting healthy adolescent development, since unsupervised after-school hours represent a period of significant risk, with young adolescents standing a greater chance of engaging in substance abuse.

Another study tested whether inactivity or boredom was associated with substance abuse. It compared adolescents who had been clinically diagnosed as substance abusers with a comparison group of nonsubstance abusers, and found that the substance abusers experienced their leisure activities as more boring, even though they had partici-

pated in more leisure activities (including such activities as going to concerts and going for a drive). Available leisure activities may, for some youth, fail to satisfy "their need for optimal arousal," leaving them more vulnerable to the appeal of drugs (78).

Thus, being active does not by itself protect against substance abuse. Some activities, such as those that are unstructured and unsupervised, may even increase the risks of substance use and abuse through association with a wider range of peers, some of whom are using substances. In addition, activities perceived as boring may not protect against substance use and abuse. More research is needed, to clarify the aspects of recreational and other leisure activities that may protect against substance use and abuse. Research might profitably focus on whether activities that are supervised, structured, drug-free, empowering, skills-building, self-esteem-promoting, active, shared, and nonboring (or some combination of those) are associated with lower levels of substance use and abuse.

Elements of Notable Programs

Several of the most important elements of notable substance abuse prevention programs are provided by youth development programs as well. These include:

- **Promoting social and life skills.** Programs that rely exclusively on transmitting information about the health, legal, and social risks of substance use and abuse are generally ineffective (79). If, as the author of a recent longitudinal study contends, substance use is a symptom rather than a cause of personal and social maladjustment, promoting social and psychological well-being may help prevent substance abuse (66). Many alcohol and other drug prevention programs focus on the development of social and life skills, as a way to help youth understand their emotions, control their anger, curb aggressiveness, and presumably reduce their inclination to turn to substances (66,166).
- **Strengthening families.** Increasingly, alcohol and other drug prevention programs are recognizing and addressing family factors. Youth development organizations afford opportunities for involving parents in recreational and other nonschool, nonfamily activities.
- **Promoting healthy peer interactions.** Several studies have shown the value of using peers as role models in prevention programs. One study conducted a meta-analysis of 143 adolescent drug prevention programs and collapsed prevention programs into 5 strategies or types: knowledge only, affective (i.e., addressing feelings) only, peer programs, knowledge plus affective, and alternatives. Peer programs that highlight peer influences and emphasize skill building were found to be the most successful (156). Peers are often the best positioned to help others build resistance skills and bring about significant results in reducing substance use, as compared to teachers or other adults. Peer counseling and student assistance programs, for example, offer unique opportunities for youth to cope with difficult issues and develop skills to resist peer pressure (33).
- **Indirect and participatory approaches to substance use.** Substance prevention programs are more likely to be effective if they develop creative ways to reach and connect with their participants. Many programs incorporate lessons concerning substance use into activities such as games, theatrical performances, creative arts, and sports. Some programs avoid stating in their names that they are focusing on substance use prevention, and in this way often attract more youth and preclude them from feeling stigmatized (161). Because youth spend so much time in school, where didactic, lecturing approaches so often predominate, these approaches may well be less effective in nonschool activities. GAO has recommended that programs engage youth in activities that are more motivational and participatory, such as support groups, dramatic productions, leadership training, and role-playing (161).
- **Alternative activities.** Communities are beginning to create healthy, substance-free alternative activities, such as teen centers or drug-free parties, for youth who may feel there

is nothing else to do. This alternatives approach grows from the idea that youth who turn to substances to meet certain social and psychological needs can meet those needs in more positive and healthy ways without chemicals. In its guide book, *Prevention Plus III,* CSAP stresses the importance of incentives for youth to participate in such alternative activities. At a minimum, activities should reflect the interests and preferences of the youth involved. A IO-year study with over 500 subjects found that the largest percentage (67 percent) of assuredly recovered substance abusers, defined as those who have been clean for five years, used alternative activities to cope with or improve their moods (169). However, although it remains a promising strategy, many agree that more substantial research is needed.

The elements of notable programs suggest that youth development organizations may be able to play a greater role in the prevention of substance abuse. First, they can provide specific information about substances and training in refusal skills. Second, they can address life skills development, emotional issues, and academic remediation. Further, they can involve both youth and their families, as well as peers, in settings for collaborative, substance-free interactions. Research has shown the importance of building supportive communities through such networks of social support that can diminish substance use and abuse and promote healthy youth development (1 4,19,133).

PLANNING, IMPLEMENTING, AND EVALUATING COMMUNITY-WIDE PROGRAMS

If substance abuse and addiction problems in a particular community affect individuals via multiple risk and protective factors interacting in multiple settings, then efforts to prevent these problems may require multipronged efforts involving schools, parents, media messages, and other community resources (116). While it is possible that an assessment of problems may be carried out by relatively few individuals, it is extremely unlikely that the planning, implementation, and evaluation of community-wide efforts can be achieved without participation of residents and leaders throughout the community. Widespread coordination and cooperation are intrinsic to community-wide efforts. To help achieve such community-wide coordination and cooperation, several different types of community coalitions have been created.

The CSAP has studied the ability of 7 pilot test communities, under Community Partnership grants, to gather information on 15 community-wide indicators of alcohol and other drug abuse (see table 8-3). Some of these indicators are directly related to and measure the extent of substance abuse and addiction among subpopulations in a community (e. g., number of drug positive urine samples from pregnant women at time of delivery), Some of the indicators measure the extent of behaviors or outcomes that maybe directly related to substance abuse (e.g., number of single vehicle nighttime accidents and number of deaths due to alcohol and other drugs). Some of the CSAP indicators relate to community activity settings, such as workplaces and schools.

CSAP has recently supported, through the Community Partnership program and the High-Risk Youth program, the use of nonquantitative techniques to gain insights into substance abuse and addiction and related problems in communities. This information can be garnered by ethnographers and citizen informants, who can report on the values, attitudes, purposes, behaviors, and experiences of individuals in the subcultures of communities.

The Robert Wood Johnson Foundation has funded 13 community coalitions in its ‘*Fighting Back” program to reduce substance abuse and addiction. About 600 coalitions now belong to a national organization, Community Anti-Drug Coalitions of America (CADCA). Some coalitions have been formed to address other health and social issues, including the ASSIST and COMMIT community tobacco control programs, funded by the National Institutes of Health, and the Planned Approach to Community Health (PATCH) program, funded by the Centers for Dis-

TABLE 8–3: Community–Wide Indicators of Alcohol and Other Drug Abuse for Pilot Testing in Community Partnerships Funded by CSAP

Public Safety

1. Number of single vehicle nighttime accidents,
2. Number of drug positive from urine samples of arrestees (e g , based on Drug Use Forecasting (DUF) System),
3. Number of arrests for drug possession,
4. Cost and purity of Illegal street drugs.

Physical and Mental Health

5. Number of drug positives from urine samples of pregnant women at time of delivery.
6. Number of alcohol -and-other-drug-related emergency room episodes (e. g., based on Drug Abuse Warning Network (DAWN)).
7. Number of alcohol- and other drug-related deaths (e.g., based on DAWN),
8. Number of individuals on waiting lists for and admissions to inpatient and outpatient alcohol and other drug program services,
9. Number of referrals and admissions to mental health centers for alcohol and other drug problems.
10. Incidence of alcohol- and other drug-related outcomes (e g , fetal alcohol syndrome, positive drug toxicology).
11. Incidence of drug-related sexually transmitted diseases, including HIV transmission of AIDS cases.
12. Number of alcohol- and other drug-related medical conditions (e. g., cirrhosis of the liver, hepatitis),

Workplace

13. **Number of drug positives from urine samples of job applicants and** employees

Consumption

14. Aggregate per capita consumption of alcohol, based on alcohol tax revenue data,

Education

15. **Existing school surveys of alcohol and other drug use and attitudes.**

SOURCE: Community Partnership Prevention Program National Evaluation, Community-Wide Indicators of Alcohol and Other Drug Abuse Pilot Test Report (Draft), Center for Substance Abuse Prevention, 1992

ease Control and Prevention to encourage local coalitions for community health planning and implementation (29). HUD now has funds to support Community Coalitions Against Crime, which also address substance abuse and addiction. And CSAP has supported numerous activities conducted by approximately 250 coalitions through its Community Partnership program (see table 8-4).

A recent review of some of the Community Partnerships revealed the wide range of activities they have so far implemented, including general prevention programs, public education, alternative activities, community organizing and empowerment, advocacy for policy change, and other community activities.

Although coalitions have not been extensively evaluated as yet, and although the evaluations that are now in process will not produce outcome results for several years, there is reason to believe that community coalitions offer promise for community-wide efforts to prevent substance abuse and addiction. First, as documented by this report, the factors contributing to substance abuse and addiction are multiple and interactive. Second, these factors interact in subcultures and community activity settings that can encourage or inhibit substance abuse and addiction and are widely dispersed. Thus, especially in communities severely impacted by these problems, multiple efforts addressing multiple factors in multiple settings may be required. A recent report from the General Accounting Office concluded that "preliminary research results indicated that a community-based approach may hold promise in preventing drug use," and went on to emphasize the need for comprehensive evaluations of such efforts (162).

Community coalitions could make use of the framework in this report to develop plans for preventive interventions addressing targeted populations in selected community activity settings. Building on a systematic quantitative and nonquantitative assessment of needs, a coalition could identify optional preventive interventions that address selected populations and settings, and then phase them in as resources permit. However, some community coalitions may need additional support and technical assistance to help them resolve conflicts, form consensus on goals and plans, and sustain cooperative, coordinated efforts

TABLE 8–4: Selected Community Partnership Activities, 1992

Prevention Programs
- Program for at-risk youth of single parents
- Parent courses
- Youth retreat
- Employee assistance programs for local businesses
- School-based prevention program
- Street-based prevention program

Public Education
- Radio talk show
- Prevention library
- Newspaper articles
- Anti-drug media campaigns
- Presentations to businesses
- Information booth at car show
- Prevention program guide
- Brochures
- Education for health care professionals
- Public awareness days
- Television forum
- Computerized database of prevention materials
- Resource center
- Newsletter
- Metrobus poster campaign

Alternative Activities
- Family oriented sports
- Alcohol-free fiesta
- Youth centers
- Basketball program
- Drug-free dance
- Drug-free cultural activities
- Boxing and karate lessons
- Drug-free concerts
- Drug-free clubs for youth
- Drug-free graduation night for youth
- Drug-free New Year's Eve party for youth

Community Organizing and Empowerment
- **Community center fund-raising**
- **Community conferences**
- **Blueprint for community action**
- **Technical assistance to develop community association**
- **Neighborhood cleanups**
- **Empowering senior** citizens to work with community
- Community days
- Youth council
- Town meeting
- Pot luck dinner for community

Advocacy for Policy change
- **Working with other Partnerships to lobby State legislature**
- **Briefings to politicians on substance abuse issues and programs**
- Position paper opposing drug legalization

Other Community Activities
- **Workshop on farm issues and stress**
- **Program** to employ unemployed unskilled adults
- Inmate treatment program
- Youth mediation training for nonviolence in schools
- HIV training in school
- Rites of Passage Program for black youth
- Master Program to employ seniors
- Workshop for pregnant women and teens
- Youth mentor program

SOURCE National Evaluation of the Community Partnership Demonstration Program, Second Annual Report, Center for Substance Abuse Prevention, 1992

that are subject to more rigorous evaluations and midcourse corrections. Each community coalition needs to take a critical look at what works and what does not work, and needs to be flexible enough to try promising and proven analytical and programmatic technologies, even if they are somewhat new to the coalition.

SUMMARY

This chapter has reviewed research on factors and interventions relevant to the onset and prevention of substance use, abuse, and addiction in the four principal community activity settings—homes and families, schools and peers, workplaces, and recreational and other community settings.

Research indicates that families may influence whether family members, especially (but not limited to) the young, initiate substance use and progress to abuse and dependency, and can be the target of a wide range of increasingly tested preventive interventions that can help family members resist the use of substances. Similarly, schools, especial-

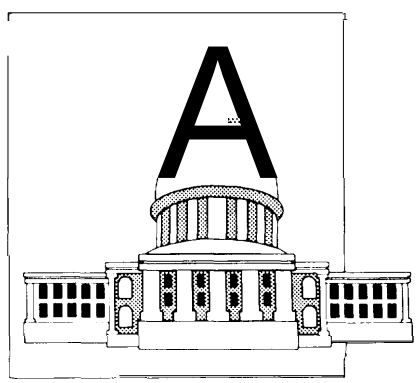
ly through peer group norms and behaviors related to substance use, can also be important locations for the onset of substance use (including alcohol use) and for preventive interventions, especially those that focus on social influences, including peers. Factors in workplaces, although less studied, can also contribute to and protect against substance use and abuse, and workplace interventions that focus on individuals and environments provide opportunities for prevention. Finally, an emerging literature on the role of recreational settings and activities, especially for youth, suggests that the availability of attractive and compelling substance-free activities can play a role in dissuading youth from becoming heavily involved in the use and abuse of substances.

Policy Options 9

Issues related to substance abuse and addiction have long occupied the attention of the American public. Congress has: authorized a multitude of federal programs aimed at reducing or preventing the supply and demand of illicit drugs and to regulate the availability of illicit substances, appropriated billions of dollars each year to federal agencies, provided oversight of federal programs, and passed broad-based legislation to coordinate programs as part of the war on drugs.

