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Background Papers on Drug Abuse Financing and Services Research

Drug Treatment Modalities: A Taxonomy To Aid
Development of Services Research

Treatment Capacity For Drug Problems in the U.S.: Public
Policy in a Fragmented Service System

Cost-Effectiveness Analysis of Drug Abuse Treatment:
Current Status and Recommendations for Further Research

Drug Abuse Among Workers and Employee Assistance
Programs

Defining the Public Interest in Workplace Drug Abuse Policy

Targeting Special Populations With Drug Abuse Problems:
Pregnant Women and Infants

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Alcohol, Drug Abuse, and Mental Health Administration

National Institute on Drug Abuse
Division of Applied Research
Financing and Services Research Branch
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NIDA DRUG ABUSE SERVICES RESEARCH SERIES

The *Drug Abuse Services Research Series* is issued by the National Institute on Drug Abuse's (NIDA) Financing and Services Research Branch within the Division of Applied Research. The National Institute on Drug Abuse is the Federal agency with primary responsibility for research on drug abuse. Such research includes the biological, pharmacological, psychological, and sociocultural aspects of drug abuse.

NIDA's Financing and Services Research Branch is responsible for coordinating and conducting research, demonstration, and evaluation studies on the capacity, efficiency, effectiveness, organization, structure, and financing of drug abuse treatment programs and delivery systems. The *Drug Abuse Services Research Series* disseminates the latest drug abuse treatment services research on a range of topics, including quality of care, financing, and cost-effectiveness.

NIDA wishes to express its appreciation to the many members of the scientific and treatment community who reviewed the papers and reports in this issue as well as to the authors of these reports.

The views and opinions expressed in this issue are solely those of the authors and do not necessarily constitute an endorsement, real or implied, by the National Institute on Drug Abuse or any other part of the U.S. Department of Health and Human Services.

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FOREWORD

Services research has recently come to be recognized as a critical component in the study and improvement of the health care system. Multidisciplinary in nature, such research is concerned with treatment effectiveness, efficiency and quality of care as it relates to the system's organization, financing and management. Services research focuses on developing knowledge to inform those charged with decisions regarding access to health care, and the design, management, reimbursement and delivery of health care services.

The demand for services research in the drug abuse field has intensified with the growing involvement of Government in financing, planning, and studying of drug abuse treatment options to help reach the Nation's demand reduction goals. The passage of the Comprehensive Alcohol Abuse, Drug Abuse, and Mental Health Amendments Act of 1988 (P.L. 100-690) placed new emphasis on services research. In addition, this Act added Section 1922 to the Public Health Service Act. This new section mandates the evaluation of alcohol and drug abuse treatment programs, especially the assessment of the quality, appropriateness, and costs of various treatment forms for specific patient groups.

As the lead Federal agency in drug abuse research, the National Institute on Drug Abuse (NIDA) supports both basic and applied research. The Institute recognizes that there are a variety of public and scientific concerns related to drug abuse services research. These include studies of the means of increasing access to efficient

drug abuse services, the appropriate drug abuse treatment regimens for special populations, the optimal means of maximizing treatment retention and effectiveness, the relative cost and effectiveness of alternate drug treatments, manpower and credentialing issues in the drug abuse services system, and the impact of financing and reimbursement decisions on the delivery of drug abuse care. In response to the needs of the drug abuse scientific community, treatment providers, and the Federal mandates, NIDA has developed a drug services research plan. This plan addresses these many service research needs and complements NIDA's other drug abuse treatment and prevention research efforts.

In addition to the scientific study of drug abuse in all its complexities, NIDA's mission includes the dissemination of its research findings to researchers, practitioners, program planners and policymakers. NIDA is committed to stimulating and maintaining a dialog between the research community and the drug abuse services delivery system. The *Drug Abuse Services Research Series* is an integral part of NIDA's response to these needs. The reports in this series will not only add to our knowledge base but also indicate opportunities for further research. We hope that the members of the drug abuse field will find this *NIDA Drug Abuse Services Research Series* useful and will increase their attention to drug abuse services research.

Charles R. Schuster, Ph.D.
Director
National Institute on Drug Abuse

INTRODUCTION

This is the first issue of the National Institute on Drug Abuse's (NIDA) *Drug Abuse Services Research Series*. The *Series* is designed to disseminate current methodological developments and research findings supported by NIDA regarding the drug abuse service delivery system. This *NIDA Services Research Series* is both a recognition of the contributions made by the drug abuse services research of earlier years and a commitment to foster rigorous services research to deal with drug abuse in the 1990s.

In the 1970s and early 1980s, drug abuse services research emphasized the etiology of drug addiction, the efficacy of available treatment and aftercare models, and strategies such as vocational rehabilitation, therapeutic communities, and service delivery by paraprofessionals. By the mid-1980s, however, there were changes in the types of drugs being abused, the characteristics of the drug-using population, and the impact of drug use on society.

Corresponding changes were also taking place in the organization and delivery of drug abuse services. These many changes require new research regarding the relative efficiency and effectiveness of alternative treatment for the various subgroups of current drug abusers: What is the appropriate constellation of services, provided by whom, at what cost, for which clients, abusing what drugs? Currently the critical areas of drug services research identified in NIDA's plan include:

- (1) Client: Need, demand, utilization, characteristics, morbidity, and comorbidity;
- (2) Treatment Services: Capacity, price, utilization, access, organization and personnel;
- (3) Treatment Cost: Cost-effectiveness, efficiency, and quality;

- (4) Financing: Funding, reimbursement, insurance, and cost containment;
- (5) Drug Abuse Services In Context: Prevention, employment criminal justice, law enforcement, and other social system variables; and
- (6) Services Research Infrastructure: data development, statistics, and methods.

This first volume of NIDA's *Drug Abuse Services Research Series* assesses, from a services research perspective, the state of current knowledge, theory and research methods to address a number of these issues.

The first paper, by Saxe and Shusterman, deals with the importance of standardized and meaningful definitions of treatment. The authors propose a multidimensional taxonomy of drug treatment modalities that takes into account not only the treatment setting but also the technology and active ingredients of treatment necessary to further our understanding of treatment outcomes. They propose a conceptual schema that would identify the active content of treatment programs and permit valid comparisons of different treatments. Their taxonomy of drug treatment modalities takes into account several factors including treatment technology or type of therapy, treatment setting, client characteristics, treatment provider characteristics, and treatment duration.

Next, issues relating to current drug treatment capacity are addressed by Schlesinger, Dorwart and Clark. They begin by summarizing the evolution of the drug treatment system and perceptions of appropriate accessibility and treatment. They then present some measures of current treatment capacity and examine the relationship between need and capacity. Finally, they consider drug treatment in the broader context of the health and social services systems.

Cost-effectiveness analysis, as posited by the Apsler and Harding paper, is especially important in the current climate of increasing demand for drug treatment coupled with severely limited resources. Although the authors indicate the several components of cost-effectiveness analysis, they focus on the methodological issues confronting us as we conduct research to quantify the cost and outcomes of different treatment interventions. They provide a review of the literature, citing some of the methodological difficulties of earlier treatment outcome research, and suggest new analytic and design techniques to deal with such difficulties. This critical assessment of the available literature addresses a central services research question: What is the relative cost-effectiveness of different types of treatment? Finally, the provision of aftercare and the matching of clients to treatment are discussed in relationship to measuring the cost-effectiveness of different approaches to drug treatment.

Recognizing the importance of the workplace in dealing with the drug abuse problem, Tompkins describes drug use in the employed population, provides an overview of the role of Employee Assistance Programs (EAPs), and discusses related policy and research issues. The author distinguishes between those EAPs that focus on improving service access and utilization and those that perform managed care activities which try to contain treatment costs. He provides a framework for measuring and evaluating the performance of EAPs in the drug services delivery system, presents data on EAP utilization and potential effectiveness, and concludes with recommendations for future research.

Workplace policies regarding EAPs, insurance coverage, and drug testing are examined in the paper by McGuire, Ruhm and Shatkin. The authors begin by distinguishing between private and public interests in workplace drug abuse policies. They identify potential consequences of policies designed to alter drug-using behaviors and those policies designed to shift the costs of drug abuse from the employer. Their review of

workplace health insurance coverage concludes that workplace size is the primary determinant of coverage for drug abuse treatment and that drug abuse coverage is generally subjected to greater restrictions than coverage for other health conditions.

The final paper in this issue is by Horgan, Rosenbach, Ostby, and Butrica. The authors examine the state of knowledge, policy issues, and research questions regarding drug abuse treatment for pregnant women. They summarize the adverse effects of drug abuse on the mother, on pregnancy outcomes and the infant. In addition, they focus on issues relating to the impact of drug-using pregnant women on the service delivery system and the allocation of resources to meet the needs of this special population.

The papers in this issue were prepared for the first Advisory Committee meeting of NIDA's Center for Drug Abuse Services Research, held January 23-24, 1990 at Brandeis University. These papers are appropriate content for the first issue in this new NIDA series, because they examine services research methods and related background and theoretical formulations. They are offered to stimulate further development and applied research advances in the drug abuse services research field. We extend our appreciation to the many researchers, economists, practitioners, and other professionals who wrote and reviewed these papers.

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DRUG TREATMENT MODALITIES: A TAXONOMY TO AID DEVELOPMENT OF SERVICES RESEARCH

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Treatment for drug abuse has expanded substantially during the past decade although demand for treatment continues to far outstrip its availability (White House 1989). In terms of the number of individuals receiving services and the diversity of the treatment modalities used, more substance abuse treatment is now being provided. Not surprisingly, the cost of such drug abuse treatment has also grown substantially. It is estimated that at least \$2.5 billion a year is spent by public and private sources for drug abuse treatment. To deal effectively with the drug abuse problem, there is widespread agreement that we need to expand availability of treatment even further (White House 1989), but to do so we will have to develop more cost-effective means of providing treatment services.

To develop a more efficient and effective drug treatment system, a program of services research is needed to evaluate treatment systems and assess the relationships among treatment modalities, outcome research, and financing studies. This paper proposes a multidimensional taxonomy of drug treatment modalities that can be used to develop such a program of services research. The ultimate purpose of the taxonomy is to aid decisionmaking about the financing and reimbursement of drug treatments.

At present, drug treatment modalities are identified primarily by the setting in which treatment takes place (e.g., outpatient, inpatient) and, in some cases, by a central component of treatment (e.g., methadone; see Allison and Hubbard 1985; Anglin and Hser 1990). This paper departs from such typical descriptions of drug treatment modalities. The goal is to develop a multidimensional framework that considers the technology and active

ingredients of treatment as well as the setting. An underlying assumption of the proposed taxonomy is that treatment modalities cannot be adequately described without taking into account the characteristics of patients who are the focus of interventions, the providers who treat these patients, and additional elements such as the duration of treatment. Rather than generate a list of treatment modalities, the present strategy is to develop a conceptual schema designed to enable comparison of treatments. The taxonomy is designed to be used in considering the effectiveness of treatment and identifying the factors within a treatment program that are responsible for particular outcomes.

STATE OF KNOWLEDGE

There is widespread concurrence that better information is needed about treatment for substance abuse (cf. White House 1989; USDHHS 1987a); in particular, we need to know which treatments are effective under what conditions for specific individuals. As discussed by Apsler and Harding in this volume, this information needs to be made part of cost-effectiveness analyses so that decisionmaking about treatment can be made more systematic. Many reviewers agree that substance abuse treatment is effective, but there are wide variations in effectiveness for particular populations and programs (see, e.g., Anglin and Hser 1990). Effectiveness, in part, depends on which outcome one is considering, but for many of the most important questions about treatment effectiveness, there simply is no information.

An impediment to developing knowledge about drug treatments and programs is that extant analytical frameworks inadequately describe the range of treatments available and confound several critical treatment components. Until recently,

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when drug abuse treatment was discussed, three principal treatment modalities were identified (see, e.g., Allison and Hubbard 1985). As noted above, these modalities emphasize treatment settings rather than the underlying technology:

1. *Outpatient methadone maintenance.* Methadone maintenance is provided in programs that allow addicts to substitute prescribed methadone for illicit opiate use. According to Federal regulations, methadone can be provided only "in conjunction with provision of appropriate social and medical services."
2. *Therapeutic community (TC).* These communities are residential facilities that provide a highly structured and demanding social environment for addicts. "Fundamental to the TC concept is ... a total 24 hour community impact to modify permanently lifelong destructive patterns of behavior.... The basic goal is to effect a complete change in lifestyle" (DeLeon and Rosenthal 1979).
3. *Outpatient drug-free.* This modality includes a wide variety of treatment approaches that vary from nonprofessional (e.g., peer counseling) treatments to psychotherapy provided by physicians, psychologists, and social workers.

Although methadone maintenance, TCs, and outpatient treatment represent the three traditionally identified treatment modalities, two other forms of treatment have also been described in recent literature:

1. *Detoxification.* This is usually a short-term intervention that helps individuals physically withdraw from illicit drug use. Depending on the addiction and medical complexity of the addiction, drugs may be provided as part of detoxification.
2. *Inpatient chemical dependency treatment.* Such inpatient treatment is usually based in

hospitals or specialized psychiatric facilities. Programs are designed to last for 2-4 weeks, and actual treatment includes a panoply of pharmacological, psychotherapeutic, and other techniques (e.g., the 12-step Alcoholics Anonymous [AA] model) designed to help drug abusers change their patterns of behavior.

For policy purposes concerning the financing and reimbursement of treatment modalities, as well as for future research, there are a number of problems with such descriptions of treatment modalities. Typologies based primarily on the treatment setting confound several of the elements that comprise treatment modality and fail to identify the program elements essential for treatment efficacy. In addition, regardless of whether the list of treatments includes three or even five different modalities, such taxonomies do not take into account the range of treatment modalities currently available.

The principal problem with differentiating treatment modalities into categories such as outpatient methadone maintenance and outpatient drug-free is that treatment technology (to be referred to as "model") and treatment setting are confounded. For many treatments, their use is not restricted (at least theoretically, if not in practice) to a particular setting, and it is important to disentangle the treatment model from where the treatment is offered. Although some treatment models (e.g., TCs) are inextricably tied to a particular setting, this is not the general case. Even in the case of TCs, it is important to understand the techniques used to alter drug-use behavior and to differentiate the effect of the residential setting from other features of the TC treatment. A multidimensional analysis enables more focused evaluation and services research on drug treatments. Ultimately, such an analysis will enhance ability to make policy recommendations about the types of treatment that should be supported for particular clients.

In addition, the traditional differentiation of treatment into a small number of broad categories

based on characteristics of the setting does not help to assess the particular types of treatment that are provided within specific programs. As drug treatment programs become more widely available, there is increased heterogeneity as to the treatments incorporated within them, and broad distinctions become less useful. Inpatient chemical dependency programs, for example, may now include such a wide range of treatments and program elements that comparisons among them may have relatively little meaning. It is particularly so for comparisons involving their cost and cost-effectiveness.

Heterogeneity among programs is the result, in part, of treatment for drug abuse having to be expanded to deal with increases in abuse of substances such as cocaine. Thus, for example, methadone maintenance, rather than being one of three major modalities, needs to be viewed as part of a group of pharmacological agents that could be used in drug treatment. The specific agent depends on the abused substance. Similarly, there is a host of inpatient and residential treatment settings (from specialized beds in community hospitals and psychiatric facilities to non-TC residential settings) where treatment for drug abuse is provided, and these may differ drastically based on the type of drug problem treated. Outpatient approaches are, perhaps, even more variegated than residentially based treatments, and the number of treatments used today represents a diverse set of therapies. Current typologies reflect the emphasis, until recently, on heroin addiction as the principal drug abuse problem for which treatment was provided. Such treatment may, however, have only indirect relevance to the abuse of drugs such as cocaine.

MULTIDIMENSIONAL TAXONOMY

The taxonomy of treatment modalities to be developed below includes two principal dimensions: treatment model and treatment setting. Within each of these dimensions, several categories of treatment types are described, and

treatments identified by the literature are related to the framework. Several additional factors critical for understanding the application of treatment modalities are identified in a later section.

Treatment Models

As noted above, the most important dimension of treatment modalities is what will be referred to here as the "treatment model" (i.e., the "active ingredient" responsible for treatment efficacy). Because there is a large and ever-growing number of such technologies, the following discussion organizes treatment models into four broad categories: (1) psychosocial, (2) pharmacological, (3) educational, and (4) self-help.

In the discussion below, psychosocial treatments refer to psychotherapeutic techniques used by professional therapists (e.g., psychiatrists, psychologists) and, in some cases, certified drug counselors to aid substance abusers and addicts in understanding and changing their emotions, cognition, and behavior. Pharmacological treatments refer to the use of medications to help addicts maintain abstinence and prevent relapse. Educational treatments focus on teaching addicts skills so they can adapt in society without drug use. Self-help treatments are those techniques based on addicts (and former addicts) helping one another maintain abstinence from drugs and deal with personal problems. Each treatment model is considered independent of the setting in which it is offered, either singly or in combination with other models, as part of treatment programs.

Psychosocial Therapies

Psychosocial treatments are, perhaps, the most frequently employed formal treatment. Psychosocial treatments are also referred to as psychotherapies, and they include techniques based on psychoanalytic theory as well as therapies based on behavior modification principles and variants of cognitive therapy. Psychosocial therapies are used

both in individual treatment and as part of group and family therapies.

The goal of the "classic" psychosocial treatment, individual psychodynamic psychotherapy (a broad term for psychoanalytic therapy), is to address the painful emotions, difficult relationships, and impulsivity associated with substance abuse. Dynamically based therapies are designed to help addicts gain insight into the negative consequences of their drug abuse and find alternative methods of coping with their distress (Gold et al. 1986; Khantzian 1985; Woody et al. 1986).

Although in psychodynamic therapies the therapist plays a fairly restrictive role, in other psychosocial therapies the therapist takes on multiple roles. These include being an empathic listener, a limit setter, and, perhaps, a case manager for other services. Often grouped under a broad rubric such as psychotherapy, such treatments range from highly structured behavioral therapies to less structured cognitive and interpersonal therapies. In many cases, the early phase of psychotherapeutic treatments is pragmatic and directive, focusing on achieving abstinence (Washton 1986). Individual psychotherapy is often part of a comprehensive outpatient treatment program that requires urine testing and abstinence from use of mood-altering substances (Washton 1987).

Behavioral therapies, in particular, are widely used to treat substance abuse (see, e.g., Childress et al. 1985). Typically, such treatments use operant conditioning methods to modify and eliminate craving for drugs, although there is a long history of using techniques based on classical conditioning for the treatment of alcoholism. Operant behavior modification techniques range from the use of punishment, to relaxation and biofeedback training, to desensitization.

Particularly for those behavioral treatments based on an operant model, there are a number of variants. In each case, the focus is on training an individual (through reinforcement) to behave differently with respect to drug use. One variant

of behavior modification techniques, contingency contracting (Dolan et al. 1985; McCarthy and Borders 1985), involves establishing an explicit contract between patient and therapist. Contingency contracting is used most often for patients who have "something to lose" by continued drug use. Assertiveness and social skills training are other behavioral interventions designed to help a recovering addict readjust to a drug-free environment.

As noted above, classical conditioning procedures are also sometimes used to treat substance abusers (although their effects can also be explained by operant conditioning theories). Aversive conditioning treatments are one application of the classical conditioning model and involve aversive stimuli (e.g., induced nausea) being paired with drug use or drug-related behaviors. Systematic desensitization, in which patients are gradually exposed to anxiety-producing stimuli and are trained to cope with their anxiety without using drugs, is another version of classical conditioning.

An additional set of psychosocial treatments is based on cognitive models. These include cognitive behavior therapy (cf. Beck 1979) and interpersonal psychotherapy (Rounsaville et al. 1985). Individual cognitive behavioral therapy has been used with drug abusers to counter the irrational thinking that contributes to substance abuse (Woody 1983). Interpersonal psychotherapy was originally used to treat patients with affective disorders but has recently been modified to treat cocaine abusers.

Several forms of nonindividual therapy are also employed in drug treatment programs. Group therapy, for example, is widely used as an integral component of treatment programs (see Brunner-Orne 1956). Professionally led recovery groups provide an opportunity to learn about and cope with such common problems as drug craving and distorted thinking that lead to "slips" in abstinence and relapses. These groups provide many of the elements of support, inspiration, and confrontation of self-help groups (see below). Group leaders and other members further along in recovery

provide positive role models to replace those in the abuser's home environment. Such treatment programs have been used with opiate addicts (see McAuliffe et al. 1986) as well as cocaine addicts.

Another nonindividual treatment, family therapy, addresses patterns of family behavior that encourage a patient's substance abuse or can be used to help the abuser become drug free (Stanton et al. 1982). The family can be enlisted to set limits on the patient's use of drugs and to support the patient's efforts to find an alternative, drug-free lifestyle. Family therapy has been widely used with opiate addicts and, more recently, with other nonopiate drug abusers.

Pharmacological Treatments

In recent years, a host of treatments using pharmacological agents has been employed to treat drug abuse. Pharmacological treatments are rarely provided in the absence of other forms of treatment. Pharmacological agents are variously used to deal with symptoms of withdrawal, to maintain drug abstinence, and to prevent relapse.