Congress faces several fundamental difficulties in addressing the causes of substance abuse and addiction:

- **No scientific consensus exists as to what is the driving cause of substance abuse and addiction.** A range of risk and protective factors have been associated with drug use, abuse, and addiction.
- **Federal antidrug efforts, though coordinated by the White House Office of National Drug Control Policy (ONDCP), are spread among many federal agencies, whose authorization and appropriations are the subject of action by numerous congressional committees and subcommittees.** ONDCP efforts in drug demand reduction efforts alone involved the efforts of federal agencies across at least 11 Cabinet-level departments. This makes coordinated legislative action difficult to achieve.
- **The federal budget deficit is an obstacle to the creation of new domestic programs that target known risk and protective factors in individuals and communities. The** framework and literature reviews presented in this report make clear that



multiple factors in individuals, groups, and substance abuse and addiction can arise and be influenced by communities. Thus, effective intervention requires prevention practitioners to select from a variety of options, so they can target the specific factors that are especially important for the particular populations and communities they are addressing. This does not mean that everything must be done at once nor that everything be known in advance of taking action. To the contrary, policy makers and practitioners can take small steps at a time, and then, as resources and new knowledge permit, take additional steps that address a fuller range of factors and contexts in greater depth.

- **Current drug prevention programs lack scientifically accepted standards for determining their success or failure.** While federal supply-side efforts yield hard data (e.g., amount of illicit drugs confiscated, number of persons incarcerated), it is much more difficult to demonstrate and quantify the impact of a domestic program designed, in part or in whole, to prevent drug abuse. Whatever methods are developed, tested, and incorporated into prevention programs, a critical component of success is careful, rigorous evaluation. Answering "what works?" is essential in making advances in preventing substance abuse.

This chapter addresses some of the policy issues brought to the Office of Technology Assessment (OTA's) attention during the course of this assessment, and possible options for congressional action. **The issues and options are broken into four broad categories: federal focus and prevention program structure, research needs, community activity settings, and availability.** Given the broad nature of federal antidrug efforts, many important issues relating to federal antidrug efforts remain beyond the scope of this report. Such topics include drug treatment, interdiction and enforcement, and drug legalization.

The order in which the issues and options are presented does not imply priority. Moreover, the options presented under each policy question are intended as a short menu from which Congress can choose one or more options for consideration and implementation, and they are not necessarily mutually exclusive.

FEDERAL FOCUS AND PREVENTION PROGRAM STRUCTURE

Supply vs. Demand Reduction

The federal substance abuse control policy has as its primary focus the eradication of the supply of drugs. The federal government currently spends over $12 billion annually on antidrug efforts, with approximately two-thirds of this amount supporting drug interdiction and law enforcement activities, and the remainder supporting demand-side activities, such as drug treatment, research, and prevention programs. While ONDCP'S most recent National Drug Control Strategy argued for a slightly increased percentage of funds for demand-side reduction, the larger percentage of funds remain devoted to supply-side efforts. Congress could decide that existing levels of effort and program approaches in interdiction may need to be continued for a longer period of time before they can succeed in reducing the production, distribution, and local availability of illicit substances. Congress could direct that interdiction efforts, and the balance between supply and demand efforts, continue on the same track.

If Congress decided to increase federal efforts in demand reduction efforts, it could adopt any of three methods: 1) increase appropriations for treatment and prevention programs; 2) redirect some of the interdiction funds to increase support for treatment and prevention programs; or 3) require that assets forfeited in drug seizures be increasingly used to support treatment and prevention programs. If Congress chose to simply increase appropriations for additional treatment and prevention programs, this option would require raising the current level of federal spending for drug control efforts at a time when the federal deficit is a key concern. Since costly interdiction and incarceration programs have not eliminated either the supply of illicit substances or the demand for and use of such substances, Congress could decide to increase appropriations for treatment and pre-

vention programs by reallocating funds currently spent in drug interdiction and law enforcement activities; this would mean a drop in supply-side efforts such as drug interdiction and law enforcement activities. The reallocation of assets forfeited in drug seizures to treatment and prevention programs, if done together with closer coordination of local antidrug efforts among law enforcement and treatment and prevention practitioners, may be an attractive small step. Congress could direct that ONDCP monitor the reallocation of such assets, to ensure the flow of funds to programs that directly focus on substance abuse and addiction and, programs that do not directly address substance abuse and addiction but that target risk and protective factors known to be associated with abuse and addiction.

Many stakeholders agree that the federal antidrug effort should be more focused on treatment and prevention. Widespread disagreement exists, however, as to whether such additional treatment and prevention efforts should be created at the expense of, or in addition to, current supply-side efforts.

Structure of ONDCP

Since its creation in 1988, ONDCP has served as the most visible federal entity in the war on drugs. The Director, the so-called drug czar, has the opportunity to galvanize public attention on federal ant i drug efforts, and to propose and advocate policies within the White House. ONDCP'S effectiveness is limited, however, both in its statute and through its operation as a White House office. Congress could choose to reauthorize ONDCP, and in so doing maintain or alter its mission and authority; or allow ONDCP to expire.

If Congress chooses to reauthorize ONDCP, a number of options exist for altering its mission. Congress could:

- **Direct ONDCP to address the full range of the most harmful abusable substances, including alcohol, tobacco, and inhalants.** Although federally funded prevention programs address the range of abusable substances, the statute creating ONDCP emphasized illicit substances. As a result, ONDCP has historically provided limited attention on abusable substances that have been associated with higher levels of death and injury than illicit drugs. More recently, ONDCP increased the focus in its National Drug Control Strategy on the illicit use of alcohol and tobacco by minors because of the extensive damage to the health and safety of minors, resulting from the use and abuse of these substances. This approach could be enhanced through congressional authorization.
- **Alter ONDCP'S leadership structure.** ONDCP by statute has a Deputy Director of Supply Reduction and a Deputy Director for Demand Reduction. This structure has, in part, resulted in an ongoing public policy debate regarding the overall federal focus on antidrug efforts, with supply-side and demand-side reduction efforts seen by some as philosophically incompatible (see discussion on supply versus demand reduction earlier in this chapter). By creating an alternative structure, ONDCP maybe encouraged to adopt programs that more closely link various elements of the antidrug strategy (e.g., a focus on drug availability could link current supply-side elements that target physical availability of a drug with current demand-side efforts that focus on economic and social availability, as discussed in chapter 4). Despite the advantages that may result from a new organizational structure, the simplicity of the current structure makes it easier to provide a sharper focus on supply and demand elements of the National Drug Control Strategy.
- **Give ONDCP increased authority over federal agency antidrug programs.** Although ONDCP is charged with leading a war on drugs, its authority is limited to a coordinating function. Congress could provide the Director of ONDCP with specific authority over certain elements of various federal programs, or with additional authority over federal agency budget proposals. Such actions would give the drug czar more substantive authority to direct the war on drugs, but would likely be viewed by

some federal agencies as an unwarranted intrusion in agency matters.

- **Mandate the size of ONDCP.** Because it is part of the Executive Office of the President, ONDCP is subject to increased political manipulation by each administration. Recently, for example, ONDCP took the largest personnel cut of any White House office to meet President Clinton's pledge of a 25 percent reduction in overall size of White House staff. While mandating a specific size for ONDCP might lead to increased effectiveness for the office, it would hamper White House efforts to control staff size.

Alternatively, Congress could **allow the authorization for ONDCP to expire.** While ONDCP has produced National Drug Control Strategies that summarize and set policy for federal efforts, the office lacks the authority to shape the antidrug policies of the federal agencies. Coordination of antidrug efforts is difficult at best when the number of relevant agencies is so large; since antidrug policy involves many federal agencies, it might make sense to disband ONDCP and rely on efforts by diverse federal agencies to continue to address the many aspects of the drug problem. Recent reductions in the size of the ONDCP staff, as a part of the down-sizing of the White House staff, could make this an opportune time to eliminate the office altogether. Terminating ONDCP would, however, be viewed by many as federal abdication of the war on drugs.

Structure of Federal Substance Abuse Prevention Programs

Federal efforts supporting substance abuse prevention programs are housed at a number of agencies. Congress recently reorganized the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), splitting service-based components into the Substance Abuse and Mental Health Services Administration (SAMHSA) and research-based components—the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute on Drug Abuse (NIDA), and the National Institute on Mental Health (NIMH)—into the National Institutes of Health (NIH). More recently, the Centers for Disease Control (CDC) has been renamed the Centers for Disease Control and Prevention (CDCP), which has already expanded its title and mission to include prevention. Congress could **maintain the current structure if it determines that substance abuse is a problem that has many aspects and deserves to be addressed by many agencies and in many settings.**

If Congress decided to create a more centralized structure, it could enact legislation designating a single federal entity as the chief agency for prevention efforts, or merge the components of various agencies under one federal roof. Possibilities include:

- **Merging NIDA and NIAAA into a single National Institute on Substance Abuse and Addiction.** The use of multiple substances (including alcohol, tobacco, marijuana, cocaine, and heroin) is increasingly reported by researchers and practitioners. Indeed, the gateway theory or hypothesis focuses on the progression in the use of substances, beginning with alcohol and tobacco (which are illegal for youth, but legal for adults) and moving to marijuana, cocaine, and heroin. Since clinicians and researchers have increasingly commented on the progression in substance use and on the co-occurrence of the use of multiple substances, the separation of the major federal research agencies into an alcohol agency (NIAAA) and a drug agency (NIDA) is more and more inconsistent with the shape of the problem. The Center for Substance Abuse Prevention (CSAP) is an integrated substance abuse agency that explicitly focuses on alcohol, tobacco, and other drugs, and all state alcohol and drug abuse agencies are now integrated or located in the same place. To facilitate more integrated and coherent research on the range of abusable substances, NIDA and NIAAA could be combined into a national institute on substance abuse and addiction. Such a merger would further integrate the federal research efforts in substance

abuse, but might be seen by some as downplaying the emphasis given to illicit substances.

- **Place CSAP in CDCP or in the Health Resources and Services Administration (HRSA).** CDCP could give the substance abuse prevention field a solid base in the health and medical sciences, especially in the tracking and prevention of diseases. HRSA could give CSAP a broader health care environment to work within, which includes Community Health Centers and the National Health Service Corps. One disadvantage to the merging of CSAP into either of these other health agencies is that it would emphasize the medical aspects and interventions of drug prevention and downplay the many nonmedical factors and interventions that are important in the onset of substance use and abuse. Merger would also present problems of moving people—CSAP is headquartered in Rockville, Maryland, while CDCP is headquartered in Atlanta, Georgia—and threaten the loss of identity that some proponents of CSAP say is found in an agency that solely addresses substance abuse and prevention. However, the fragmentation of the federal effort on substance abuse prevention has been viewed by some as extreme and counterproductive, and the efforts of ONDCP have not succeeded in achieving coordination across departments.
- **Merge federal substance abuse prevention efforts into a single agency, such as CSAP.** CSAP has been working collaboratively with the staff in many other federal agencies, and would be seen as a natural leader for this effort. In addition, its recent efforts to begin to develop standards of practice for substance abuse and addiction prevention programs could be continued and more effectively infused into the components of programs currently in other agencies and departments.

Evaluation of Prevention Programs

Current drug prevention programs lack scientifically y accepted standards for determining their success or failure. Most evaluations focus on the processes used in formulating and implementing a prevention program (e.g., who was involved, what type of program was used) and outcome evaluation (e.g., how man y people were p art of the program, how the program was replicated). Congress could **allow the current level of process and outcome evaluation related to substance abuse prevention programs to continue.**

If it chose to improve the quality of program evaluation, Congress could **direct NIDA and NIAAA, or CSAP to design, lead, and support a multiyear national process (involving representatives of other federal agencies and of outside organizations) to forge consensus on standardized definitions and outcome measures, using technical reviews, consensus-forming techniques, and technical assistance monographs.** These definitions and measures could include substance use, heavy drinking, substance abuse, substance addiction or dependency. and related behavioral problems such as school truancy, unemployment, delinquent and criminal behaviors, and the like. CSAP, NIDA, NIAAA, the Department of Education (DOE), and other federal agencies could be required to increase funding and technical assistance for process and outcome evaluations through grants and contracts. CSAP could focus on process evaluations that may assist program managers throughout the course of a program. NIDA and NIAA could focus on outcome evaluations that are more rigorously designed and conducted by individuals who are independent of the programs being evaluated. DoE could require both process and outcome evaluations by states and by schools, using Drug-Free School monies. NIDA, NIAAA, or CSAP could be directed to provide incentives for researchers and programs to participate in a national program database, using consistent definitions and including data from multiple evaluations. The creation of such a database would allow researchers to extend their own analyses by tapping into data from other program sites and populations that have used consistent definitions and measures.

States could be required by legislation to use a portion of their 20 percent prevention set-

asides under the Alcohol and Drug Abuse Block Grant program and a portion of their Drug-Free Schools funds for evaluation of substance abuse prevention programs. Since evaluations of prevention programs can be expensive, Congress could consider increasing block grant funding levels to allow increases in evaluation studies without requiring decreases in programs. If such an option were enacted, Congress could mandate that evaluations be conducted by independent bodies, such as university-based researchers, rather than by state government agencies that have vested interests in demonstrating program effectiveness.

RESEARCH NEEDS

Data Collection

The National Household Survey and the National Survey of High School Seniors have developed credibility over the years for their regular reporting of substance use in households and high schools. **These surveys could be allowed to continue, with no substantial changes in the cost, frequency of data collection, focus on target groups, analysis, and sharing of the database.**

Because of the methodology employed, national surveys miss or underreport various populations. Much of the data now collected focuses on substance use (e.g., any use within the past 30 days or anytime in a lifetime), rather than on more intense substance abuse and addiction. In addition, questions are substance-specific, and less oriented to the use and abuse of multiple substances. Such polydrug users and abusers are increasingly being identified by researchers and clinicians. While substance use is a key precondition to later abuse and addiction, most individuals who use illicit substances do not go on to addiction. Thus, an important question for the development of prevention policies and programs is: What are the characteristics of individuals who abuse and become addicted to substances, and how do they make the transition from use to abuse and addiction?