Pharmacological agents are often used as part of detoxification, often necessary as the first stage of a drug treatment program (cf. U.S. DHHS 1987a). During detoxification, the patient experiences withdrawal symptoms, usually the opposite of the effects produced by use of the drug. Thus, for example, whereas cocaine produces an euphoric state, withdrawal results in fatigue and depression. In some cases--for example, withdrawal from dependence on sedatives--detoxification can be life threatening and leads to medical complications. Withdrawal from both opioids and nonopioid narcotic analgesics is less medically dangerous but can produce intense discomfort.

Several pharmacological agents are used to ease withdrawal and help avoid medical complications. Clonidine (Gold et al. 1986), for example, is used to reduce the symptoms of opiate withdrawal. For cocaine withdrawal, a number of antidepressants have been tried, both to reduce depressive

symptomatology and to decrease craving (Gawin and Kleber 1988). In some cases, particularly with barbiturate withdrawal, detoxification involves slowly reducing the amount of the drug.

Currently, probably the most important application of pharmacological treatment is the use of methadone for abusers of opiates such as heroin. Methadone is an opiate that prevents symptoms of opiate withdrawal, but at typically prescribed doses, it does not produce the level of sedation or euphoria that results from heroin use. Methadone maintenance programs are frequently used on a long-term basis, often for 12 months or more (U.S. DHHS 1987a). They enable recovering drug addicts to focus on their social and vocational rehabilitation and to become reintegrated into society, even though they are still addicted to an opiate. These programs also, in effect, substitute one drug (methadone) for another (heroin)--often on a long-term basis.

Methadone maintenance treatment programs differ among one another in their emphasis on supportive services and their focus on abstinence (Allison and Hubbard 1985). Although Federal regulations constrain them to provide both types of services, the difference in orientation is what Graff and Ball (1976) refer to as "metabolic" and "psychotherapeutic" treatment models. The metabolic model treats drug abuse as a medical problem, using methadone to alleviate the problem and, perhaps, including psychotherapy in the treatment program. The psychotherapeutic model treats drug abuse as a symptom or manifestation of an underlying emotional disorder. Methadone and other chemicals are used as an adjunct to psychotherapy and are expected to be used only temporarily (Allison and Hubbard 1985).

There is considerable controversy about methadone maintenance (see, e.g., Allison and Hubbard 1985; Liappas et al. 1988), primarily about its goals and its effectiveness. What seems clear from the debate is that methadone maintenance is not a unitary treatment modality. Providing methadone is only one aspect of the treatment, and there is substantial variation in program philosophy as well

as in such details as dosage level and type of counseling. Given such variations among programs, it is difficult to consider methadone maintenance as a single entity.

No medication has received widespread use for treating addiction to nonopiates such as cocaine and its derivatives (e.g., "crack"), which now appear to be more prevalent than heroin (White House 1989). Significant progress is being made, however, in identifying the neurophysiological action of cocaine on the brain, and such research may lead to the development of a blocking agent. Cocaine, it is believed, binds to the areas of the brain that are richest in receptors for the neurotransmitter and blocks the reuptake of dopamine, producing a tremendous high (see Holden 1989). Currently, the most promising drug that blocks cocaine craving is buprenorphine, a mixed-opiate agonist-antagonist that works like methadone when given to heroin addicts (Mello et al. 1989).

Research on other cocaine-blocking drugs is also under way. Preliminary research with flupenthixol decanoate has shown it to be effective as an antidepressant in low doses and as a neuroleptic in higher doses. It appears effective in ameliorating cocaine withdrawal symptoms (Gawin et al. 1989). Medications such as amantadine (a dopamine agonist) and bromocriptine have been shown to reduce symptoms of cocaine withdrawal such as cocaine craving, lack of energy, depression, and insomnia (Tennant and Sagerian 1987). Tricyclic antidepressants may be helpful in alleviating substance abuse in cocaine addicts with underlying depression (Tennant and Sagerian 1987). For cocaine addicts experiencing hallucinations and paranoid symptomatology, antipsychotic medications such as haloperidol may be used (Wesson and Smith 1985).

Educational Model

A very different type of drug abuse treatment is represented by educational approaches. Such treatment involves a variety of didactic techniques

to educate substance abusers about the causes, natural history, and effects of substance abuse. In addition, educational approaches provide training in social and vocational skills. It is believed that providing alternatives to the drug abuser's lifestyle will enable the abuser to sustain abstinence. Typically, educational approaches are an integral part of drug treatment programs that involve multiple treatment models.

Self-Help Model

The most popular self-help programs for treatment of drug abuse are programs such as Narcotics Anonymous and Cocaine Anonymous, which are based on the 12 steps of AA (see, e.g., Alcoholics Anonymous 1978; Brown 1985). The 12 steps are a series of statements that provide a guideline to recovering fully from substance abuse. They involve such acts as admitting one's powerlessness over substance abuse, submitting oneself to a "higher power" for guidance, taking a moral inventory of one's behavior, and making amends to others for the wrongs one has done to them. Members attend group meetings to discuss their past difficulties and to seek and offer support, advice, and inspiration to help one another maintain abstinence and live with greater satisfaction and inner peace. Experienced members volunteer to be personal counselors, or "sponsors," of newer members. Membership provides a new social network to replace the substance abuser's circle of drug-abusing friends.

Twelve-step programs are conducted by the members themselves, rather than by professionals, and are usually operated independent of treatment programs. Calling themselves "spiritual" programs, 12-step programs represent a way of life or a therapeutic subculture (Zinberg and Fraser 1979) and therefore are not actually a treatment model. They are, however, often a component of formal treatment and aftercare planning. Narcotics Anonymous programs, for example, are offered free of charge and are widely available to anyone with a desire to abstain from substance abuse. Thus, because of their widespread availability and

their role in treatment programs, they will be considered a treatment modality.

There are a number of other programs that might be considered self-help treatments; however, because they *do* rely on professional staff, they are dissimilar from 12-step-type programs. The most important of these are TCs, in which residents help one another maintain drug abstinence. TCs are discussed in more detail below, under "Treatment Settings." Other self-help programs include a variety of counseling and educational interventions that involve former addicts and peer counselors. Some of these programs focus on education and prevention, some on rehabilitative treatment, and others on relapse prevention.

Treatment Settings

Although some treatment models, especially TCs, are inextricably related to the treatment setting, it is not so for the vast majority of treatments. Each of the treatment models described above can, under most circumstances, be used in a variety of settings. Those settings may be as diverse as psychiatric hospitals, general care hospitals, clinics, private physicians offices, and even schools and workplaces (cf. Schlesinger et al. 1990). The implications of providing treatment in each of these settings, for both effectiveness and costs of treatment, can be considerable.

A broad distinction can be made between residential and nonresidential treatment settings for substance abusers; however, because substantial differences among treatment settings exist within each of these broad categories of settings, this differentiation is not very useful. Residential settings, used here to mean any domiciliary facility, include both TCs and community hospitals. The following discussion describes several of the most important settings for treatment in terms of both their characteristics and their relationship to particular treatment models.

Hospitals

Various types of hospitals provide substance abuse treatment (see Schuckit 1985). General hospitals treat the acute medical conditions, such as toxicity and trauma, that are associated with abuse of certain substances and also provide detoxification and short-term rehabilitative treatment. Recently, community and general hospitals have also become involved in rehabilitative treatment of substance abuse in specialized chemical dependency units. In addition, hospitals have developed variants of 24-hour-a-day residential programs; such partial hospitalization programs provide addicts/substance abusers with a structured setting as well as medical monitoring.

Specialized chemical dependency units also exist on a stand-alone basis or as part of stand-alone psychiatric hospitals. Such hospital settings typically provide more long-term treatment and often have structured programs that last from 3 to 4 weeks or longer (see Allen 1989). Some of these programs specialize in drug abuse, some include alcohol treatment, and there are probably various mixed-type settings. In terms of actual services, these programs (e.g., the Hazelden Foundation in Minnesota) typically focus on the treatment engagement and abstinence induction phases and last between 4 and 10 weeks. The inpatient environment is used as a therapeutic milieu, and treatment includes applying a variety of models. The guiding principle is "treating the whole person," and the patient is engaged in a variety of social, educational, and psychotherapeutic activities.

A recent development in hospitalization is the increased specialization of hospital units, whereby child substance abusers are treated separately from adult substance abusers (see, e.g., Wilson and Lyman 1983) and units are established specific to the type of drug problem (see Schlesinger et al. 1990).

Therapeutic Communities

Similar to hospitals in their residential character but very different in orientation, TCs have played an important role in providing drug treatment (DeLeon et al. 1982). They provide substance abusers with an environment to replace their home environment, which often supports substance abuse. Although the atmosphere of these residential facilities can vary greatly, TC residents typically live together and help one another through mutual reinforcement, companionship, and social pressure. Interactions among members are used to strengthen and reinforce continued abstinence and to eliminate antisocial behaviors.

At a TC, former addicts, rather than professional or medical staff, are typically employed as counselors, administrators, and role models. The atmosphere is often highly structured so that clients progress through clearly delineated stages that carry successively more responsibility and personal freedom. All members are assigned work duties, and the level of responsibility is determined by the member's position in the community. Advanced members may be employed or enrolled in school or in job-training programs outside the community (Allison and Hubbard 1985).

Exemplar TCs include Daytop Village in Staten Island, NY; Synanon in California; and Phoenix House in New York City. Recently, these programs have had long waiting lists, despite current efforts to make them more available (White House 1989). Lack of startup funds, along with community resistance to proposed sites, have impeded development of additional TCs.

Halfway Houses

Halfway houses, sometimes referred to as recovery houses, were originally created to serve alcoholics but are now often available to abusers of a wide range of illicit substances. Their distinctive feature is that they are community-based, nonmedical facilities. Halfway houses are full-time residential facilities that provide food; shelter;

and vocational, recreational, and social services in a supportive atmosphere.

Like TC participants, halfway house residents are expected to help one another and provide mutual reinforcement to maintain abstinence from drugs. Typically, residents leave the facility during the day and sometimes on weekends to seek employment and become active participants in the community. Several variants of halfway houses, including quarterway and three-quarterway houses, also exist and often operate in conjunction with hospitals that provide detoxification treatment.

Outpatient Settings

Although most funds spent on substance abuse treatment go to inpatient and residential care, the vast majority of those individuals who are currently receiving treatment (approximately 85 percent; U.S. DHHS 1987a) are in nonresidential, outpatient treatment settings. Such facilities range from drop-in "rap" centers to clinics and private offices of physicians, psychologists, and social workers. These community-based settings are particularly useful for individuals who are motivated and able to continue to function at their jobs or school. However, although these settings share a nonresidential character, they may have little in common with one another.