If Congress felt that current data do not provide adequate information, it could **direct that the Household and High School Surveys be conducted less intensely or less frequently. The expense** of these surveys, especially the National Household Survey, is high. In 1992, the High School Survey cost about $3 million, and the Household Survey cost over $12 million. Spending could be reduced if the survey data were compiled less intensely (e.g., with fewer questions or from a smaller sample) or less frequently. Alternatively, Congress could **direct NIDA to develop and support survey methodology that reaches populations missed by current surveys** (notably the homeless, school dropouts, and residents of some inner-city and rural areas), or through legislation, **create a mechanism, comparable to the release of economic indicators, for the regular and nonpolitical release of survey data.** Data could then be released through a well-defined process that includes careful and timely technical reviews for compliance with high standards of data collection and analysis, rather than being subjected to bureaucratic or political reviews that may delay the release of or bias the data.

Individual Risk and Protective Factors

A substantial body of research has been developed regarding potential risk and protective factors for children and adolescents. A variety of theories has been developed concerning how many and which risk factors increase the chances for a child or adolescent to first use alcohol or other drugs. Historically, one of the flaws with much of the risk and protective factor research has been that studies analyzed one factor in isolation from all others. Increasingly though, researchers are examining a wider variety of factors among different populations, as well as using more complex data analysis procedures. Even so, sophisticated multifactor research studies are still in the minority.

While a substantial amount of risk and protective factor research has focused on children and adolescents, not as much is known about factors among other populations. Recent research has led to interest in the possibility of further analyses in selected populations and/or selected risk or protective factors. Some examples:

- **Adults.** Additional research in this area could result in learning more about factors associated with long-term drug abuse and addiction as well as the importance of factors more often found in adult populations (e.g., effects of aging, death of a spouse or child, divorce). Data from a recent National Household Survey on Drug Abuse show that individuals aged 18 to 25, and 26 to 34, respectively, have the two highest reported rates for heavy drinking and smoking, past month use of cocaine, crack, marijuana and hashish, or psychotherapeutic drugs. Additionally, gender, racial, and ethnic substance use differences appear within the adult population. Some research has indicated that women who drink heavily do so several years later than men, although the reasons for this remain unclear. Researchers also indicate that black men who drink heavily, do so in their late twenties and early thirties, in contrast to white men whose drinking peaks at age 15 to early twenties. Increased research on the adult population could be useful in developing appropriate substance abuse prevention and treatment programs for adults.
- **Race and Ethnicity.** The biological and genetic substance abuse studies completed on different racial and ethnic groups have been few in number, mostly limited to alcohol, and inconclusive. While race and ethnicity have not been shown to be biological or genetic predictors for substance use, abuse, or addiction, certain risk factors appear to be unique for specific cultures. To date, however, the racial and ethnic categories used in many large-scale studies are so broad that many researchers consider them useless. Increased federal funding for studies of specific subpopulations living in geographically different areas (e.g., urban versus rural, reservation versus nonreservation) will provide much needed baseline data on which to plan, implement, and evaluate appropriate substance abuse services.
- **Poverty.** Disagreement exists on the appropriate definition of poverty and its exact relationship to substance abuse. While few researchers deny that the daily stresses associated with living in chronic poverty probably contribute to substance abuse, poverty is certainly not the only factor, or perhaps even the most important. There are after all, more individuals living in poverty who do not abuse substances than who do. However, the consequences of substance abuse appear to be worse in chronically poor areas. Additional research to study the complex relationship between poverty and substance abuse could provide substance abuse practitioners with a framework from which to build programs most suitable for (he special needs of chronically poor areas.

Congress can, through its reauthorization and oversight powers, **monitor the amount and scope of risk and protective factor research that is being conducted, and redirect federal efforts toward more extensive multifactor research and analysis, as appropriate.** Such focus could include factors other than substance usc that may contribute to later abuse and addiction, such as other problem behaviors, availability, marketing, psychological factors, social norms in communities, and subcultures. The increased use of ethnographers as part of a multidisciplinary drug abuse prevention research teams could also be encouraged.

Biomedical Research

Biomedical research on substance abuse helps explain the acute and chronic biological effects of substances on the brain and other organs, and also points to appropriate short- and long-term medical treatments for substance abuse. This in turn helps treatment providers understand treatment outcomes and relapse rates for long-term abusers. Most federally supported biomedical research is administered by the 17 institutes that comprise the NIH. With the passage of the Alcohol, Drug Abuse, and Mental Health Administration Reorganization Act of 1992 (Public Law 102-321), NIDA and the NIAAA were moved to NIH. Research targeting substance use, abuse, and addiction is supported primarily by these two institutes, whose combined appropriation level ($580.7 mil-

lion in fiscal year 1994) is approximately 5 percent of the NIH total.

Congress has historically increased annual appropriations for biomedical research at NIH; if Congress continues this trend, both NIDA and NIAAA annual appropriations will rise, although not at the dramatic levels many scientists would like. If Congress were to decide that substance abuse and addiction should command more of the nation's biomedical research budget, it could substantially raise appropriation levels for NIDA and NIAAA. Such an action would allow increased levels of research in a number of areas including: genetics; drug development; identification of biological factors related to transitions from casual drug use to abuse, addiction, and dependence; the pharmacology of multiple drug use; environmental factors and their effect on individual biological susceptibility; and the biological effects of drug use and abuse on the development of children and adolescents. Given budget realities, however, an increase in the funding levels available for basic biomedical research could mean a decrease somewhere else.

A number of budgetary pressures have recently slowed robust NIH budget growth, including the need to fund disease-specific research (e.g., acquired immunodeficiency syndrome), indirect costs of research, and the increasing pressure to limit discretionary spending. Some scientists identify stable budget growth—as opposed to sporadic increases targeted at particular topics—as most important for continued progress in research. In fiscal year 1994, both NIDA and NIAAA received a 5.2 percent increase in appropriations, following an Administration request that would have raised NIDA's appropriation by less than 1 percent, and decreased NIAAA's appropriation by 1.6 percent. Fluctuations in appropriation levels could impede the development of scientific advances that are necessary to the creation of new medications and therapies.

The Congressional Budget Office (CBO), in its March 1994 report to Congress, *Reducing the Deficit: Spending and Revenue Options,* identified **a reduction in funding for NIH research** as one of nearly 200 policy options. As noted by CBO, reduction in NIH funding could have adverse effects on biomedical research and might cause some researchers to leave the field. NIH cannot currently fund the majority of grants it approves; in addition, funding is insufficient to support some important areas of research. According to a 1992 General Accounting Office report on *Drug Abuse Research: Federal Funding and Future Needs,* antidrug research appears now to have a very modest role, with only about 4 percent of total drug strategy spending devoted to research and development.

COMMUNITY ACTIVITY SETTINGS

Substance abuse and addiction occur in communities around our Nation. Those who believe that drug abuse and addiction are closely related to social and economic problems argue that antidrug programs should more directly address the risk and protective factors that have been identified by researchers. Many prevention program providers also argue that the most successful programs are those that are more comprehensive in scope (i.e., tailored to address the many community settings in which drug abuse can occur) rather than addressing one or two risk factors in isolation.

In conducting this assessment, OTA surveyed literatures addressing substance abuse and addiction in various community settings—families and homes, schools and peers, workplaces, and recreational settings (see ch. 8). The literature reviews presented in this report make clear that substance abuse and addiction can arise and be influenced by multiple factors in individuals, groups, and communities. Thus, effective intervention ideally should be comprehensive, employing multiple services and addressing the many factors that cause drug abuse and addiction; and community-based, sensitive to and directed at the needs of the local population.

Still, three problems arise in assessing policy options related to community settings:

1. There is the inherent difficulty in drawing a link between many social services and their effect on drug abuse and addiction.

2. Since broad-based social services are provided through the work of many federal agencies, further analysis (e.g., by ONDCP or a congressionally enacted national commission) could identify which federal agencies are best suited to implement the variety of options that Congress may wish to employ.
3. The federal budget deficit is an obstacle to the creation of new domestic programs that target known risk and protective factors in individuals and communities.

Schools and Peers

The primary focus of federal efforts at community-based drug prevention is programs aimed at our nation's schoolchildren. In fiscal year 1993, Congress appropriated $598 million to DOE under the Drug-Free Schools and Communities Act of 1986. The federal government could **continue to fund school-based prevention programs, with a continued emphasis on prevention curricula and evaluations that are limited to substance use prevention. The** likely limited effects on preventing abuse among high-risk youth would continue. Other school-based prevention programs would continue to be implemented sporadically, without significant evaluation and with few or unknown effects.

If Congress decided that more rigorous evaluation of school-based programs was called for, it could mandate **DOE to spend a set percent of its Drug Free Schools monies on research and evaluation of prevention curricula and the dissemination of findings.** A special initiative could be launched to test prevention curricula for high-risk youth and for different racial and ethnic groups, since most of the research and evaluation to date has been based on samples of schools with middle income white youth. Special expertise would need to be brought in, on staff and as advisers, to assure the research and evaluation meet high standards of methodological rigor. This could be achieved by hiring staff with research and evaluation expertise, detailing staff from the NIDA, setting up an interdepartmental advisory group that guides and oversees a research and evaluation program, or appropriating funds directly to NIDA (e.g., as a set-aside from the Drug-Free Schools appropriation) to support such a research and evaluation program. Also, easier access to information about the many drug prevention curricula that exist could help school personnel select curricula that fit their needs. **DOE could be directed to prepare and disseminate more widely information about the purposes, design, methods, resources required, and evaluations (if any) of drug prevention curricula currently available, and to inform school personnel of the limitations of school-based curriculum approaches and the growing availability of supplementary and alternative approaches.** If Congress decided that Drug-Free Schools funds should be used more widely to target risk and protective factors found in school-aged populations, it could require DOE to **set aside a certain percentage of Drug-Free Schools funds for a variety of activities that target high-risk youths and to work individually with them and their families.** Such targeting could enhance activities already carried out under the Drug-Free Schools Act (e.g., Drug Abuse Resistance Education, replication of successful programs, local programs for high-risk youth, school personnel training). However, congressional mandates could reduce state and local flexibility in tailoring programs best suited to local needs, and could increase administrative costs associated with implementing the Drug-Free Schools Act.

In addition to Drug-Free Schools programs, comprehensive primary health, mental health, and social services can be provided in many school-based clinics. **School-based clinics can be supported by a variety of federal funding sources, including Medicaid, the Maternal and Child Health Block Grant, Drug-Free Schools, and Special Education funds. DOE and the Department of Health and Human Services could be encouraged or directed to collaborate on the support of such services in schools.**

Since researchers have found that peers and other social influences strongly affect substance use, programs that strengthen total school envi-

ronments may be potent in preventing substance use and abuse. Models that involve school restructuring, parent involvement, mental health components, and elevated expectations for achievement have been developed and are being tested. The hypothesis is that engaging high-risk youth in positive educational environments and experiences can profoundly influence their behaviors for the better. **Congress could expand research on the effects of restructuring of school environments on substance abuse by appropriating funds for extensive large-scale longitudinal research that could be supported by DOE, NIDA, the Centers for Disease Control and Prevention (CDCP), and other federal agencies that conduct and support research on youth outcomes.**

Homes and Families

Congress appropriates funds for federal programs addressing substance abuse and addiction in homes and families, which are supported by the HUD and HHS' Administration on Children, Youth, and Families (ACYF) and CSAP. Also relevant to the health and welfare of families are health funding programs (e.g., Medicaid and Medicare) and welfare programs (e.g., Aid to Families with Dependent Children). Through its oversight, authorization, and appropriations of these programs, and others that impact on the quality of family life, Congress can support a number of preventive interventions that are both comprehensive and intensive. Programs can be initiated by almost any local service or support setting, such as health care, school, family preservation, juvenile justice, and housing authority, with coordination with other services and settings. Such interventions can include health care, counseling, intensive in-home services, neighborhood patrols, clean sweeps of public housing, and family and parent education for all family members.

Because substance abuse and other related problems can be influenced by so many family factors and programs, a long-term effort to identify family needs maybe desired. **Congress could enact legislation to create a Presidential commission or task force to formulate a national family policy and create a blueprint for long-term national efforts to shore up the many families, rich and poor, that would benefit from more guidance, skills, and support.** Such a national policy could be framed in the near-term, based on the many studies and program interventions that have been documented so far. Alternatively, it could be formulated later, after additional research and program interventions have been supported and major gaps in knowledge have been filled.

Workplaces

Congress could allow current activities that focus on providing workplace employees with information, development of drug-free workplace policies, drug testing, and employee assistance programs to continue. These programs are scattered among many federal agencies, with some leadership by the Department of Labor (DOL), CSAP, and the Office of Management and Budget.

If Congress chose to increase efforts in workplace antidrug prevention, it could **mandate that federal agencies increase the information that is made available to workplaces about drug-free workplace programs and policies.** For example, DOL is implementing an electronic database, with information about workplace substance abuse treatment, prevention, and other control programs and research. Such a database, if properly supported, publicized, and accessed by businesses and unions, could help workplaces identify and implement approaches that can meet their needs in affordable ways.

Recreational and Community Settings

Congress currently funds community partnership demonstration programs administered by CSAP. These partnerships foster public/private sector partnerships that create and preserve comprehensive strategies for addressing substance abuse prevention within communities. A major advantage of these partnerships is the ability to create programs that address substance abuse prevention within individual communities. As with

other drug prevention programs, however, evaluation has generally been limited. Congress could, through appropriations and authorization, **direct CSAP to expand the provision of technical assistance and expand the national process and outcome evaluation of partnerships.** More site visits would be possible, with additional resources for national and regional workshops, conferences, and training.

Other federal activities in this area remain limited and largely uncoordinated. Major current programs are administered by the Department of Agriculture's Cooperative Extension Service (with its 4-H program, which is refocusing its efforts on high-risk youth) and CSAP (through some of its High Risk Youth Demonstration Grants). The President Council on Physical Fitness addresses one aspect of recreational and leisure activities--that is, physical fitness. If Congress decided to provide more information and support more research on recreational, leisure, and other youth development programs, **an information clearinghouse could be established to share information about federal and nonfederal recreational, leisure, and youth development activities.** The purpose would be to help communities and program developers identify and develop such programs especiall y for youth at risk of drug use and abuse. The clearinghouse could be managed in-house or under contract, and could be located in the Cooperative Extension Service (which is now attempting to redirect 4-H programs to address high-risk youth): ACYF; or CSAP (perhaps in the existing National Center for Alcohol and Drug Information, a federally sponsored clearinghouse),

The dearth of recreational places, especially in highly developed urban areas. can be remedied by an enhanced national effort to **acquire land and facilities for park and recreation purposes.** Such an effort could focus especially. but not exclusively, on rural and inner city areas where low property values make the acquisition of such properties financially attractive as long-term investments in the future development and enrichment of communities. Such a national effort could be comparable in scope and long-term commitment to the development of the national park system, but could contribute to a broader national system of parks owned and managed by the federal, state, and local governments specifically for more intense human uses. Such a system could focus on the developmental needs of youth, especially in urban areas, where usable open spaces are often in short supply. Congress could designate a lead federal agency for such an effort (e.g., Department of Interior or HUD), and could acquire properties outright or by encouraging and subsidizing the acquisition of properties by nonprofit groups and by state and local governments. The latter approach would require less federal funding and administration. Possible sources of land and facilities include: closed military bases, holdings of the Resolution Trust Corporation, assets forfeited through drug seizures, individual gifts and bequests, and corporate and philanthropic gifts.

AVAILABILITY

The primary current focus of federal antidrug efforts is stemming the physical supply of illicit drugs. A multitude of policy issues arise in addressing drug availability, most of which are beyond the scope of this report. The discussion in chapter 4, however, touches on two availability issues currently on the congressional agenda.

Taxes

The federal government currently levies excise taxes on alcoholic beverages and tobacco products. Excise taxes on all types of alcoholic beverages were raised in 1990 to their current levels. Currently, for example, beer (six pack, 12-ounce cans) carries a 33 cent federal excise tax, a 750 ml bottle of wine carries a 21 cent federal excise tax. A pack of cigarettes carries a federal excise tax of 24 cents. If Congress takes no action, current federal levies will remain in effect.

Congress could **enact legislation raising the federal excise tax on a variety of tobacco and alcohol products if it sought to decrease consumption of such products, to recover estimated societal costs (i.e., health costs, injury,**

death) resulting from consumption of such products, or to raise revenue for federal spending programs. Such tax hikes could be targeted at all tobacco and alcohol products, or at selected products in these industries. Advocates of increased excise taxes have argued that abuse of and addiction to tobacco and alcohol products cost the United States more than any illicit substance; that increased taxes would make such products less economically affordable and hence less used and abused; that increased taxes could be used to pay for financial damages arising from the use of such products; and that such excise taxes, which have increased less rapidly than the general rate of inflation, should be adjusted upward to reflect inflation. Opponents of taxation have argued that excise taxes are regressive in that they target primarily low- and middle- income taxpayers, that increased taxes would result in significant losses to major companies that are important players in the American economy, and that targeting so-called sin taxes unfairly singles out millions of Americans who use tobacco and alcohol products.

Alcohol Labeling

Federal law currently requires that **each alcoholic beverage container bear a specific warning statement that is conspicuously and prominently located (27** USC **215).** This requirement was enacted by Congress in 1980. Both Congress and States have authority regulating alcohol advertising. At least 35 states regulate alcohol advertising, and self-policing by segments of industry places some limits on advertising (e.g., the distilled spirits industry code prohibits the advertising of liquor on radio or television).

Congress has considered legislation that would **require warnings on all alcohol beverage advertising, both print and electronic media.** Congress could amend current alcohol labeling law to require stricter labeling (e.g., multiple labels, rotating labels, specific messages). Opponents of such action argue that no significant relationship has been found between exposure of individuals to alcoholic beverage advertising and/or labeling and drinking behaviors.

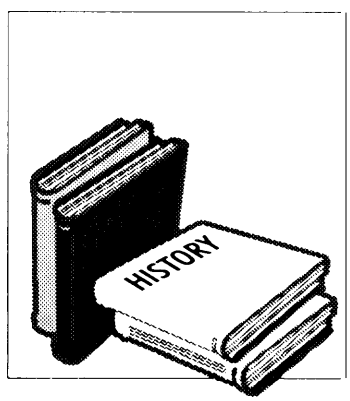
Appendix A: Drug Control Policy in the United States: Historical Perspectives

A

The United States has always been a drug-using country. In colonial days, people drank more alcohol than they do today, with estimates ranging from three to as many as seven times more alcohol per year (13) While public drunkenness was a criminal offense, it was generally considered a personal indiscretion. (1). The temperance movement began in earnest after the Revolution, when heavy drinking was revealed to be a problem, and religious figures became committed to temperance. (1). Since then, the American experience with both licit and illicit drugs can be viewed as a series of reactions to the public's shifting tolerance toward their use (9).

THE EARLY 1900s: NARCOTICS AND COCAINE

In the late 19th century it was possible to buy, in a store or through mail order, many pseudomedical preparations, containing morphine, cocaine, and even heroin (9). The ubiquitous soft drink Coca-Cola used to contain cocaine until 1903, when it was replaced with caffeine (9). Pharmacies sold cocaine in pure form, as well as a number of opium-derived drugs, such as morphine and heroin, the latter of which became well-known when it was marketed by the Bayer Co. beginning in 1898 (10). Physician prescriptions of these drugs increased from 1 percent of all prescriptions in 1874 to between 20 to 25 percent in 1902; they were not only available but they were wide] y used, without major concerns about negative health consequences (14).



Cocaine and narcotic preparations were taken off the market for various reasons. Increasing awareness of the hazards of drug use and adulterated food led to such regulations as the Pure Food and Drug Act of 1906 that required that fraudulent claims be removed from patent medicines, as well as disclosure of habit-

forming substances. The passage of several anti-narcotic and pharmaceutical labeling laws was spurred on by these health concerns, a growing temperance movement, the development of safe pain relievers (such as aspirin), a broader range of medical treatments, and the growing immigrant population thought to be associated with specific drug-using practices. However, these laws did not make patent remedies, cocaine, and opium illegal. Some individual states imposed tighter restrictions on their availability, but there was no uniformity among state laws. It was United States involvement with international narcotics concern that led there (9,10.1 4).

In 1909, the International Opium Commission called by the United States, met in Shanghai, to begin an international discussion concerning the problems of narcotics and the narcotics trade. Twelve nations. in addition to the United States, were present to discuss problems relating to opium. At that time the perception in the United States was that Chinese immigrants were to blame for the opium smoking problems. This angered the Chinese, who had instituted strict campaigns against the sale and use of opium within their own country. The Chinese were seeking U.S. assurances for help in ending Western opium trafficking into China. The State Department not only wanted to support China drug control efforts, but thought that international drug control measures would help stanch the flow of drugs into the United States, and thus the nonmedical consumption of these drugs. It would not be until two years later, in the Hague. that a treaty would be signed stating that all the signatories would enact domestic legislation controlling narcotics trade, specifically limiting the use of narcotics for medicinal purposes (9,10).

Hamilton Wright, the State Department's opium commissioner, attempted to draft legislation but met opposition from the States, the medical profession, pharmacists and pharmaceutical companies. After nearly three years of debate, Congress passed the Harrison Act in December 1914 (named for Representative Francis Burton Harrison, who introduced the initial form of the bill for the Administration). The bill provided for strict control of opium and coca and their derivatives: both their entry into the country and their dispersion to patients. Maintenance of addicts by physicians was allowed until 1919. Opposition to the Harrison Act came mainly from pharmaceutical companies and pharmacists, who objected to what they called the Act's confusing and complex record keeping requirements (9).

Passage of the Harrison Act reflected, in part, growing public sentiment that opium and cocaine were medicines to be taken only in times of illness (and then only when prescribed by a physician) and that these substances could cause insanity and crime, particularly in foreigners and minorities. Smoking opium was associated with Chinese immigrants; popular belief also held that cocaine would affect blacks more forcefully than whites and incite them to violence. Marijuana was believed to have been brought into the country and promoted by Mexican immigrants and then picked up by black jazz musicians. These beliefs played a part in the 1937 Marijuana Tax Act, which attempted to control the drug's use (9). As early as 1910, many people argued against any nonmedical use of narcotics.

PROHIBITION AND BEYOND

Focus on Alcohol

Ratification in 1919 of the 18th amendment prohibited the manufacture, sale, transportation, importation, and exportation of alcohol and shifted the Nation focus for more than a decade from the dangers of narcotics to the Nation's alcohol problems. Prohibition had its roots in the Temperance Movement, which began shortly after the Revolution. In 1784, Benjamin Rush, a physician and signer of the Declaration of Independence, published a pamphlet entitled, "An Inquiry Into the Effects of Ardent Spirits on the Mind and Body," which was widely disseminated among Temperance leaders. In it he described a "disease model" of excessive drinking, which characterized drunkenness and alcohol addiction as a "disease of the will," in addition to causing many physical diseases. By the mid-19th century, the American middle class had become more aware of the dan-

gers of alcohol to the family, the nation, and the factory (1). By the late 19th century and early 20th century, the Temperance Movement came to be associated almost exclusively with American Protestantism as a political mechanism to control the growing numbers of non-Protestant immigrants. This political and social strength helped, in 1919, to ratify the 18th amendment which forbade the sale of alcoholic beverages, and to implement it by means of the Volstead Act in 1920 (1).

The shifting tolerance of Americans toward substance use is evidenced by the successes and failures of the Prohibition era. In 1919, many were optimistic that the prohibition of alcohol would solve many of the country's social problems. If alcohol contributed to the crime and unemployment associated with the cities, then removing it from the market might help solve those problems. However, despite evidence that consumption declined (based on declining rates of death due to cirrhosis and of alcoholic psychosis in State mental hospitals), there is also evidence that widespread dishonesty existed in the enforcement of dry laws. Jobs to enforce Prohibition were doled out as political favors, which may have contributed to graft, corruption, and the surge in underworld crime (9, 17). In addition to the perceived rise in corruption, the passage of progressively stricter laws regarding violations of the Volstead Act also contributed to waning public support of prohibition (17). The 1933 repeal of Prohibition signaled that public sentiment had once again become favorable toward alcohol, and alcohol and its related problems returned to private, rather than public, arenas.

The scientific literature of the 1930s and early 1940s concentrated mainly on captive alcoholic populations in jails, mental hospitals, and skid row, allowing many Americans to distance themselves from alcoholism (1). During this same period, Alcoholics Anonymous (AA) was founded, but lacked mainstream recognition until the 1950s and 1960s when the scientists lent support to the disease model of alcoholism, which has always been the central tenet of AA (1, 11).

Focus on Narcotics

While alcohol experienced a transition period in respect to public tolerance, negative attitudes toward narcotics and other drugs remained constant, or became even more severe. During the 1920s, the Federal government expanded its antidrug efforts through new Treasury Department regulations (8). In 1930, President Hoover created the Federal Bureau of Narcotics and appointed Harry Anslinger as the Commissioner of Narcotics. a position Anslinger held from 1930 to 1962, a precursor, perhaps, to the modern day drug czar. For more than three decades, Anslinger oversaw all aspects of drug control, from interdiction to domestic supply, to public relations. He effectively used religious and other antidrug groups to maintain a high antidrug sentiment in the country. He also controlled the flow of legal drug supplies, by keeping watch over doctors who might prescribe unusually large amounts of narcotics. Anslinger was opposed to the medical treatment of addiction, and addicts, like alcoholics, were seen as deviants (9, 15).

Prior to the mid-1960s, marijuana use in the United States was mostly confined to various subgroups such as Mexican laborers, jazz musicians, and beatniks. Although portrayed as a killer weed and a menace by anti marijuana reformers, there is little evidence that it was either at this time. In 1937, the Marihuana Tax Act (the Federal government then spelled marijuana with an "h"), became law, making the use and sale of marijuana without a tax stamp Federal offenses. Some companies were permitted to apply for a license to use cannabis products (e.g., for birdseed, paint and rope), and doctors could still prescribe marijuana in limited circumstances. However, starting in 1937, recreational use was punished with greater severity (15). Some speculated that the passage of the Marihuana Tax Act resulted from strong anti-Mexican sentiment in the Southwest and the political power of Anslinger (5).

Intolerance toward drug use was very strong in the 1930s and 40s. Federal laws concerning the

sale and use of drugs got progressively stricter, culminating in the introduction of the death penalty for the sale of heroin to anyone under 18 years old by anyone older than 18 (10). Illicit drug use during these decades was low in the mainstream population. This marginalization of narcotics (or at least, of the people who used them) may have played apart in the resurfacing of these drugs after the 1930s. There was a concern during World War II that American soldiers in Asia would succumb to drug supplies available in those countries and return home with drug habits. The Bureau of Narcotics received no budget increases, since Congress apparently believed it was well equipped to deal with the current drug levels (9).