Given that individuals treated in outpatient settings often receive treatment in private settings (which typically do not participate in the National Drug and Alcoholism Treatment Unit Survey [NDATUS]) and/or have comorbid conditions that are the primary focus of treatment, it is difficult to know just how extensively treatment for substance abuse is provided. Public facilities range from community mental health centers to methadone maintenance centers to public hospital outpatient clinics. Private facilities include clinics, offices of both general medical practitioners and psychiatrists, and offices of mental health providers such as clinical psychologists and social workers.

Recently, there has been increased interest in providing both preventive and treatment services at schools and places of employment. Although these settings often serve merely to refer substance abusers to other facilities, they sometimes provide treatment that emphasizes educational and preventive interventions.

PATIENT CHARACTERISTICS, HEALTH PROVIDERS, AND TREATMENT DURATION

Treatment model and treatment setting are the two primary dimensions of treatment modalities; nevertheless, any understanding of the variation in modalities is incomplete without attention to the characteristics of the patients, their health providers, and the duration of treatment. The following discussion describes the factors associated with these additional dimensions of treatment.

Patient Characteristics

The characteristics of the patient being treated for drug abuse, and particularly the nature of the patient's substance abuse problem, play a central role in determining which type of treatment will be appropriate as well as what it will cost. Determining which type of treatment is most appropriate for particular patients is key to maximizing the cost-effectiveness of drug treatment. As the character of drug abuse changes (e.g., as cocaine abuse becomes more prominent than heroin abuse), approaches to drug treatment may need to be altered (see, e.g., Shulman 1987).

Abuse Problem

The most important characteristic of substance abusers that differentiates them from one another and has implications for treatment is the type of illicit or licit drug they are abusing. Along with knowing the severity of their abuse and level of

dependency, knowing the type of drug will affect both the model of treatment and the setting necessary for treatment. It is not yet clear how tailored drug treatment must be for the particular substance abused, but it is clearly one of the most important services research questions.

Unfortunately, because the situation is not static, it is extremely complex. Drug abuse currently involves substances that range from heroin and other opiates to cocaine, as well as a variety of hallucinogens, stimulants and depressants. New forms of these substances (e.g., crack and other derivatives of cocaine) appear regularly, and new substances (e.g., phencyclidine, or PCP, and "ice") have been developed and widely used within recent years. The difficulty of treating drug abuse increases with the addictive impact of these drugs, the frequency of their use, and the number of substances that are being abused. Polydrug abuse, including the mixing of heroin and cocaine, will likely be more difficult to treat and will require more intensive services than treatment of abuse of a single substance. There is, however, little research with which to assess this issue (cf. Anglin and Hser 1990).

Individual Characteristics

In addition to the nature of the substances abused, treatment is also likely to be affected by the characteristics of the abuser. Based on past research, principally with alcohol abuse and dependency, a profile can be developed of drug abusers who are likely to succeed in treatment (see, e.g., McLellan et al. 1983b; U.S. DHHS 1987b).

Research on treatment for alcoholics has shown that several characteristics--such as marriage or cohabitation, steady work history, higher status occupation, higher social class, fewer arrests, type of occupation, and history of AA contact prior to treatment--are frequently related to positive outcomes (U.S. DHHS 1987b; Solomon 1981). Similarly, research on drug abusers indicates that having more education, better personality

integration, and less dogmatism, along with obvious variables such as fewer aggressive incidents and previous drug arrests (Goodkin and Wilson 1982), are correlated with more favorable treatment outcomes. Although one would not want to use such characteristics to ration treatment, identifying them may be important in making the best use of limited treatment resources.

One specific individual characteristic is gender. As Reed (1981) indicated almost a decade ago, men and women live in "fundamentally different cultures," and that has substantial implications for the nature of their drug problems and treatment needs. Recent evidence (see Griffin et al. 1989) on patterns of cocaine use reflects this idea. Griffin et al.'s research indicates that male and female cocaine abusers exhibit different patterns and reasons for their drug abuse. Men are more likely than women not only to be employed and self-supporting but also to use cocaine as part of a larger pattern of antisocial behavior. Women more often cite specific reasons for their drug abuse and show more depressive symptoms. According to Griffin et al., women's depressive symptoms improve more slowly than men's when the patients become drug free.

Other research (cited in Anglin and Hser 1990) on the higher treatment dropout rates among women has popularized the idea that women experience less social, legal, and financial pressure to overcome their addiction and are less motivated to remain in treatment. Perhaps, however, this high rate of attrition can be explained by the insufficient ability of treatment programs to meet the needs of women.

Similarly, it seems important to consider the ethnicity of the drug abuser (cf. Harper 1980). Research indicates, for example, that Chicanos in treatment for drug abuse are least likely to be employed and most likely to be receiving welfare or disability (Anglin and Hser 1990, p. 43). Their narcotic use is most frequently supported by others, their criminal involvement is high, and their outcomes are the least favorable.

There are also interactions between ethnicity and gender. For example, according to Anglin et al. (cited in Anglin and Hser 1990), Chicana women are more likely to become addicted after becoming involved with and living with a partner who uses drugs than after initiating their own drug use and finding a partner who uses drugs as well. Like issues of gender, this analysis suggests that treatment programs need to be culturally sensitive and tailored to the needs of particular groups.

Although it is often assumed that there are important ethnic differences in the effectiveness of treatment, there is little systematic research to support this idea. A number of studies (see Anglin and Hser 1990) have compared black and white substance abusers in terms of their time of admission to treatment; retention in treatment; and improvements in social, behavioral, and economic variables, yet no consistent pattern of behavior has been identified for either group. These studies, however, have looked at groups in many different forms of treatment programs. It may be important to compare patients from different ethnic groups for each specific type of treatment and to take cultural identity into consideration when a treatment plan is developed for a particular patient.

An additional individual characteristic is the age of the substance abuser. Older patients are found to remain in treatment longer and to have less criminal activity, decreased readmission, and greater composite success. On the other hand, patients under 25, according to most studies (Anglin and Hser 1990), are significantly more likely to leave treatment prematurely than older patients. Furthermore, older addicts with the longest criminal histories were found to be most amenable to the structured lifestyle of a TC; they had experienced the painful existence of jail and did not want to do so any more. Drug patterns are likely associated with age-related developmental patterns, which probably need to be considered in selecting appropriate treatment.

Psychiatric History

A somewhat different type of characteristic of those who receive drug abuse treatment is their psychiatric history. Comorbid psychiatric conditions affect both treatment outcome and the types of treatment that can be employed. There is also evidence (see Bry 1983) that psychological distress can function, along with other risk factors, to predict drug abuse and, perhaps, resistance to treatment.

In terms of treatment success for individuals with psychiatric histories, McLellan et al. (1983*a,b*) found major differences in treatment outcome among patients with overall low "psychiatric severity," midrange psychiatric severity, and high psychiatric severity. Low-severity patients improved in every type of program, and high-severity patients improved in virtually none of the programs; however, those with midrange psychiatric severity showed a wide variation in response to different types of treatment. The match between the specific program and the specific patient proved to be highly influential over the treatment outcome.

Psychiatric history, however, may not predict other aspects of treatment. Kofoed et al. (1986), for example, found no significant relationship between severity of psychiatric illness and retention in treatment for substance abuse. These researchers did, however, find a significant relationship between duration of current treatment and consistency of past outpatient treatment. Presumably, those who had become accustomed to taking an active role in their psychiatric health were more amenable to treatment.

Health Providers

Although little systematic literature exists that discusses treatment differences according to the type of provider who treats those with substance abuse problems, there are important financial differences among the various professionals and nonprofessionals who perform this service. The

treatment system includes physicians (those trained in both psychiatry and other medical specialties) as well as psychologists, social workers, psychiatric nurses, and counselors from a number of backgrounds. In addition, former addicts and others who may not have received formal postgraduate training in health care provide various services in a number of treatment settings. More systematic attention must be paid to the characteristics of providers and to their relationship to the effectiveness and cost-effectiveness of services.

Treatment Duration

A final element of the proposed taxonomy is treatment duration. Time is an important characteristic of treatment modalities; treatment needs change as the individual substance abuser moves from physical and psychological withdrawal, through adjustment to a drug-free state, to some type of stable condition. Three general phases of treatment may be identified: detoxification, rehabilitation, and aftercare. Treatment models can be expected to change as a patient moves through each stage of treatment. In particular, for individuals who receive intensive treatment in a residential setting, the critical issue will be the nature of the aftercare treatment.

POLICY ISSUES AND RESEARCH QUESTIONS

The multidimensional taxonomy described above does not, in itself, answer questions about which treatments are effective for particular substance abusers or about how to finance treatment services. It should, however, make clear the complexity of providing treatment for substance abuse. It is intended to provide a useful conceptual scheme that will enable treatment components to be identified and an evaluable system of treatment to be developed.

There is considerable agreement that drug treatment is effective or, at least, there is support for rejecting the null hypothesis that treatment makes no difference (see Saxe et al. 1985). But there is also considerable skepticism about many treatments, and there is substantial variation in treatment effectiveness. This variation occurs both across and within programs for different individuals served. One explanation for this puzzling, and difficult to use, circumstance is that we often compare "apples and oranges"--for example, similar treatment models with dissimilar patients.

The exigencies of the current national drug abuse crisis (see White House 1989) suggest that we need to develop additional treatment opportunities quickly, and we need to ensure that drug treatment is as efficient as possible. To do so, we need to focus on two aspects of the taxonomy: treatment models as distinct from treatment settings, and the role of abuser characteristics in treatment.

With respect to treatment models and settings, if the amount of treatment provided is to be increased substantially, we are going to need to develop ways of providing treatment in low-cost settings. Although one approach would be to emphasize (through reimbursement or other mechanisms) existing outpatient treatments, there is no evidence that these can be simply substituted for other forms of treatment. Although extant evaluative data do not indicate differential effectiveness for traditional inpatient versus outpatient settings (see Cross et al. 1988), such findings are not equivalent to substitutability. Instead, we need to identify the treatment models that are effective within each type of setting and to experiment with their provision in alternative settings (see, e.g., Craig 1985).

Equally important in dealing with the Nation's drug abuse problems is to understand better the role of abuser characteristics in relation to both treatment models and settings. Different abused substances may, for example, call for wholly different applications of particular treatment models. The same may hold true for treatment

settings. Interactions between drugs and treatment modalities, particularly with substances such as crack and PCP, need to be considered. We urgently need to understand whether existing approaches to drug treatment are relevant to these problems and the extent to which new modalities must be developed. There are some suggestions that because of the neurological and physical effects of these newer substances, current treatment strategies will have to be altered substantially.