In the 1950s, however, heroin was brought into the country in larger quantities than at any time since it was outlawed. Dealers learned that poor quality heroin could be sold at inflated prices, and this higher cost pushed users into criminal lifestyles heretofore not seen on such a wide scale (12). A nationwide scare that drug use would spread from the urban poor (mostly minorities) to the rest of the country erupted. The fact that young people appeared to be the biggest users of heroin was particularly alarming. This fear was reflected in the passage of the Narcotic Control Act of 1956, which increased penalties for the sale and possession of marijuana and heroin (15).

The reaction to this rise in drug use was not entirely fearful, however. Scientific and technological advances offered altemative answers to coping with the drug problem a switch from the past tactics of law enforcement. Even though the stereotypical heroin user was still a poor minority, new ideas for treating and helping these people emerged as part of increasing acceptance of the medical model of addiction. In the 1960s, methadone maintenance pilot programs were launched. By using the long-acting opioid methadone for treatment of addiction to the short-acting opiate heroin, these programs offer a way for heroin addicts to control their addiction (6).

1960s-PRESENT

In the 1960s, white middle-class youths, who were more visible than their minority counterparts, began experimenting with drugs, including marijuana and heroin, causing wide public concern and demand for more treatment approaches and additional law enforcement (17). Some of this new interest in drug use may be attributed to the intolerance toward it in the preceding decades. Marijuana had never been widely used, and after the 1930s its use was not a widespread concern. It was rediscovered by young people in the 1960s, who had grown up with parents who used alcohol. Some of the drug consumption may also be linked to an increase in consumption generally during the late 1960s and early 1970s, the Vietnam War protest movement, and the rapid changes in American society that occurred in those years (9,10,17).

Despite the image of the sixties as a time of widespread experimentation, the increase of drug use activated many who had been quiet on the issue. Marijuana, the drug of choice among many young people, was seen by some researchers as the gateway to more dangerous drug use. Richard Nixon was elected President in 1968 on a law and order platform, and it is said that no other President has campaigned as hard against drug abuse (9). As during World War II, concern rose that soldiers serving in Southeast Asia would develop drug habits while there. In this case, the fears were well-founded, as many servicemen did avail themselves of cheap supplies of heroin and marijuana. However, even among those who became addicted, many stopped their drug use upon returning to the United States. During the 1960s, the old linkages between corruption, Asians, and opium surfaced once again in public opinion, leading to more stringent measures to stop the flow of drugs into the United States from both Asia and Latin America (8).

Public support of law enforcement against drugs was high during the late 1960s and early 1970s, and President Nixon spoke of mounting “a frontal assault on our number one public enemy [drugs],” but long mandatory minimum sentences for possession of small amounts of marijuana dis-

turbed many Americans, even those who did not approve of marijuana use. The Comprehensive Drug Abuse Prevention and Control Act of 1970 lessened penalties for possession of marijuana. It also established a system for classifying drugs into five schedules, which is still used today. Drugs are placed in each schedule based on their potential for abuse, their known harmfulness, and medical value. Marijuana and heroin are listed in schedule 1-drugs with high potential for addiction and no recognized medical value. There have been, however, limited experimental programs approved by the DEA and FDA for the use of marijuana in treatment of nausea due to chemotherapy and of ocular pressure due to glaucoma. Cocaine is listed in schedule 2-drugs with potential for addiction for acceptable for some medical applications. Subsequent to the establishment of this system, drug policies and laws for individual drugs have been based on the drug's schedule (3,16).

In 1972, the President's National Commission on Marijuana and Drug Abuse recommended that the laws against the use of rnarijuana be relaxed, since the enforcement of these laws was becoming too burdensome to police in some areas. and was considered intrusive on individual privacy in others. The drug was incresingly thought to be innocuous in its effects, both by scientists and others (4). Several States passed decriminalization laws, which allowed possession or use of small amounts of marijuana and imposed fines instead of prison sentences for transgressions of minor possession laws (10). The Commission remained strict on cocaine, which was also seeing a surge in use, but few experts thought it was physically addictive or should be classified in the same category as other narcotics.

Despite President Nixon's emphasis on "law and order" responses to drug use, his drug budget favored prevention, education, and treatment. The National Institute on Drug Abuse (NIDA) was created as the lead agency for demand reduction, directing Federal prevention and treatment services and research. The Drug Enforcement Administration was created as the lead agency for supply reduction, and single state agencies were created to guide Federal funds into state and local antidrug programs (3),

From the mid-sixties to the late seventies, the composition of drug users changed substantially. While drug use was still associated primarily with minorities and the lower classes. drug use by middle-class whites became a widespread and more accepted phenomenon. As in the late nineteenth and early twentieth centuries. when middle class whites haphazardly used narcotic preparations, this new group of drug users down-played or ignored the dangerous effects of drugs, and extolled their virtues as agents of nonconformity and mind-expansion. Cocaine was an expensive and high-status drug, used mainly for recreation by upper- and middle-class whites.

From the drug experiences of this cohort, which were by no means entirely positive, the public of the late seventies was better educated about the effects of drugs, and public disapproval of drug use began once again to increase. Drug use, however, particularly of cocaine and marijuana remained high. The Ford Administration (1974- 1977) focused on the drugs it thought posed the greatest danger—heroin, amphetamines, and barbiturates. Some even thought that drugs such as cocaine and marijuana should be legalized, "so as to end the enormous government expenditures of money and time on a problem that only seemed to bring profits to drug dealers and elicit contempt for the law from an ever-growing body of drug users" (9).

During the Carter Administration (1977-198 1), Peter Bourne, a special assistant for health issues, argued for Federal decriminalization of possession of small amounts of marijuana, while focusing interdiction efforts on heroin. But Bourne resigned over a scandal involving criticisms over his prescribing practices. His resignation forced President Carter to take a harder position on drugs, and Federal decriminalization never occurred. There were still States in which marijuana was decriminalized, but these decreased in numbers through 1990, when the last State—Alaska—to have decriminalization repealed those laws.

The departure of Bourne coincided with the emergence of several parents' groups concerned about drug use by their preteen children. One group in particular. in Atlanta, Georgia, became enraged when they found that in addition to drug use at parties, their children were able to buy drug paraphernalia and prodrug literature in local stores. The group formed the Parent Resources Institute on Drug Education, National Families in Action, and the National Federation of Parents. These groups were instrumental in prodding NIDA to publicize more widely the dangers of marijuana and other drugs once thought of as harmless.

The Administration of Ronald Reagan (198 1- 1989) favored a strict approach to drug use and increased law enforcement. First Lady Nancy Reagan actively campaigned against drug use, urging school children to "Just Say No." At the same time, funding for research and treatment decreased, while the availability of cocaine, heroin, and marijuana remained the same (9). The budget for antidrug related activities rose from $1.5 billion in 1981 (split nearly equally between supply reduction (domestic law enforcement and international/border law enforcement) and demand reduction (research, prevention and treatment) to $4.2 billion by the end of President Reagan's second term. Two-thirds of the funds were now allocated for law enforcement activities, with the remaining third allocated for demand reduction (2). In 1984, the Crime Control Act increased dramatically Federal mandatory minimum sentencing provisions for drug-related crime, including the manufacture, distribution, or possession of controlled substances. It also expanded the criminal and civil asset forfeiture laws to penalize drug traffickers and increased Federal criminal penalties for drug-related offenses (3). This trend continued through the remainder of the Reagan administration as well as that of President Bush.

The 1980s saw significant shifts in patterns of cocaine use. The negative effects of cocaine use, especially long-term use, had previously been masked, but middle-class users with drug-related problems suddenly were more common. Concurrently, cocaine smuggling escalated, resulting in increased availability, lower prices, and higher quality. Low-income, minority communities began experiencing major drug problems, first with powdered cocaine, then in the mid-eighties especially with the new form of cocaine-crack. Commonly called an epidemic, the spread of this smokable cocaine inspired both President Reagan and antidrug groups to heightened drug intervention efforts. Crack appeared to be highly addictive, as well as affordable, and fear of its consequences forced many lawmakers into action. The Anti-Drug Abuse Act of 1986 authorized more funds than ever before for the war on drugs, most of which was designated for international interdiction activities (9), and the establishment of the Office of Substance Abuse Prevention (OSAP). The AIDS epidemic has also affected patterns of drug use, since some intravenous (IV) drug users may have switched to smoking crack in order to avoid exposure to the AIDS virus. Other IV drug users, however, have continued to inject, and comprise a large percentage of the AIDS-infected population.

While the main focus of drug control policy in the 1980s was interdiction of illicit drugs, significant policy initiatives concerning alcohol were also implemented. For example, the goal of the national minimum drinking age of 21 was stated in 1984 and achieved by 1988. Warning labels were required on all retail containers of alcoholic beverages beginning in 1989 (7).

When George Bush was elected President in 1988 the climate within the country was highly intolerant to the use of illicit drugs. President Bush echoed President Nixon when he declared that the drug epidemic was "public enemy number one" (16). The Anti-Drug Abuse Act of 1988 mandated the creation of the Office of National Drug Control Policy (ONDCP), to be headed by a director, sometimes called the drug czar, who would coordinate U.S. drug control and abuse policy, resources, and operations (Public Law 100-690). The first director was William Bennett, former Secretary for Education under President Reagan. He was followed by Robert Martinez, former Governor of Florida. The director, in conjunction with the President and Cabinet Secretaries, sets

Administration policy on drug control. However, ONCDP lacks budgetary authority, and under President Bush the director of ONDCP was not a Cabinet position. During the Bush Administration, additional funds were authorized for the war on drugs, including increased funds for treatment and prevention. However, most of the funds were designated for law enforcement activities. Spending for antidrug-related activities rose from the high of $4.2 billion under President Reagan, to a proposed $12.7 billion in the last year of President Bush's term. Again, the monetary split was rough-1 y two-thirds for law enforcement and international interdiction activities and one-third for demand reduction (2).

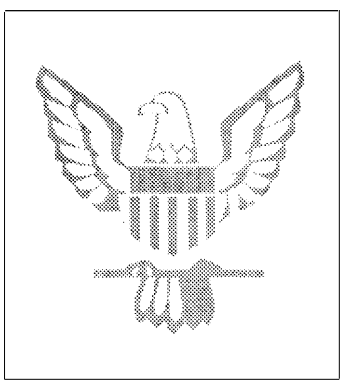
While "The War on Drugs" has remained part of the political lexicon, President Clinton, after taking office in 1993, cut the Office of National Drug Control Policy from 146 positions to 25. He elevated the director of ONDCP to cabinet status, and Lee P. Brown, former Police Commissioner of New York City was appointed to this position. During his campaign for the presidency, Clinton advocated drug treatment on demand, and the addition of 100,000 new police officers to the streets.

B Appendix B: Federal Programs: Prevention and Causation

A total of 12 executive branch departments, four independent agencies, one multiagency program (Weed and Seed), one White House office (the Office of National Drug Control Policy—ONDCP), and the Judiciary, all receive federal funding as part of national drug control strategy. These efforts include interdiction, treatment, and prevention programs. In order to compile information on federal substance abuse prevention initiatives and to discuss factors related to substance use, abuse, and addiction, the Office of Technology Assessment (OTA) and the General Accounting Office (GAO) convened a two-day workshop. Representatives from federal agencies that were members of ONDCP'S Demand Reduction Working Group were invited (for list of workshop participants, see appendix E).

During the workshop, federal agency representatives were asked to make a short presentation covering the following three issues:

1. The agency's substance abuse prevention program(s). What are its goals and objectives (primary or secondary prevention, research)? What are its target populations?
2. Risk and/or protective factors related to substance abuse that the agency has identified. To what extent is the agency able to address specific factors in the implementation of prevention programs?
3. Methods the agency uses for assessing whether prevention programs are effective? What requirements (if any) does the agency impose on grantees for reporting program effectiveness and evaluation outcomes?



This appendix summarizes presentations made at the workshop, and focuses on federal agencies with external programs (e.g., outreach, technical assistance, grants). In addition to these programs, each federal agency, pursuant to the federal Employee Substance Abuse and Treatment Act of 1986 (Public Law 99-570), maintains an employee assistance program (EAP) to provide appropriate prevention, treatment, and rehabilitation programs for drug- and alcohol-related problems among civilian employees. The total federal government cost for EAPs in fiscal year 1991 was $30.5 million, covering administrative and counseling services for employees seeking to overcome drug, alcohol, emotional, and other personnel problems (4).

ACTION

ACTION's mission is to foster and expand voluntary citizen service in communities throughout the Nation in activities designed to help the poor, the disadvantaged, the vulnerable, and the elderly. Needs assessment and programs that address needs are designed and implemented at the local level. (In *April,* 1994, *ACTION was merged into the Corporation for National Service.)*

The agency spends over $10 million annually to support volunteer programs addressing drug abuse prevention. The Drug Alliance Program awards about $1 million each year to community-based volunteer efforts designed to assist in the delivery of illicit drug use prevention information. Under Volunteers in Service to America (VISTA), full-time stipended volunteers are assigned to local sponsoring organizations to perform activities determined and defined by the sponsoring organization and the low-income communities in which they serve. The needs being addressed are numerous. and include the need to reduce the spread and use of illicit drugs in low-income communities. Over 450 full-time volunteers are currently engaged in drug reduction projects. Drug abuse prevention activities can be found in other ACTION programs, including student community service programs (small grants 1 inking student volunteers with their communities), the retired senior volunteer program (intergenerational drug abuse prevention activities), and a foster grandparent program (person-to-person services between senior citizens and children who are mental] y, emotionally, or physically disabled) that frequently includes children born to mothers who used drugs during pregnancy.

DEPARTMENT OF DEFENSE

The Department of Defense (DOD) consolidated all drug interdiction and counter-drug activities into a single appropriations line in fiscal year 1990. The demand reduction component accounts for approximately 10 percent (about $10 million) of DOD drug-related spending; by far the largest percentage of dollars is spent on support to law enforcement and the National Guard.