Although the present taxonomy emphasizes separating the dimensions of treatment modalities, such identification is only an interim step. The ultimate goal is to develop a cost-effective and cost-beneficial treatment system. To do so, we will have to develop models of the treatment system that are developmental. These models would identify the progression of treatment from early stages of identification through maintenance of abstinence or reduced abuse.

As a society, we have been successful in reducing the levels of use of many substances--primarily, alcohol and tobacco. In both cases, the effort required sustained interest and investments and the application of a host of strategies--educational, psychotherapeutic, and legal. Drug abuse, although less prevalent than the abuse of alcohol or tobacco, is more pernicious and difficult to treat. Our treatment system will need to be as complex as the problem it is intended to address.

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PUBLIC POLICY IN A FRAGMENTED SERVICE SYSTEM

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There is growing public concern over problems of drug abuse in the United States. In public opinion polls conducted in 1981, the public ranked drug abuse as the 10th most important problem facing the country; 16 percent of those responding considered it the most important issue. By 1987, it was ranked first overall, viewed as the most important problem by more than half of all Americans. This increased salience represents, in part, fears about crime and public safety and, in part, concern about the health effects and costs of drug abuse. But whatever the source of public concern, virtually all agree that it is an important goal of Government to ensure that drug treatment is readily available to those who need it. There is, however, considerable disagreement over the amount and kinds of treatment required to meet this goal.

Despite greater spending on drug treatment in recent years, inadequate treatment capacity still appears to limit efforts to deal with problems of alcohol and drug abuse (White House 1989). Although it remains unclear exactly how many drug users would or should seek treatment if it were readily available, recent reports estimate that current capacity would have to be significantly increased to treat all those with "serious" drug problems (Committee on the Judiciary 1990; Malcolm 1989). These reports also raise serious questions about the equity and accessibility of current treatment arrangements. Significant regional variations exist in treatment capacity and waiting time for potential clients (National Institute on Drug Abuse (NIDA) 1989b). Those seeking treatment in some cities wait as long as 8 months before they can enter a program (Marriot 1990;

Wooton 1990). Even with programs operating out of several thousand sites nationally, many communities remain without a local treatment program. Geographic access to care may thus be limited, particularly in rural areas. Government operated or financed sites have especially limited capacity in some States, making treatment of drug abuse accessible only to those with the private means or private insurance to pay for care.

Reports of long waits and inadequate access are troubling, given the high priority that both Government and private employers have placed on reducing drug use. Our ability to assess the extent of these problems and to design remedial strategies has been severely hampered by gaps in our understanding of how the drug treatment system does or should function. These gaps are partly due to lack of information. Although data are periodically collected on the treatment system, we will show here that these surveys omit some types of service providers and some types of information useful for understanding how accessible those services are. At least equally important, policymakers have failed to consider some basic questions that need to be addressed to determine when a system is providing adequate access. These questions include the following:

- What are appropriate standards for adequate access to treatment of alcohol and drug abuse? To what modes of treatment should drug users have access? What sort of choices should they have among different modes?
- Is it important to define explicit service areas or target populations for treatment programs, and if so, how might these differ for various drug problems? How are local and regional variations in capacity related to variations in need or demand for treatment?

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- How, and to what extent, should the various components of treatment capacity be integrated to form a more organized system?

The failure of policymakers to address these questions is perhaps understandable. Historically, these matters have been left equally vague for a host of health and social services. But there is growing acceptance that Government has an important role in establishing standards of adequacy for access to treatment and health services. Congress recently authorized the creation of a new agency for health policy research within the Department of Health and Human Services that was charged with this task. If standards for health services in general are needed, despite the strong professional role of physicians and the growing sense of consumer empowerment for patients, there is inarguably a greater need for standards in the treatment of drug abuse, where professional norms of treatment are ill defined or inconsistent and clients' decisionmaking is potentially too impaired to ensure appropriate utilization.

To help guide the development of the drug treatment system, policymakers must define more carefully what is expected of that system. Yet over the past three decades, the treatment system has evolved with little direction. As a result, it embodies a growing array of different models of treatment, each implicitly defining a different standard of adequacy and accessibility. This has produced a treatment system that is fragmented in both structure and intent. The resulting divisions create separate tracks for publicly and privately financed clients. These divisions also create and reinforce differences between Government and privately operated facilities as well as between facilities specializing in alcohol and drug abuse and those that treat such abuse as part of a broader health care or social service mission.

This heterogeneity makes it difficult to keep track of who is being treated and what form that treatment takes. Gaps and inequities all too easily go unnoticed. The diversity of current arrangements and the rapid pace of ongoing changes also challenge public policymaking, given

that different types of providers will respond in different ways or in varying degrees to particular policy interventions.

The goal of this paper is to explore the issues underlying this complexity. Doing this requires identifying the overlooked questions and missing information that have clouded our vision of the drug treatment system. We must also develop a more comprehensive picture of that system in order to consider how it could be reshaped in the future. Certainly, no single paper can fully address these issues. But we hope to lay out, in a reasonably comprehensive manner, the array of issues that must eventually be addressed to create a more sensible, cost-effective, and consistent policy toward drug treatment in the United States.

The first section of the paper examines the evolution of the treatment system and how history has shaped perceptions of appropriate accessibility and treatment. The second section reviews what is known about current capacity, identifying previously overlooked sites of treatment and dynamics of the treatment system. Our intent is to understand better the full array of treatment providers, to ensure more effective expansion of capacity and preclude expansion that is neither cost-effective nor efficacious. The third section considers the relationship between need and capacity, both at the national level and within more localized treatment systems. The final section pulls together these perspectives and considers drug treatment in the context of broader health and social service systems and the policies that shape them.

THE GOALS OF DRUG TREATMENT AND DEFINITIONS OF ADEQUATE ACCESS

To assess the adequacy of drug treatment capacity, it is essential to establish criteria for judging accessibility. Because conceptions of the appropriate types of treatment have changed so dramatically since the Federal Government first became involved in drug treatment, it is useful to

identify how these changes are linked to alternative definitions of accessibility.

The Changing Nature of Treatment and Public Policies

The treatment of drug problems in the United States has evolved significantly over the past 30 years. As late as 1960, formal treatment was limited to a handful of sites, primarily in prisons. The proliferation of new forms and sites for treatment reflects a variety of changes in thinking about drug treatment since that time (Saxe and Shusterman in this volume). These changes include the development of various self-help group arrangements (typically based on 12-step programs such as that of Alcoholics Anonymous); the perception of alcohol and drug abuse as an illness and of detoxification as a medical treatment; the application of various psychotherapies and behavioral therapies to reduce substance use; and the discovery of pharmacological treatments, most notably the substitution of methadone for heroin.

Each version of the treatment process implicitly defines a standard of accessibility, duration, and content of treatment. Although there is some overlap and combination of treatments, each approach to some extent also defines specific sites for treatment. Early programs were largely for inpatients (although the distinction for a population in prison is admittedly somewhat vague). As notions of treatment changed, outpatient care, therapeutic communities, and other long-term residential programs became more common. Most recently, as private insurance pays for an increasing portion of drug treatment, there has been a resurgence of short-term inpatient care in hospital settings.

The proliferation of programs and treatment philosophies over the past 30 years accompanied public perceptions and political proclamations of three distinct drug crises in American society. The first occurred in the early 1960s, the second in the early 1970s, and the third in the latter half of the 1980s. These crises led, at least temporarily, to

increased spending on drug treatment, and this encouraged significant, albeit somewhat uneven, growth in aggregate capacity.

Prevailing definitions of appropriate treatment and adequate capacity shifted with each new crisis. In the early 1960s, drug abuse was still seen largely in a criminal justice model, with an emphasis on States' establishing civil commitment to motivate treatment (Besteman, In Press). The prevailing conceptualizations of the emerging national treatment system were equally structured and controlling, involving primary treatment in a limited number of inpatient facilities: a dozen centers for the entire country, operated by the Federal Government through the Public Health Service. Aftercare was to be provided by a larger network of community-based agencies to which clients were assigned following inpatient treatment.

By the early 1970s, although the link between drugs and crime was still paramount in national policymaking, preferred models for treatment had changed. Federal guidelines emphasized primary treatment in outpatient programs in each community; this was intended to make treatment more efficacious and cost-effective. It led to an expanded network of Government contracting for these services from private agencies. It was only during the most recent "war on drugs" that private financing became important, with coverage for alcohol and drug abuse treatment increasingly under employer-based health insurance. By 1987, 98 percent of all firms with insurance provided this coverage, which paid for 27 percent of all drug treatment (Schiedemandel 1989; NIDA 1989b). This shift in financing was furthered by Federal policies encouraging drug free workplaces and by regulations in some States requiring private insurance to cover alcohol and drug abuse treatment. Incorporating drug treatment into health insurance encouraged another redefinition of appropriate treatment, this time favoring a more medicalized model that called for episodic care and hospital-based treatments. Between 1980 and 1986, for example, the number of general hospitals with chemical dependency units more than doubled, as

did admission rates for these treatments (Gfroerer et al. 1988).

Over the past three decades, the models for drug treatment encouraged by public policy thus shifted from a criminal justice model emphasizing institutionalization, to a community-based model involving outpatient services, to a medical model favoring institutionalization in somewhat different settings. But each new conceptualization did not fully supplant its predecessor. The result has been a growing complexity and ambiguity (Besteman, In Press). As late as the mid-1970s, the drug treatment system in the United States was a relatively simple one. Treatment was funded largely through Federal dollars, with programs standardized under Federal guidelines (Jaffe 1978). In contrast, contemporary treatment capacity is an amalgamation of different models. Current Government policies offer little guidance to either clients or providers. Private practices emerging under various insurance and managed care plans implicitly embody a set of different and often inconsistent notions of appropriate treatment and accessibility.

Existing arrangements for treating drug problems are sufficiently fragmented, disorganized, and mutually contradictory for some observers to object to any reference to a "system" of treatment. But if there is no drug treatment system in the sense of a coherent and organized array of treatment sites, different programs and payment systems do indeed interact with one another, competing for resources and embodying competing notions of appropriate treatment. They form a system in this broader, more ecological sense, and it is in this sense that we refer to the "drug treatment system" in this paper.

Each different subsystem for drug treatment that has emerged over the past several decades embodies different definitions for accessibility and adequate treatment capacity. Exploring these distinctions is an important step toward establishing common standards that could be used to guide public policies.

The Accessibility of Drug Treatment

Contemporary policy statements have established the standards that drug treatment be available in a timely fashion, that it be appropriate to eliminate or moderate use, and that it help restore social function (White House 1989). But these seemingly simple criteria mask a number of unresolved issues. How much choice should individuals have among alternative treatments? How long should a client be considered "in treatment"? Or, in other words, is drug abuse an acute or chronic condition? Should alcohol and drug abuse be viewed as a condition that requires distinct treatment, or should it be set within the context of other health or social needs of the drug user? Should "treatment" be defined in terms of individuals at all, or should it be defined more broadly to include the users' family, social network, or the neighborhood in which they live?

Each of these questions would have been answered somewhat differently by policymakers at different points over the past three decades. Nor is any consensus on these issues emerging today. Because different segments of the contemporary treatment system retain the imprint of their historical origins, current practices and policies deal inconsistently with these questions. But their answers are critical for assessing adequate treatment capacity. They also hold broader implications, implicitly defining how alcohol and drug abuse treatment fits into the broader context of health and social policies. We explore the first set of issues in this section and return to the second later in the paper.

Alternative Modes of Treatment, Assignment, and Individual Choice

The drug treatment system currently comprises diverse modes and sites for care, ranging from medical to spiritual, individual to large group, outpatient to short-term inpatient to long-term residential communities. Systematic assignments based on appropriateness of treatment are rarely, if ever, attempted. There is instead de facto assignment in terms of ability to pay. Most drug

users whose treatment is publicly funded receive outpatient services, whereas private dollars go mostly to inpatient and residential care. (This, it should be noted, does not indicate any proven greater efficacy of inpatient care for all types of drug abuse, but simply reflects that inpatient services are more readily covered under private insurance.)

More appropriate matching of clients to treatment models could improve the efficacy of treatment. In the words of the 1989 *National Drug Control Strategy* report,

Research shows that, when no effort is made to match the treatment strategy to the user's particular psychological and drug dependency problems, only about one in five drug users benefits. But when users are matched to specific treatments, results improve dramatically (White House 1989, p. 40).

Although experts in drug treatment agree that patients who have been longer or more intensely addicted may require different interventions, most believe that too little is currently known to assign individuals to a single form of treatment. Under these circumstances, allowing clients to select a preferred program may be the most efficacious means of matching.

This may initially appear to be a peculiar concept. Many Americans view drug use as convincing evidence that the user's judgment is seriously impaired. Policymakers are currently questioning the role of client choice. "It is time to reexamine the premise that voluntary drug treatment should continue to be the mainstay of our treatment system. . . . Clearly, relying on the addict alone to initiate treatment is insufficient. When treatment is voluntary, the addict is in the driver's seat" (White House 1989, p. 41). It is important, however, to distinguish between decisions related to the initiation of treatment and those tied to its content, a distinction that is often overlooked. Although addiction may render individuals less able to choose to give up drug use, it need not leave them

unable to choose the treatment with which they feel most comfortable. Evidence suggests that the motivation of the drug user may be an important factor in determining the effectiveness of treatment (Saxe and Shusterman in this volume; Harackiewicz et al. 1987). Allowing the client to choose from among a set of programs--even if requiring that there be some treatment--may thus lead to more effective interventions. Matching based solely on a client's clinical needs may be neither necessary nor sufficient.

Any form of matching has implications for adequate capacity. To make available "treatment on demand," the system must carry a certain amount of excess capacity so that, if new clients seek treatment, they need not wait until others have completed their programs. A treatment system that matches clients to particular treatments must maintain excess capacity: not only must there be treatment slots available, but these slots must be available in all the modes of treatment to which a client might be assigned. Moreover, every community must have access to a full array of treatment options. If client choice is also considered important, excess capacity must be expanded yet again to allow clients to select from among several programs. To make choice possible, public policies need to encourage the creation of additional treatment programs, perhaps favoring small programs over broader regional treatment centers.

Appropriate Duration of Treatment

Some interventions implicitly or explicitly define drug treatment as short term, the analog to acute medical care. Others view it as a chronic condition, in some models requiring a commitment to some form of lifelong treatment. Current policies and practices are particularly inconsistent in this dimension. The *National Drug Control Strategy* refers to drug use as being "like other chronic diseases." It accordingly favors longer term forms of treatment. "Research suggests that the less severe an individual's drug problem, and the longer he remains in treatment, the more likely

it is that drug dependency can be reduced or ended altogether" (White House 1989, p. 36).

However, this assessment is largely based on faulty interpretation of past research. It is certainly true that those who remain longer in treatment are more likely to stay off drugs later. But that says less about the effectiveness of long-duration treatment than it does about the fact that those most likely to return to drug use drop out of long-duration programs. Those that remain have long-term success rates of up to 50 percent, but this is a strongly self-selected group. There is, in fact, relatively little evidence from well-designed, controlled trials of the link between treatment duration and effectiveness. The evidence that does exist suggests that appropriate duration likely depends on both the nature of the drug dependency and certain individual characteristics (Saxe and Shusterman in this volume; Apsler and Harding in this volume).

At the same time that national policy is invoking the concepts of chronic disease and long-term treatment, there is little evidence that this policy is being translated into practice. Relatively few programs, whether publicly or privately funded, have the capacity for long-term followup and maintenance to deal effectively with drug abuse as a chronic condition. Little is known about the average duration of treatment in most programs, but on the basis of the total system capacity and the number of clients treated over the course of a year, one can estimate that the average client remains in treatment somewhere between 3 and 4 months. Private insurance is much more likely to pay for relatively short-term programs involving hospitalization than for other types of treatment. Our analysis of data from the National Drug Abuse Treatment Unit Survey (NDATUS) shows, for example, that 44 percent of all hospital-based care for drug abuse is paid by insurance, compared with less than 20 percent at other sites. The growth of insurance-based financing has thus moved the treatment system away from a long-term care perspective.

There is an obvious link between treatment duration and needed system capacity. All else equal, the longer the desired duration of treatment, the greater the required capacity (Apsler and Harding in this volume; Fisher and Phillips 1990). This may be offset somewhat by differences in treatment effectiveness. There is some evidence to suggest that if short-term treatments are less effective, they will repeatedly recycle the same clients. For example, as the Veterans Administration (VA) has reduced the length of stay for its patients treated for alcohol and drug abuse and mental illness, the 14- and 90-day readmission rates have both risen markedly (Rosenheck et al. 1990). But even accounting for some differences in efficacy, longer duration treatment would undoubtedly require greater aggregate capacity. A treatment system that embodied the notion of lifelong treatment, for example, would require perhaps a doubling or tripling of current outpatient capacity to ensure ongoing treatment.

Similarly, pursuing a philosophy of long-term treatment could significantly alter the financing of the treatment system. As noted above, private health insurance pays disproportionately for short-term treatment. If treatment were required to be longer, it would fall outside the bounds of much private insurance, which typically contains explicit exclusions on the coverage of chronic mental disorders (the category into which alcohol and drug abuse is usually placed) (Schlesinger 1986). Private insurance to pay for long-term care has only recently become available in most communities, and few employers have exhibited great willingness to offer such coverage as an employee benefit (Shearer 1989).

Integration and Specialization of Providers

Current capacity has become segregated into two separate subsystems of care: one primarily for the privately insured, and the other for those whose treatment is purchased by governments. Average spending per client is significantly higher in the former subsystem than in the latter.

Such distinctions may or may not reflect important differences in accessibility. If the privately insured who are treated in inpatient settings are not necessarily receiving better care, separate patterns of treatment may simply reflect the orientation of private insurance to hospital care and suggest nothing about either the equity of the overall system or its relative effectiveness for individual clients.

Whether or not one considers separate drug treatment systems as being inherently inequitable, such systems do raise concerns about ensuring adequate-quality services. The treatment of privately insured clients is increasingly being monitored by their insurance plan or other third parties. Inadequate treatment, clients dropping out of programs, or other failures are likely to be observed through insurers' utilization review or employers' employee assistance programs (EAPs) (Tompkins in this volume; Masi 1989). This serves as a check on the overall quality at the treatment site. When publicly and privately financed clients are treated apart from one another, the former cannot benefit from this sort of oversight.

For similar reasons, there has long been a presumption that recipients of Government-purchased health services should receive care in the same settings as the privately insured. For many years, the legislation enabling Medicaid and Medicare contained "freedom of choice" provisions that required the Government to allow recipients to choose their own service providers. Although this requirement was eliminated for Medicaid in 1981, providers who contract to serve Medicaid beneficiaries in restricted choice systems are also generally required to serve a minimum percentage of privately insured patients. This is to ensure that the providers maintain adequate quality.

Similar concerns exist for drug treatment, yet no comparable policies exist to ensure that publicly funded clients are "mainstreamed" into the same providers that serve the privately insured. Under the relatively homogeneous treatment system developed during the 1960s, this was not an

important issue. As treatment programs proliferated in the early 1970s, separate tracks of care became more distinct. It was not until the 1980s, however, that private insurance for alcohol and drug abuse created more systematic separation between insured and uninsured clients.

Were policymakers to respond to these changing practices, there could be important implications for system capacity. Currently, facilities that serve publicly financed patients have little capacity for additional treatment, whereas those that specialize in private-pay patients often operate at 50 or 60 percent of capacity. Requiring greater mixing of clients--whether by regulating providers or by setting reimbursement rates high enough so that publicly financed clients appear more profitable to treat--could tap into this unused capacity. In the absence of such changes, the capacity of the "public" treatment system would require substantial expansion.

Related questions involve particular subgroups of drug treatment clients. Congress recently mandated explicit expansion of capacity to treat "special populations," including women and racial and ethnic minorities. It left unspecified whether this was to occur within existing programs or in separate sites. Should programs be allowed or encouraged to specialize in treating clients from particular sociodemographic groups? Would specialization promote access for the special populations or channel them away from better quality treatment in mainstream treatment facilities? Would policies favoring separate treatment indirectly produce a separate-and-unequal drug treatment system segregated by sex, race, or ethnicity?

Focus of Treatment: The Condition, the Individual, or the Community?

Virtually all policy discussions of treatment capacity focus primarily on the drug use itself. Thus, while many modes of treatment emphasize the need to treat the "whole person," including that individual's psychological and spiritual needs (Saxe

and Shusterman in this volume), these concerns are rarely reflected in policymakers' considerations of adequate treatment capacity. Studies that highlight the interaction of drug use and mental illness suggest the need to consider these broader health needs (McLellan et al. 1983). But these needs are not limited to mental health; drug users also may have significant physical health problems. More than a half-million Americans are admitted each year to community hospitals with a primary diagnosis of physical illness and a secondary diagnosis reflecting drug problems (Rice and Kelman 1989). More than 50,000 of these admissions reflect drug dependency involving opiates or cocaine (Gfroerer et al. 1988).