The linchpin of DOD's prevention efforts is mandatory urinalysis drug testing (28,000 tests were conducted during fiscal year 199 1). DOD policy for military personnel is zero tolerance. In most cases—the exception being lower ranking enlisted personnel caught for the first time—an officer or noncommissioned officer caught using illicit drugs will be processed for separation from the service. Substance abuse education for military personnel begins upon reporting to duty. There are mandatory briefings each year for military personnel, as well as during transfers between commands. DOD dependent school programs on military installations throughout the world have adopted the Drug Abuse Resistance Education (DARE) program.

Congress recently expanded DOD's legal authority to conduct community-based awareness programs, providing authority to the National Guard and to the active and reserve military to go out beyond military installations, particularly into innercity schools, to present antidrug programs. Congress provided 5 years authority for this program.

DEPARTMENT OF EDUCATION

The Department of Education (DOE), pursuant to the Drug-Free Schools and Communities Act (DFSCA) of 1986 (Public Law 99-570) and sub-

sequent amendments, implements the largest federal program addressing drug abuse prevention. In fiscal year 1993, Congress appropriated $598 million for DFSCA.

The majority of DFSCA funds is allocated as a formula grant program to States. Each State is required to allocate at least 90 percent of the funds it receives to local educational agencies (LEAs) to improve antidrug abuse education, prevention, early intervention, and rehabilitation referral programs. Remaining State funds are allocated to the governor of each State. The governor provides financial support for antidrug abuse efforts to parent groups, community based organizations, or other public or private nonprofit entities. At least 42.5 percent of the Governor's funds must be used for programs for high-risk youth.

At the national level, DOE operates the following grant programs:

- **Emergency.** This program provides funds to LEAs that demonstrate a significant need for additional assistance in combating drug and alcohol abuse. LEAs compete for funding to support a comprehensive range of services, including educational programs, counseling programs, enhancement of school security, after-school programs, programs for parents and other community outreach efforts, and alternative programs for students with a history of drug abuse or others who are difficult to reach in the regular school setting. Appropriation in fiscal year 1993: ($24.5 million).
- **Institutes of Higher Education. The** Fund for the Improvement of Postsecondary Education in the Office of Postsecondary Education has awarded more than 800 grants since fiscal year 1987 to institutions of higher learning to develop, implement, operate, and improve drug education and prevention programs for students enrolled in institutions of higher education. Three discretionary grant competitions are involved: institution-wide programs for comprehensive, campus-based programs; a specific approaches program; and the National College Student Organizational Network Program to support student organizations prevention efforts. In addition, the Office of Elementary and Secondary Education awards grants to institutes of higher education to support demonstration programs in drug and alcohol abuse in elementary and secondary schools. Appropriation in fiscal year 1993: ($19.3 million).
- **Regional Centers.** DFSCA authorizes the Department to support five regional centers to: 1) train school teams to assess and combat drug and alcohol abuse problems, 2) assist State educational agencies in coordinating and strengthening prevention programs, 3) assist local educational agencies in developing training programs for educational personnel, and 4) evaluate and disseminate information on effective substance abuse education and prevention programs and strategies. Five cooperative agreements were awarded during fiscal year 1990 for 4-year terms. Appropriation in fiscal year 1993: ($16. 1 million).
- **School Personnel.** This program provides financial assistance to State and local educational agencies and institutions of higher learning to establish, expand, or enhance programs and activities for the training of elementary and secondary school teachers and administrators, and other personnel in the areas of drug and alcohol abuse education and prevention. Appropriation in fiscal year 1 993: ($1 O million).
- **Indian Youth.** This program is administered under a memorandum of understanding between the Departments of Education and Interior. Drug and alcohol abuse education and prevention services are provided to Indian children attending elementary and secondary schools operated by the Bureau of Indian Affairs. Appropriation in fiscal year 1993: ($5.6 million).
- **Counselor Training. This** program provides financial assistance to State and local educational agencies, institutions of higher learning, and private nonprofit agencies to establish, expand, or enhance programs and activities for the training of counselors, social workers, psychologists, or nurses who are providing or

will provide drug abuse prevention, counseling, or referral services in elementary and secondary schools. Appropriation in fiscal year **1993: ($3.6** million).

- **Native Hawaiians. This** program provides funding for drug prevention and education for Hawaiian natives. The Governor of Hawaii designates organizations eligible to receive funding under this program. Appropriation in fiscal year 1993: ($1, 1 million).

In addition to these grant programs, the Department supports a number of activities, including the development of curriculum and production of drug prevention newsletters, videotapes, and other materials in conjunction with the Department of Health and Human Services (HHS) and the National Clearinghouse for Alcohol and Drug Information. In conjunction with the Department of Justice, the Department of Education is supporting activities at the National School Safety Center on prevention of drug-related violence in schools.

A Department-commissioned study (1) estimates that DFSCA has been very successful in providing schools and localities with resources to expand their programs. An estimated 11,000 local educational agencies (78 percent of the total) comprising approximately 94 percent of all schoolchildren receive DFSCA services. While coverage is extensive, evaluation efforts need to be strengthened in order to improve school-based prevention programs. Currently, 25 States conduct surveys in drug attitudes and use, but only 15 State education agencies had performed outcome studies.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Center for Substance Abuse Prevention

The Center for Substance Abuse Prevention (CSAP), created in 1986 by Congress as the Office of Substance Abuse Prevention, provides national leadership for alcohol and drug abuse prevention and intervention efforts, with special emphasis on programs for youth and high-risk populations.

To accomplish its mission, CSAP carries out demonstration projects targeted to specific high-risk groups; assists communities in developing long-term, comprehensive prevention programs that involve all sectors of the community; operates a national clearinghouse of publications and other materials and services; develops and carries out media campaigns and other knowledge-transfer programs; provides training in the prevention of addictive disorders for health care and allied professionals, parents, youth, multicultural groups, and others; and provides technical assistance and other services to help communities, organizations, and others develop and implement prevention efforts.

These projects address a number of risk and protective factors that fall within five major groupings: individual-based factors, family-based factors, school-based factors, peer-based factors, and community-based factors.

CSAP demonstration grants address different points on the spectrum of risk and protective factors. Primary evaluation is process-oriented, in order to assure that projects are targeting multiple systems (e.g., youth, family, schools, community organizations) seen as being crucial to effective drug prevention efforts.

Indian Health Service

The Indian Health Service (IHS) contracts with tribal groups for a variety of health care services. The fiscal year 1993 budget for alcohol and drug abuse prevention services was $82.3 million. Unlike other federal grants for such services, IHS provides funds for sovereign Indian nations on a contract basis. Thus, there is no mandate for demonstration programs, research protocols, or the like. IHS has a target population of 1.1 million people.

National Institute on Alcohol Abuse and Alcoholism

The National Institute on Alcohol Abuse and Alcoholism (NIAAA), part of the National Institutes of Health (NIH), is the primary federal research agency on alcohol-related programs including

epidemiology, genetics, neuroscience, medical consequences of alcohol and alcoholism, alcohol use and pregnancy, adverse social consequences of alcohol use and dependence, diagnostic criteria and screening instruments, prevention, intervention, and treatment.

NIAAA supports two types of prevention research. Basic prevention research explores factors that influence the risk of developing alcohol use problems. These factors include individual characteristics that may place a person at risk (e.g., age, gender, and family history) and factors within the environment that may affect risk (e.g. family interaction, workplace factors, characteristics of drinking establishments, and alcoholic beverage prices). Applied prevention research evaluates the effectiveness of purposeful actions taken to reduce problems related to alcohol use. Such actions include measures to modify the drinking environment (e.g., legislation establishing minimum drinking age, laws regarding drinking and driving, and server training programs) and measures designed to change individual behavior (e.g., educational programs).

Epidemiologic research has examined a variety of individual characteristics—"including age, gender, and race and ethnicity—related to alcohol consumption and risk for alcohol problems. For example, NIAAA has found that both alcohol abuse and alcohol dependence are more likely to occur among men than among women; young, single men are more likely to be frequent heavy drinkers and to report alcohol dependence and alcohol-related problems. Black men and white men have similar drinking patterns overall, although black men had somewhat higher abstention rates than white men (29 percent verses 23 percent, respectively,), and white men were somewhat more likely to be heavier drinkers. However, black men appear to experience some types of alcohol-related problems at lower levels of consumption. research has also focused on early behavioral characteristics of children that predict use of alcohol and other drugs, as well as individual risk factors associated with fetal alcohol syndrome (2).

National Institute on Drug Abuse

Programs and Target Populations

The National Institute on Drug Abuse (NIDA) is the lead federal agency for research to increase knowledge about the causes and treatment of drug abuse and addiction, to identify the means of preventing and controlling drug abuse, and ultimately, to eliminate the demand for illicit drugs. NIDA was created by Congress in 1974 as one of the three institutes in the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA). In 1992, with the reorganization of ADAMHA by Congress, NIDA was moved to NIH.

NIDA consists of three major components: staff offices, which assist the agency's Director with leadership and management functions; program divisions, which oversee research grants and contracts; and the Addiction Research Center (based in Baltimore, Maryland), NIDA's intramural arm.

The Division of Epidemiology and Prevention Research, one of six NIDA divisions, is primarily responsible for prevention and causation/correlation research. A broad-based epidemiology grant program examines the natural history, incidence, and prevalence of drug abuse in the population as a whole and among several subpopulations, such as children and adolescents and pregnant women and their offspring. Research efforts also focus on the etiology, or causes, of drug abuse, which encompasses the identification and study of risk factors, high-risk populations, and the crime-drug nexus. The fundamental information obtained from these studies guides NIDA in determining its research priorities.

By supporting researchers across the country and conducting its own field research, the Division seeks to answer questions such as what drugs are being abused, to what extent, and by whom. Major ongoing research efforts include the National Household Survey, the High School Senior Survey, and the Drug Abuse Warning Network, which monitor use trends among households, high school seniors, and emergency room populations, respectively.

Other areas of research interest include the consequences of drug abuse; the efficacy of various prevention strategies; and the economic, demographic, and psychosocial factors that place individuals at higher risk for becoming drug abusers. Drug abuse among children of child-bearing age, maternal drug use, and pregnancy outcomes are also areas of particular concern.

The Division works with State, federal, and international governmental agencies and private organizations to encourage the sharing of information. This is accomplished by developing community- and State-based epidemiologic surveillance networks and by providing technical assistance and other consultation to researchers interested in developing studies or surveys in areas such as prevention research.

In fiscal year 1992, the Prevention Branch had a research budget of $14 million and supported 40 grants. The Epidemiological Research Branch, which conducts etiology research, had a budget of $28 million and supported between 60 and 70 individual projects.

Factors Addressed

NIDA has sponsored etiologic research for 20 years. Its studies indicate that correlates to drug use and abuse can be clustered into four groups of risk and protective factors: individual, family, peer group, and community. As a result, NIDA encourages research that is theory-based, has multiple components in the intervention, is comprehensive to include multiple stages and environments.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

The Department of Housing and Urban Development (HUD) does not undertake research programs, but through its Public Housing Drug Elimination Program, targets a population identified as being at risk for drug abuse and addiction: residents of public housing.

The Public Housing Drug Elimination Program, funded at a level of$165 million in fiscal year 1992, has resulted in a total of more than 1,300 grants being awarded to public housing agencies for such activities as innovative drug education and treatment programs, counseling; support of tenant patrols acting in cooperation with local law enforcement agencies: physical improvements designed to enhance security; and employment of security personnel and investigators.

In addition, HUD sponsors a Youth Sports Program, designed to foster recreational activities in public housing, and technical assistance and training program that helps housing authorities and resident organizations assess the nature of local drug problems and develop a strategy for addressing problems.

DEPARTMENT OF INTERIOR

The **National Park Service** has implemented the DARE program in public schools adjacent to certain national parks and Indian reservations. The DARE program, taught by uniformed law enforcement officers, is designed to teach elementary and high school students how to resist peer pressure to use drugs. Over 70 park service personnel have been trained as DARE instructors; these instructors have made presentations to more than 8,000 students in 70 schools.

The **Bureau of Indian Affairs** (B IA) has been involved in the DARE program since 1988; 47 BIA personnel have presented the DARE program to 3,300 students. BIA has two substance abuse training programs—a counselor training program, to train school personnel, and a drug-free schools program, where BIA schools receive 1 percent of federal drug-free school funding (see description under Department of Education). BIA and HHS' Indian Health Service have an interdepartmental memorandum of agreement that results in the coordination of data collection, resources, and programs of both agencies to assist American Indian tribes and Alaska natives to achieve their goals in the provision of prevention, intervention, and treatment services for those affected by substance abuse.

DEPARTMENT OF JUSTICE

The Department of Justice is primarily responsible for interdiction efforts to stem the sale, possession, and use of drugs. While law enforcement officials have a primary focus on supply-side issues, a number of programs are targeted toward demand reduction. These efforts, spread across several DoJ entities, do not focus on root causes or risk factors per se, but rather at broad-based awareness building efforts.

Drug Enforcement Administration

The Drug Enforcement Administration (DEA) employs 20 agents (out of a total force of approximately 3,000 agents) in a demand-reduction program. Each of 19 geographic divisions has a demand-reduction agent, with the exception of the Atlanta office, which has 2 such agents. Total DEA spending for its demand reduction program is $700,000, with half those funds being obligated by DEA national headquarters, and the 19 field offices receiving funds ranging from $12,000 to $30,000 a year.