Although it is possible to structure programs at any site so that they provide both mental and physical health care, in practice those sites that are directly affiliated with a mental or general health care agency are almost certainly more likely to make these services accessible. As we discuss below, drug treatment in mainstream health facilities plays an important, and heretofore largely unnoticed, role in addressing drug problems. To the extent that the problems of drug users extend beyond the drug use itself, this aspect of system capacity may prove most appropriate.

Problems of drug use also go beyond the individual. Virtually all assessments of drug problems in the United States recognize the link between an individual's drug use and that individual's family life, social network, and community. Yet relatively few modes of treatment emphasize this link in an active or concrete sense; and, in policy discussions, treatment capacity is virtually never defined in these broader terms. This is reflected in several aspects of current policies and practices.

There are few current requirements for providers to offer services to families of drug users, and too often the link between individual and family remains unaddressed. According to statistics collected by NIDA, roughly 80 percent of the programs providing drug treatment serve some "collaterals," the term used for family and friends

(NIDA 1989b). But although there is growing recognition of issues of "codependency," services to collaterals are often in name only. In those programs that offer drug treatment exclusively, there were more than 144,000 drug users in treatment on October 31, 1987, yet only 24,000 collaterals were being served. Assuming that in some cases there were more than one collateral per client (as with parents of an adolescent using drugs), as few as 10 percent of those treated for drug use may have services directed to their families, partners, or other sources of social support. (Clearly, other social service programs serve family and friends, but there are few assurances that these people will receive services unless those services are offered under the rubric of a common program.)

There are also broader questions involving the relationship of drug treatment to the community. At the most basic level, policymakers rarely, if ever, assess treatment capacity at the community level though there is considerable local variation in capacity. Indeed, as we describe later in this paper, there are insufficient data even to begin to determine whether capacity is adequate in most communities. In part, this is because there have been no efforts to identify the geographic areas from which programs draw clients, so that capacity cannot be assessed in local terms. And in part, this is also because there are currently no reliable measures of need for treatment at the local level, and hence there is no way of relating capacity to need.

Community conditions can be related in several ways to adequate capacity. The challenges of treating drug use are likely to be particularly pronounced in communities that have high concentrations of drug users. The greater availability of drugs, the erosion of social norms discouraging drug use, and the development of an active illicit drug trade all may make it more difficult for any individual to stay off drugs in these areas than in communities where drug use is less prevalent. Similarly, it has been argued that poverty may have pernicious social effects, making it most difficult for individuals to climb out of

poverty in those neighborhoods where it is highly concentrated (Wilson 1987). Such "concentration effects" argue for allocating disproportionate treatment capacity to the communities in which drug use is most prevalent.

There has been some recent recognition of this issue: a Senate report called for designating some communities as "drug emergency areas" and channeling "more than the normal amounts of Federal aid" to these areas (Committee on the Judiciary 1990, p. 23). But this approach is not reflected in existing policies. Many States continue to allocate State and Federal treatment funds in proportion to population. Even most sophisticated formulas adjust only somewhat for prevalence rates of drug use among communities (Newcomer and Stoddard 1986). This approach is inadequate to reflect the potentially exponential consequences of concentration effects.¹

The link between drug use and the community also suggests that treatment itself be considered in community terms and that services be developed that "treat" the community in ways comparable to treating individuals. Instead, many treatment programs are oriented toward removing individuals from the community (isolating them from its influence and, in some cases, creating an alternative therapeutic community). Although other Government programs deal with some community needs, they function independently from, and with little understanding of, drug treatment issues.

Finally, for many of the same reasons that client choice may be an important part of efficacious treatment, so too may community control be important for developing the treatment system. In a number of communities, capacity has been limited by an unwillingness of residents to accept new treatment sites (Gustafson, personal communication, 1990; Marriot 1990). Resistance to new programs reflects, in part, the perception of residents that the programs are being imposed by external agencies. Although most organizations providing drug treatment are typically referred to as "community agencies," there are few guidelines

and fewer requirements for ensuring that there is actually any community control over their operation.

Community-oriented drug treatment programs, although rare today, were more common historically. Programs developed by the Office of Economic Opportunity placed considerable emphasis on both community orientation and control. When these were merged in the early 1970s with programs under the auspices of the National Institute of Mental Health (NIMH), however, community control was replaced by the authority of health care professionals (Besteman, In Press). The vestiges of community orientation were further diffused as treatment shifted into medical facilities, reinforcing the role of health professionals. The one possible exception to this trend involved federally designated community mental health centers (CMHCs), which were required by the Federal Government to establish programs for alcohol and drug abuse beginning in 1975 (Foley and Sharfstein 1983). CMHCs were also required to meet certain standards of community participation in governance (Dorwart and Meyers 1981). Most of these agencies continue to have defined catchment areas and assigned responsibilities for the mental health care needs of the communities in which they are located. Little is known, however, about whether these programs truly are more focused on the community than are programs in other agencies.

The Balance Among Different Dimensions and Conceptions of Treatment

Defining "appropriate capacity" thus depends fundamentally on how one thinks about treatment, the role of individual and community choice, and the relationship between drug use and the other needs of individuals or the communities in which they live. The implicit standards that are reflected in treatment practices have changed as the treatment system has evolved over time. There is, however, little evidence that current practices are converging toward some agreed-upon norm. If anything, the growing fragmentation of the

treatment system reflects a disintegration of norms that were more widely held in the past. Without some sense of how one should address the issues that have been raised here, it is difficult to try to judge the adequacy of existing capacity. Under these circumstances, it is not surprising that observers believe there to be little accord among policymakers on direction for policy--so little, in fact, that policymakers have been described as "flying blind" (Malcolm 1989; Marshall 1988).

Clarifying some of the issues, such as the relationship between treatment duration and outcome, will require further research. But even with our limited current knowledge, "accessibility" of drug treatment could be better defined in several ways. First, there is clearly a need to improve the matching of treatment models to clients, whether through a case manager or through some form of client choice. This requires maintaining additional capacity within the system and ensuring that a full array of treatment models is available in each community. Second, in the absence of an extensive set of regulations and mechanisms to control the quality of treatment, there is a strong rationale for establishing policies that better intermix clients paid through public and private programs, so that the latter can act to safeguard quality for the former. This may require "open enrollment" rules for treatment programs to avoid having programs screen out particular clients. Third, as it is likely that drug problems are more intense, and lasting treatment more difficult, in areas where drug use is highly concentrated, there should be a broader and richer array of services--that is, a greater capacity relative to the number of individuals in need in those communities.

These conclusions only begin to clarify the complex issues associated with defining adequate capacity. In the past, however, policymakers' attention has been drawn more to counts of facilities and lengths of waiting lists than to definitional issues. This is not surprising, given that the former seem more concrete, more evidential that something is being done about the drug problem. Ironically, however, as we show in

the next section of this paper, the data from which these measures are constructed are so incomplete that they may do more to obscure than to illuminate the state of the current treatment system, let alone offer guidance as to how that system should be changed.

MEASURES OF CURRENT TREATMENT CAPACITY

Like "accessibility," "capacity" can have a number of different meanings. These include (1) the number of clients currently in treatment, (2) the extent to which additional clients could be treated in the short term, and (3) the ease with which the system can be expanded over the longer term. Current levels of treatment are essentially static measures; the other two are dynamic, representing the system's capacity to change in response to changing conditions.

The first definition is seemingly the most straightforward, involving simply a count of those clients currently being treated for drug abuse. Yet even at this level, ambiguity is difficult to avoid. There is a sufficient variety of treatment models so that proponents of some approaches would argue that other approaches should not be counted as treatment at all. Are those persons in self-help groups being "treated"? Are patients admitted to a community hospital with a number of diagnoses, including one of alcohol and drug abuse, being treated for their drug use? Because virtually no data are collected on an ongoing basis about the content of treatment in any setting, it is hard to formulate reasonable standards for what constitutes treatment. Consequently, for the rest of this paper, we will assume that clients are being treated for alcohol and drug abuse if they receive services from an agency that has such treatment as its sole purpose or that reports that the patient's primary condition ("diagnosis" in medical facilities) involves alcohol and drug abuse.

Measuring the capacity for short-term expansion involves other conceptual issues, chiefly the

determination of what constitutes the "short term." When NIDA collects data on the treatment system, it defines "capacity" in this sense, which it describes as "the maximum number of individuals who could be enrolled as active clients . . . given the unit's staffing, funding, and physical facility at that time" (NDATUS). This definition is least ambiguous for inpatient facilities that are funded through a lump-sum budget. Such facilities have a fixed array of resources, which, given the standard of care provided to each client, largely determines the number of clients who can be treated.

Relatively few treatment facilities actually operate in this manner, however. Most treatment in inpatient settings is funded on a fee-for-service basis. Capacity is not determined by financial resources; the more patients treated, the more the facility is paid. In this case, the constraint is primarily in terms of the number of available beds. Here too, however, there may be considerable flexibility. Most inpatient care is provided in facilities that treat drug abuse in addition to other mental or physical illnesses. Even in facilities that specialize in alcohol and drug abuse, 60 percent of the clients treated for drug abuse are in centers that also treat alcohol abuse. Effective capacity could thus be expanded in the short term by treating drug users in beds previously devoted to other conditions.

Most of the drug treatment in the United States is through outpatient programs. Their primary constraint on expansion involves staffing. This may be relatively flexible if new staff can be added or existing staff encouraged to work longer hours. The potential for this flexibility is thus affected by the labor market for drug counselors and, indirectly, by broader labor market conditions in the community.

The third definition of capacity involves the potential for expansion over the longer term. The key question is this: To what extent, and how quickly, could the treatment system respond to changes in the need or demand for treatment? This response involves not just existing providers, but also new agencies that might be established or

additional providers that had previously specialized in delivering other sorts of health or social services.

We are able to construct the most accurate measures of capacity as it is defined in the first sense; even here, however, there are some important ambiguities. Although NIDA collects information about capacity in the second sense, the conceptual problems described above make it difficult for most responding agencies to provide data. Very little is known about the longer term dynamics of the treatment system. We review here data on capacity measured in the first two senses and then discuss some of the factors that are likely to affect capacity and the long-term responsiveness of the drug treatment system.

Static Measures of Capacity

The NDATUS is the most up-to-date and widely cited source of data on drug treatment. Funded through NIDA, it is fielded at roughly 3-year intervals, collecting data from both public and private treatment programs for alcohol and drug abuse. It serves as the basis for virtually all past Federal reports on treatment capacity, including the annual drug strategy reports from the White House. Despite this widespread use, however, NDATUS has some very serious liabilities, as it overlooks a substantial portion of treatment for drug use, particularly in inpatient facilities.