Because of the small budget and limited personnel for demand-reduction efforts, DEA attempts to work with intermediaries who develop drug prevention programs, in an attempt to maximize the effect of its efforts. DEA has identified five national priorities for its demand-reduction efforts: minority and high-risk youth, sports drug awareness programs, user accountability programs, training for law enforcement personnel, and development of community-based coalitions and alliances.

Activities include school visit programs, conducting about 100 drugs in the workplace seminars annually, and working with communities to adopt programs that are seen as being effective.

Federal Bureau of Investigation

The Federal Bureau of Investigation (FBI) established a Drug Demand Reduction Program (DDRP) in 1988 to augment the enforcement efforts of the FBI as a long-term solution to the drug abuse problem. DDRP seeks to reduce the demand for drugs in diverse communities through flexible strategies designed to focus primarily on the youth and to respond to community requests and needs.

A staff of 5 persons at FBI headquarters supports 60 special agents (14 of whom are full-time) across the United States. Agents go into communities to do drug prevention work, usually educational presentations that are a component of a larger, ongoing, comprehensive program. Field office programs report to the Office of Public and Congressional Affairs at FBI headquarters in Washington.

The FBI budget for this activity is approximately $300,000. The average field office receives about $800, although larger field offices, such as New York and Los Angeles, receive close to $8,000 for this program. The FBI has developed some materials on its own, and relies heavily on CSAP and the Department of Education for materials as well. Youths are the target population for most FBI-related programs.

Office of Justice Programs

The Office of Justice Programs (OJP) collects statistical data and conducts analyses of emerging criminal justice issues through five component units. Of these five components, two-the Bureau of Justice Assistance (BJA) and the Office of Juvenile Justice and Delinquency Prevention (OJJDP)—have a particular emphasis in substance abuse prevention issues.

Programs and Target Populations

BJA provides funding, training, and technical assistance to State and local governments to combat violent crime, gang activity, and drug trafficking. BJA's primary effort is the National Citizens Crime Prevention Program, a coalition of more than 110 federal, national, and State organizations. The national "Take a Bite Out of Crime" program featuring McGruff the dog, is perhaps the best-known part of this campaign. An offshoot of this effort is BJA's community drug abuse prevention initiative, designed to assist programs and encourage active participation by communities in working with law enforcement officials to enhance the quality of life by reducing crime, violence and drug abuse. BJA also sponsors national

night-out campaigns (e.g., front-porch vigils and community patrols), the Southern Christian Leadership Conference's program targeting African-American neighborhoods, expansion of boys and girls clubs in public housing projects, efforts to train instructors in working with parents to help their children remain drug-free, and the DARE program. As of July 1992, almost 14,000 police officers had received DARE training through BJA's regional training centers.

OJJDP awards funds to state and local governments and sponsors research to prevent and control juvenile crime.

Factors Addressed

OJJDP has identified a number of risk factors as predictors for delinquency and drug use: 1) early variety and frequency of antisocial behavior in elementary schools; **2)** having parents or siblings engage in crime or drug use; 3) family situations lacking supervision, excessively severe or inconsistent disciplinary practices, or low communication and involvement between parents and children; 4) family situations where high levels of conflict exist; 5) social isolation and multiple entrapment of parents in extreme poverty, poor living conditions, and low status occupations; 6) school failure; 7) association with drug-using peers; and 8) transitions, such as the change from elementary to junior high school, and junior to senior high school.

Evacuation Methods

Each project funded by BJA contains an evaluation plan. Although evaluation activities vary from bureau to bureau, four types of evaluations are generally conducted:

- Program assessments, where a program's strengths and weaknesses are described in order to evaluate progress made in solving the problem addressed by the program.
- Impact evaluations, describing how a program has an impact on the problem addressed, explaining the processes critical to the success of the program, with a focus on outcomes.
- Intensive impact evaluations, which explain why a program is effective as well as whether the program has had significant impact. They examine how a program produced results and depict the special processes to which the outcomes may be attributed.
- Evaluation reviews, which examine topics where a number of evaluations are already complete but have never been synthesized for use by the criminal justice system.

United States Attorneys

The U.S. Attorneys are the chief federal prosecutors in 94 district offices across the country. Within each of the 94 offices is a Law Enforcement Coordinating Committee (LECC) to improve cooperation between State, local, and federal law enforcement agencies within each district.

The primary role of U.S. Attorneys offices is on supply-side issues, including criminal prosecution and enforcement of asset forfeiture laws. Since the mid- 1980s, LECCS have become more involved in demand-reduction efforts in their districts, by playing a role in activities such as training seminars for law enforcement officials on drug use prevention; drug education subcommittees; task forces to assess the needs and resources of local communities; involvement in school assemblies; and coordination of antidrug rallies.

LECCS tailor their programs to local needs, and have resulted in variety of activities. In Delaware, for example, the United States Attorney and police chiefs throughout the state created a police rock band that goes into local schools with a local antidrug message. In Florida, the U.S. Attorney organized a law enforcement summit on drug abuse prevention. In the Northern District of New York, the LECC coordinator helped prepare a 1 -hour television and radio program that was simulcast on major networks in the Syracuse area. In the Northern District of Georgia, the LECC coordinator is involved in turning a former nightclub that was seized and forfeited into a law enforcement center that will also be used by young people as a drug-free recreational center.

DEPARTMENT OF LABOR

Section 4303 of the Anti-Drug Abuse Act of 1986 (Public Law 99-570 mandated the Secretary of the Department of Labor (DOL) to" . . . collect such information as is available on the incidence of drug abuse in the workplace and efforts to assist workers including counseling, rehabilitation, and employee assistance programs." The statute also authorized the Secretary to "conduct such additional research as is necessary to assess the impact and extent of drug abuse and remediation efforts."

While DOL lacks a direct mandate in substance abuse prevention, and therefore, deals indirectly with identification of root causes or risk factors, the Department is concerned because substance abuse and addiction directly affects several of its major mandates, including employee training, worker safety, occupational health, productivity, and competitiveness. Approximately 66 percent of illicit drug users are employed either full- or part-time, and it is assumed that alcohol abusers (1 in every 10 people in this country) are represented in the work force at about the same proportion that they are in the general population.

The Employment Training and Education Administration provides job training and education to address unemployment, which is a risk factor often associated with substance abuse. Through the Job Training Partnership Act, money is distributed through block grants to the States. Recipients of such monies are encouraged to provide drug education and awareness to participants.

The Job Corps program provides residential training programs for youth aged 16 to 21. They conduct drug screening, education, and orientation at all 105 Job Corps training sites, and all sites do some drug intervention.

The Mine Safety and Health Administration formed a substance abuse committee in 1985, consisting of representatives of labor, management in union and nonunion mines, and federal government agencies that have a role in reducing substance abuse. The committee has developed a manual and two videos on substance abuse prevention for distribution through 800 mines nationwide.

The primary effort undertaken by DOL has been a survey by the Bureau of Labor Statistics to collect information about drug testing programs in workplaces. This survey found that drug testing was more prevalent in larger establishments than in smaller ones, current employees were most often tested for reasonable suspicion, testing programs were more likely to target job applicants than current employees, and applicants were more likely than current employees to test positive for drugs.

The Department, in conjunction with the Small Business Administration (SBA) and the Office of National Drug Control Policy, has sponsored a national conference on substance abuse in small business, and is in the process of developing a substance abuse data base, drawing in large part on information available through other government agencies. Through the Occupational Safety and Health Administration, administers an employee assistance grant program to employers and employer groups to enable the development of employee drug and alcohol abuse programs. Under this grant program, $1.5 mill ion has been awarded to 23 groups.

OFFICE OF NATIONAL DRUG CONTROL POLICY

ONDCP was created by Congress as part of the Anti-Drug Abuse Act of 1988 (Public Law 100-690). The Director of ONDCP, the so-called drug czar, is responsible for coordinating U.S. drug control policy, resources, and operations.

ONDCP has no authority over federal agencies, nor does it issue grants or conduct research. As a policymaking agency, ONDCP created a national drug control strategy, which contained four elements for preventing drug use: mobilizing communities against drugs, educating young people that drug use is harmful and wrong, encouraging businesses to establish drug-free workplace programs, and promoting antidrug programs through the media.

Following his election in 1992, President Clinton cut the size of ONDCP staff and announced his intention to elevate the drug czar to Cabinet status.

SMALL BUSINESS ADMINISTRATION

SBA'S Office of Workplace Substance Abuse Prevention was established in 1992 to coordinate the Agency's efforts to help small businesses meet the challenges imposed by substance abuse in the workplace. In each of SBA'S 110 field offices throughout the country, an individual serves as a substance abuse coordinator, to provide direct assistance to the small business community.

The most tangible SBA effort to date is the development of a self-help drug kit to provide assistance and guidance to small business owners wishing to establish and implement a workplace substance abuse program. The kit, "Drug-Free: It's Good for Business," is a step-by-step system with instructions, training aids, forms, and informational material to assist business owners in adopting formal antidrug policies, provide supervisory and employee training, organize an employee assistance program, and (if desired) establish drug testing procedures.

SBA is developing a STOP DRUGS initiative (Small Businesses Together and Organized to Prevent Drugs), a coalition of small businesses willing to share information with other small business operators. SBA is working with NIDA and DOL to undertake research that specifically examines the effect of employee substance abuse on small businesses. SBA is also working with the DoJ's Weed and Seed program. SBA views its role as part of the '*seeding" component by offering financial and business development resources to targeted communities.

DEPARTMENT OF TRANSPORTATION

The National Highway Traffic Safety Administration (NHTSA), part of the Department of Transportation, regulates automobile safety and administers traffic safety programs. Because alcohol is the single largest factor involved in highway auto deaths and injuries, NHTSA has targeted as its primary risk group young people aged 15 to 20 (the age group with the highest ratio of accidents attributed to alcohol).

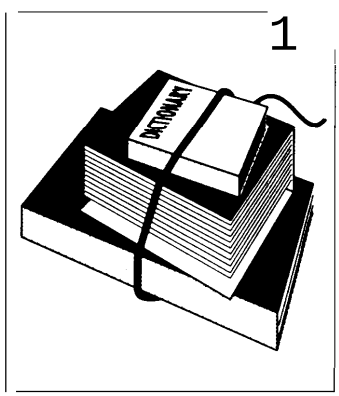
NHTSA'S programs fall under two categories-deterrence programs and prevention programs. Deterrence programs include advocating for the passage of State laws in a number of areas, including: immediate suspension of licenses for driving under the influence of alcohol, lowering the blood alcohol level at which it is illegal to drive to .08 (all States except five currently have a standard of O. 10), prohibiting open containers of alcohol in cars, prohibiting consumption of alcohol in automobiles, sobriety check points, provisional licensing (e.g., laws creating restrictions on new drivers such as daylight-only driving), zero tolerance (e.g., laws making it illegal for a minor to have any level of alcohol in his/her blood), and improved enforcement of laws already in effect (e.g., minimum age alcohol purchase laws). Prevention programs include public information and education programs aimed at schools, employers, and programs aimed at responsible use of alcohol. NHTSA created the Techniques for Effective Alcohol Management (TEAM) program, and has worked with the Ad Council in creating public service announcements on drinking and driving. NHTSA has also collaborated with other federal agencies to identify communication strategies to reach young persons at high risk for health-related problems (with HHS' Office for Disease Prevention and Health Promotion), and to develop workshops for school-based programs (with the Department of Education and HHS' CSAP.

C Appendix C: Perspectives on Defining Substance Abuse

Four broad arenas that encounter substance abuse-related issues include, mass communications, criminal justice, medicine, and public health. These entities often operate independently of one another and use substantially different terms when describing the use of illicit substances or the illegal use of licit substances.

MASS COMMUNICATIONS

The traditional realm of mass communications includes television, radio, and popular journals and newspapers. Within these media, the term substance abuse has become a catch-all phrase, with no clear boundaries. Much of the general public has become familiar with the term substance abuse within this ambiguous context.



CRIMINAL JUSTICE

While it is well-known that many crimes are committed by persons with substance use disorders and that these disorders can be major contributors to their crimes, there is no systematic policy within the criminal justice system for the evaluation of these disorders. In many jurisdictions, whether federal, state, or local, the prevailing sentiment is that *any use* of an illicit substance and/or use of a licit substance in an illegal manner, is considered criminal abuse. A limited set of quantitative analyses including blood, urine, and breath tests can be performed to detect illegal levels of alcohol and/or the presence of illicit substances. The Blood Alcohol Concentration (BAC) is 0.10 grams/deciliter for all States excluding Oregon, California, Utah, Vermont, and Maine, where the level is 0.08 grams/deciliter. As of December 1992, 15 states had lower BAC levels for youthful offenders charged with driv-

ing while intoxicated. These levels range from 0.00-0.02 grams/deciliter, which is considered "zero tolerance," up to *0.04* grams/deciliter (6). The alcohol breath test, while a different procedure from the BAC, converts the results into BAC units. Thus, the levels of intoxication for BAC and breath test are identical.

However, there are limitations to these analyses. In some jurisdictions, these tests can be performed only with the written consent of the person. In others, the urine test measures the presence of only one or two drugs rather than looking for the entire range of abusable substances.

Besides the limited amount of testing and evaluation, there is little use of psychological screening examinations or structured interviews to determine the level and severity of use, abuse, or dependence.

PUBLIC HEALTH

The traditional public health model incorporates the host-agent-environment relationship. Each of these factors has an individual, as well as an interrelated role in the potential use and/or harmful use of a substance.

Host factors may include possible genetic, psychological, and biological susceptibility. Agent factors incorporate the substance's abuse liability capacity, as well as how the substance is marketed. Last] y, environmental factors encompass not only the availability of the substance, but the social, cultural, political, and economic climate as well (3,4).

Over the past 20 years, professionals within the field of public health have attempted to reemphasize the strict medical concept of substance abuse. Attention had previously focused almost exclusively on individual drug use patterns, rather than featuring the diverse problems of drug, alcohol, and tobacco use as being intimately tied into communities and society as a whole.

Even the term "substance abuse" has come under scrutiny. While the word "substance" may at first appear quite generic, in many fields, this term has come to incorrectly infer illicit drug use—reinforcing the misperception of many individuals that alcohol and tobacco are not drugs. "Abuse" generally denotes the more severe forms of addiction. In reality, there is a continuum that begins with initial drug use and may progress to harmful use and addiction, with various problems present along the spectrum. In lieu of the term '*abuse," public health professionals prefer terms such as "alcohol and drug problems" or the ● *harmful/hazardous use" of a drug.

The focus of the public health perspective is to understand the importance social norms, environment, and availability play in the shaping of alcohol- and drug-related problems both on an individual and societal level.

MEDICAL

Within the fields of medicine, the two most frequently cited texts for the definitions of substance abuse and dependence are the *Diagnostic and Statistical Manual of Mental Disorders (DSM) is*sued by the American Psychiatric Association and the *International Classification of Diseases* (ICD) published by the World Health Organization (WHO). Each successive version of the DSM and ICD has been given a number signifying its order in the overall sequence of manuals; DSM uses Roman numerals and ICD uses ordinary numbers. The newest version of ICD, ICD-10, was published in 1992. The current version of DSM is the Third Edition-Revised (DSM-III-R), which will shortly be superseded by DSM-IV.

ICD

While the current ICD and DSM definitions of substance dependence are nearly identical, the two manuals differ sharply on the concepts of abuse, which ICD classifies as harmful use.

The ICD manual is intended to be used on an international basis, and the socially defined "American" criteria present in the DSM manual for substance abuse cannot be adequately transferred to a wide range of cultures. The current ICD-10 category of harmful use, while applicable cross-culturally, is limited to: "A pattern of psychoactive substance use that is causing damage to health. The damage may be physical (as in cases

of hepatitis from the self-administration of injected drugs) or mental (e.g., episodes of depressive disorder secondary to heavy consumption of alcohol).”

DSM

In the early 1950s the first DSM manual grouped alcohol and drug use disorders under the broad category of ‘*Sociopathic Personality Disturbances.” At that time, a substance use disorder was considered a moral weakness or the manifestation of a “deeper” psychological problem, rather than a disorder in-and-of itself with social, psychological, and perhaps even genetic determinants.

Throughout the 1970s and 1980s clinical research identified the need for separate categories for substance use disorders. The DSM-III manual, in 1980, was the first manual in this series to clearly identify substance abuse and dependence as pathological conditions different from substance use alone. DSM-III also alluded to the fact that social and cultural factors are contributors to the onset and continuation of abuse and dependence. The DSM-III definition of dependence emphasized tolerance (needing to take much higher doses of the substance to obtain the same effect) and withdrawal (having a distinct pattern of physiological arousal upon abrupt discontinuation or reduction in dosage), and required the presence of one or both of these phenomena to make a dependence diagnosis. Substance abuse was defined as problematic use with social or occupational impairment, but with the absence of significant tolerance and/or withdrawal. In both disorders, impairment in social and occupational function was a prominent aspect of the definitions, creating a significant overlap between the criteria for substance abuse and dependence. In 1987, DSM-III was revised (DSM-III-R) to give the behavioral aspects of substance use disorders equal weight to the physiological components.

This shift away from the physiological to the behavioral elements of dependence was strongly influenced by the work of researchers Edwards and Gross, who had extensively studied persons with alcohol problems. These researchers conceptualized alcohol dependence as a syndrome of graded severity that involved an interconnected complex of behavioral, psychological, and physiological elements associated with loss of control over alcohol consumption.

Contributing to the emphasis on behavioral aspects of dependence was work by Brady, Thompson, and others who had shown that animals can be taught to self-administer substances of abuse. Once taught, it was observed that most animals will expend tremendous amounts of energy to obtain additional doses and that this “drug-seeking behavior” is very difficult to extinguish. Efforts to repeat drug self-administration were especially prominent if the experimental drug was one with a high abuse liability such as morphine, methamphetamine, or (especially) cocaine and was difficult to extinguish.

This body of work was among the first in a line of investigation studying the behavioral aspects of drugs. This field of research became known as “behavioral pharmacology” and was strengthened by additional studies by Olds and others.

Thus, both the work of Edwards and Gross, that of behavioral pharmacologists, and of basic scientists pointed toward the presence of a definable and independent syndrome that can result after an organism has learned to self-administer abusable substances. This syndrome was not dependent on the ability of the drug to produce tolerance and withdrawal, but rather on its positive reinforcing effects. These effects were evident by observing the behavior of the organism, and could be measured by quantifying the work that the organism would produce to obtain the substance.

The development of the substance use disorders section for DSM-IV began in 1988 and involved the most extensive process yet undertaken for such a task. The major change in DSM-IV is in the definition of substance abuse. Unlike DSM-111 and DSM-III-R, DSM -IV clearly separates the criteria for dependence from those of abuse. Dependence in DSM-IV is a syndrome involving compulsive use, with or without tolerance and withdrawal; abuse is problematic use without

compulsive use, significant tolerance, or withdrawal. Preliminary data from the DSM-IV field trials indicate that this change will probably increase the number of persons diagnosed as having substance abuse, especially for those using hallucinogens, inhalants, sedatives, and amphetamines.

Substance Use and the Transition to Abuse/Harmful Use or Dependence

One problem in developing criteria for this second, nondependent category, whether called abuse or harmful use, is that though dependence has been well-studied, the progression from use to abuse has not been adequately researched (except in the case of alcohol); and depending on the perspective, may not always be linear. For example, using the DSM-IV classifications, it is possible that substances such as opiates may follow a path that begins with use and progresses to dependence before abuse-related problems are identified. Within the field of alcohol research, the consensus of studies is that consuming three to four standardized drinks/day by males (equal to 40 or more grams of alcohol at 12 grams/drink) is associated with an increased probability for the development of problems. As females tend to absorb alcohol more quickly, studies have shown that problems typically begin at about two to three drinks/day (1 ,2,5).

Little work has been done on other substances. All persons who end up with abuse, harmful use, or dependence begin with use. Use of a substance, whether licit or illicit, does not constitute a substance use disorder even though it may be unwise and strongly disapproved of by family, friends, employers, religious groups, or society at large. Use by itself is not considered a medical disorder. For a disorder to be present, use must become something else such as: occur more frequently; occur at higher doses; or result in a magnitude of problems. Though there have been some conceptual models developed for how one might approach a better understanding of this transition, there are few data available to clearly point out where the border lies.

DSM-IV AND ICD-10 DEFINITIONS

▮ DSM-IV Diagnostic Criteria:

Abuse

A. A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one or more of the following occurring over the same 12-month period:

1. Recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to substance use; substance-related absences, suspensions, or expulsions from school; neglect of children or household).
2. Recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use).
3. Recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct).
4. Continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with spouse about consequences of intoxication, physical fights).

B. Has never met the criteria for Substance Dependence for this substance.

Dependence:

A maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three or more of the following occurring in the same 12-month period:

1. Tolerance, as defined by either of the following:
   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 of the following:
   a. the characteristic withdrawal syndrome for the substance
   b. the same (or 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 was intended
4. Any unsuccessful effort or a persistent desire to cut down or control substance use
5. A great deal of time is spent in activities necessary to obtain the substance (e.g., visiting multiple doctors or driving long distances), use of the substance (e.g., chain-smoking), or recover from its effects
6. Important social, occupational, or recreational activities given up or reduced because of substance use
7. Continued substance use despite knowledge of having had a persistent or recurrent physical or psychological problem that is likely to be caused or exacerbated by the substance (e.g., current cocaine use despite recognition of cocaine-induced depression, or continued drinking despite recognition that an ulcer was made worse by alcohol consumption)

   Specify if:
   - **with physiological dependence:** Evidence of tolerance or withdrawal (i.e., either items (1) or (2) are present).
   - **without physiological dependence: No evidence** of tolerance or withdrawal i.e., neither items (1) nor (2) are present).

ICD-10 Diagnostic Criteria for Clinical Use:

Harmful Use:

A pattern of psychoactive substance use that is causing damage to health. The damage may be physical (as in cases of hepatitis from the self-administration of injected drugs) or mental (e.g., episodes of depressive disorder secondary to heavy consumption of alcohol).

The diagnosis requires that actual damage should have been caused to the mental or physical health of the user. Harmful patterns of use are often criticized by others and frequently associated with adverse social consequences of various kinds. The fact that a pattern of use 01 particular substance is disapproved of by another person or by the culture, or may have led to socially negative consequences such as arrest or marital arguments is not in itself evidence of harmful use.

Acute intoxication or "hangover" is not in itself sufficient evidence of the damage to health required for coding harmful use. Harmful use should not be diagnosed if dependence syndrome, a psychotic disorder, or another specific form of drug- or alcohol-related disorder is present.

Dependence Syndrome

A definite diagnosis of dependence should usually be made only if three or more of the following have been experienced or exhibited at some time during the previous year:

1. A strong desire or sense of compulsion to take the substance.
2. Difficulties in controlling substance-taking behavior in terms of its onset, termination, or levels of use
3. A physiological withdrawal state when substance use has ceased or been reduced, as evidenced by: the characteristic withdrawal syndrome for the substance; or use of the same (or closely related) substance with the intention of relieving or avoiding withdrawal symptoms.
4. Evidence of tolerance such that increased doses of the psychoactive substance are required in order to achieve effects originally produced by lower doses (clear examples of this are found in alcohol- and opiate-dependent individuals who may take daily doses sufficient to incapacitate or kill nontolerant users)
5. Progressive neglect of alternative pleasures or interests because of psychoactive substance use, increased amounts of time necessary to obtain or take the substance or recover from its effects.

6. Persisting with substance use despite clear evidence of overtly harmful consequences, such as harm to the liver through excessive drinking, depressive mood states consequent to periods of heavy substance use, or drug-related impairment of cognitive functioning; efforts should be made to determine that the user was actually, or could be expected to be, aware of the nature and extent of harm.

Narrowing of the personal repertoire of patterns of psychoactive substance use has also been described as a characteristic feature (e.g., a tendency to drink alcoholic drinks in the same way on weekdays and weekends, regardless of social constraints that determine appropriate drinking behavior).

It is an essential characteristic of the dependence syndrome that either psychoactive substance taking or a desire to take a particular substance should be present; the subjective awareness of compulsion to use drugs is most commonly seen during attempts to stop or control substance use. This diagnostic requirement would exclude, for instance, surgical patients given opioid drugs for the relief of pain, who may show signs of an opioid withdrawal state when drugs are not given but who have no desire to continue taking drugs.

The dependence syndrome may be present for a specific substance (e.g., tobacco or diazepam). for a class of substances (e.g., opioid drugs), or for a wider ranger of different substances (as for those individuals who feel a sense of compulsion regularly to use whatever drugs are available and who show distress, agitation, and/or physical signs of a withdrawal state upon abstinence).

The diagnosis of the dependence syndrome may be further specified by the following (the following roughly correspond to the course modifiers and relapse section of DSM-IV):

- Currently abstinent.
- Currently abstinent, but in a protected environment (e. g., in hospital, in a therapeutic community, in prison, etc.).
- Currently on a clinically supervised maintenance or replacement regime (controlled dependence, e.g., with methadone; nicotine gum or nicotine patch).
- Currently abstinent, but receiving treatment with aversive or blocking drugs (e. g., naltrexone or disulfiram).
- Currently using the substance (active dependence).
- Continuous use.
- Episodic use.

D Appendix D: List of Contracts

For this assessment, OTA commissioned reports on various topics relevant to substance abuse and addiction. The manuscripts of 10 of these contractors are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; (703) 487-4650.

- "Substance Abuse and Addiction: Genetic Components," Stephen H. Dinwiddie and Theodore Reich, Jewish Hospital of St. Louis, St. Louis, MO; William J. McBride, Indiana University School of Medicine, Indianapolis, IN, (PB94-1 75694).
- "Drug Abuse in Schools: Contributing Factors and Preventive Interventions," William B. Hansen, Bowman Gray School of Medicine, Wake Forest University, Winston-Salem, NC (PB94-175635).
- "The Contribution of Drug Availability to Drug Use and Abuse," National Center for Juvenile Justice, Pittsburgh, PA (PB94-175676).
- "Assessment of Dependence Liability of Psychotropic Substances: Nature of the Problem and the Role of the College on Problems of Drug Dependence," Theodore J. Cicero, Washington University School of Medicine, St. Louis, MO (PB94-175643).
- "Defining Substance Abuse," George E. Woody, Philadelphia Veterans Administration Medical Center and University of Pennsylvania, Philadelphia, PA (PB94-175650).
- "Factors Contributing to Drug Abuse in Workplaces," Frank Baker, Baltimore, MD (PB94-175627).
- "Research on the Family Setting's Role in Substance Abuse," Brenna H. Bry, Rutgers University, Piscataway, NJ (PB94-175692).

- "The Role of Ethnography in Understanding and Preventing Drug Abuse," Mitchell S. Ratner, TIGER Research, Takoma Park, MD (PB94-175668).
- "The Role of Poverty in Drug Abuse," The Urban Institute, Washington, DC (PB94-174000).
- "The Role of Recreational, Cultural, and Other Community Activities and Settings in Preventing Drug Abuse Among Youth," Center for Youth Development and Policy Research, Washington, DC (PB94-175619).

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G Appendix G: References

CHAPTER 2: INTRODUCTION

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CHAPTER 8: COMMUNITY ACTIVITY SETTINGS

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