The 1987 NDATUS identifies nearly 7,000 facilities providing treatment of drug and/or alcohol abuse in the United States (NIDA 1989b). Just over 1,000 facilities are for drug treatment alone, and 4,000 provide combined treatment of alcohol and drug abuse. A total of 834,000 clients were treated for drug use during 1987 (with 260,151 under treatment on a given day), at a cost of more than \$1.3 billion. Over half the funds came from public or government sources, including block grants and Medicaid, but nearly 40 percent came from private sources, including insurance, client fees, and donations.

The bulk of this capacity was devoted to so-called drug-free interventions. Thirty percent involved methadone maintenance, and just over 5 percent took the form of short-term detoxification. Most of this care was in outpatient settings, although roughly 15 percent of the patients under treatment on a given day were in hospital units and 10 percent were in residential programs. Less than 3 percent of all treatment occurred in correctional institutions.²

Although the measures of treatment provided through NDATUS are the most comprehensive available, they have some important gaps. Facilities are included under NDATUS only if they treat alcohol and drug abuse exclusively or operate a separate unit that specializes in that treatment. Other facilities without specialized units and private practitioners who treat a variety of medical or psychological problems are not included.

In the remainder of this paper, facilities that treat only alcohol and drug abuse will be labeled "exclusively substance abuse (treatment) facilities," or ESAFs. Facilities that treat alcohol and drug abuse as part of a broader mission of providing health services will be referred to as "nonexclusive substance abuse (treatment) facilities," or NESAFs. NESAFs can, in turn, be divided into two groups: facilities that treat alcohol and drug abuse without a distinct program, such as community hospitals treating drug problems in patients admitted to general medical-surgical units; and facilities that provide health services as well but that have a distinct alcohol and drug abuse treatment program. This second group we will refer to as "overlap NESAFs," because they are included in the existing counts of treatment facilities constructed from NDATUS.

To estimate the amount of drug treatment not captured through NDATUS, it is necessary to look to other data sources to calculate the amount of drug abuse treatment provided in NESAFs, and then to subtract out those facilities in the overlap group. There are three types of facilities that provide the bulk of this treatment:

- *Psychiatric hospitals.* Data from the National Association of Private Psychiatric Hospitals' (NAPPH) 1988 annual member survey suggest that approximately 10 percent of their patients were discharged with a primary diagnosis of drug abuse and 8 percent were discharged with a primary diagnosis related to alcohol abuse. Over 13 percent of all bed days were devoted to treatment of drug or alcohol abuse (NAPPH 1989). Roughly 25 percent of all admissions to State and county psychiatric hospitals involved a primary diagnosis of alcohol and drug abuse; about one in five of these involved drug abuse alone (NIMH 1987).
- *Short-term general hospitals.* Significant alcohol and drug abuse treatment is provided in both non-Federal general hospitals and Federal ones, primarily VA facilities. Analyzing data from the National Hospital Discharge Survey 1984-86, Rice and Kelman (1989) report almost a half-million annual discharges from community general hospitals for patients with a primary diagnosis of alcohol and/or drug abuse. Over roughly the same period, VA facilities averaged slightly over 100,000 discharges annually for patients with a primary diagnosis of alcohol and drug abuse (Rosenheck et al. 1990).
- *Community mental health centers.* Annual surveys conducted by the National Council of Community Mental Health Centers (NCCMHC 1985, 1986, 1987) show that almost two-thirds of CMHCs treat alcohol and drug abuse. Over a 3-year period, beginning in 1985 and ending in 1987, an average of 15 percent of clients who were treated (all modalities) at such agencies had a primary diagnosis of alcohol and drug abuse. The percentage of patients with alcohol and drug abuse diagnoses was relatively stable from year to year.

These facilities provide treatment for drug and alcohol abuse on both an inpatient and an outpatient basis. A smaller number of programs

also offer long-term residential services. The relative importance of NESAFs and ESAFs varies significantly by mode of treatment, with NESAFs playing the largest role for inpatient care and the smallest role for residential programs.

Below we have constructed measures of NESAF involvement in each of these areas. These estimates should be viewed with caution because they reflect several important limitations. A number of ongoing provider surveys, including the Inventory of Mental Health Organizations (IMHO) conducted by NIMH, group together drug and alcohol abuse diagnoses on their reporting forms. We have therefore constructed initial measures for all alcohol and drug abuse, and then we have estimated the proportion of that care that is targeted to drug abuse.

The estimates for NESAFs are based on patient diagnoses. Because there is no information on the content of treatment within NESAFs, not all patients with a primary diagnosis of alcohol and drug abuse were necessarily treated for that condition. Conversely, however, a number of patients with secondary diagnoses of alcohol and drug abuse may have received some treatment. For example, more than one-half million general hospital discharges per year involve a secondary diagnosis of drug abuse (Rice and Kelman 1989). This includes 471,000 who had a drug abuse problem, an additional 72,000 who had a dual secondary diagnosis involving drug abuse and mental illness, and 26,000 with a combination alcohol/drug diagnosis. It is thus unclear whether using primary diagnosis as a proxy for treatment undercounts or overcounts the amount of treatment in NESAFs.

Inpatient Treatment of Alcohol and Drug Abuse.

The 1987 NDATUS reported that on a given day, roughly 30,000 patients were being treated for alcohol and drug abuse in inpatient units. (Detailed statistics for inpatient care are presented in the appendix to this paper, table A.1.) About a third

of these patients were in treatment for drug abuse; the rest were being treated for alcohol problems.

The IMHO collects data on treatment in mental health organizations, excluding ESAFs. The 1986 IMHO reported an average daily census of 15,782 inpatients in psychiatric and general hospitals and CMHCs with a primary diagnosis of alcohol or alcohol and drug abuse (table A.1, col. 1). Almost 60 percent of these were in psychiatric specialty hospitals, 30 percent were in the inpatient units of CMHCs, and the rest were in psychiatric units in general hospitals.

To estimate the number of patients treated in scatter beds (beds not assigned to a particular service) in short-term general hospitals, it is necessary to subtract from the aggregate numbers of patients reported above those patients who were treated in specialized units within the hospital. On any given day, the average number of patients with a primary diagnosis of alcohol and drug abuse in non-Federal general hospitals was 19,142 (Rice and Kelman 1989) and in VA hospitals, 6,389 (Rosenheck et al. 1990). Of these, we have calculated from the 1987 NDATUS that 11,517 were patients within separate alcohol and drug abuse units in VA and non-Federal hospitals combined. The findings from the 1986 IMHO indicate that another 2,066 were patients in separate psychiatric units. This leaves an estimated 11,918 patients treated in scatter beds (table A.1, col. 1).

Taken together, on a given day patients with a primary diagnosis of alcohol and drug abuse totaled 39,217 in NESAFs. Estimating the amount of overlap is relatively straightforward. Patients in alcohol and drug abuse units were clearly part of the ESAF; those in psychiatric units and scatter beds were clearly not. A portion of the psychiatric hospitals and CMHCs do report on NDATUS. Fifty-seven percent of the hospitals but only 17 percent of the CMHCs reported their inpatient capacity on NDATUS, suggesting that separate inpatient units for alcohol and drug abuse were far more common in hospital settings.

Adding together these categories, NESAFs reporting on NDATUS treated 17,404 patients for alcohol and drug abuse on an average day (table A.1, col. 2). (This represents 57 percent of all inpatient treatment (30,210) measured through NDATUS.) An additional 21,813 patients were treated in NESAFs that did not report on NDATUS. Forty percent of all inpatient treatment for alcohol and drug abuse has thus been omitted from past counts. The proportion of this treatment that is for drug abuse varies from 19 percent in VA hospitals to 43 percent in the psychiatric units of general hospitals (see the notes to table A.1, col. 3).

Outpatient Treatment of Alcohol and Drug Abuse

NDATUS reported a total of 509,675 outpatients in treatment for drug and alcohol problems on a given day at ESAFs. About 220,000 of these clients were being treated for drug abuse. Again, the IMHO provides the best overall count of patient care in NESAFs (table A.2, col. 1). Data from the IMHO indicate that on a given day in 1986, outpatient clinics (freestanding clinics and multiservice agencies) had 192,970 clients under treatment for a primary alcohol or drug abuse problem. Hospital outpatient departments had another 80,000 clients under their care. Two-thirds were being treated through the outpatient departments of general hospitals; the rest, under the auspices of psychiatric specialty hospitals.

Only general hospitals with a psychiatric unit report on the IMHO. Others might also provide a substantial amount of outpatient care for alcohol and drug abuse. Unfortunately, we have data available only on those additional hospitals that operated a unit for alcohol and drug abuse and thus reported on the NDATUS. We estimate (see notes to table A.2) that these represented roughly an additional 29,000 patients under treatment on any given day. Because these counts omit hospitals that have neither a psychiatric nor an alcohol and drug abuse unit, they must be viewed as a lower-bound estimate of the role NESAFs play in providing outpatient treatment.

Aggregating across these facilities, NESAFs treated a total of 273,344 clients for alcohol and drug abuse on a given day. The overlap between this count and the NDATUS count is significantly larger than that for inpatient care, ranging from 21 percent for psychiatric hospitals to 78 percent for general hospitals (table A.2, col. 2). About a third of the total treatment reported on NDATUS thus takes place in NESAFs. Again, a substantial amount of treatment is not captured through NDATUS. This totals 113,659 patients at psychiatric hospitals, community general hospitals, and mental health clinics. It represents more than a 20-percent addition to capacity. The estimated additional capacity is proportionately as large for drug treatment (table A.2, col. 3) as for alcohol and drug abuse generally.

Outpatient care is also delivered in a broad array of settings. Unfortunately, we know little about outpatient treatment delivered by private practitioners other than psychiatrists. Surveys conducted by the American Psychiatric Association suggest that about 5 percent of psychiatrists' patients--an estimated average daily census of about 90,000--are under treatment with a primary diagnosis of alcohol and drug abuse (Koran 1987). We have no way of determining how much of this care is for drug problems alone or what sort of treatment occurs in these settings.

Although we have no comprehensive surveys to assess treatment of alcohol and drug abuse by other practitioners, data exist that allow us to construct a crude estimate of a portion of this care. Under the auspices of NIMH, the Epidemiology Catchment Area (ECA) study collected information on need and use of services for a full range of alcohol, drug abuse, and mental health disorders. Data collected from five different communities suggest that people received care from general medical practitioners between 25 and 40 percent as often (varying by city) as they did from mental health care specialists (Locke and Regier 1985). This in turn suggests that on any given day, approximately another 30,000 patients are treated nationwide for alcohol and drug abuse by physicians other than psychiatrists.

An unknown but potentially substantial number of clients is treated for alcohol and drug abuse by psychologists or social workers in their private practices. For example, in the 1988 membership survey of the National Association of Social Workers, 3,675 social workers (roughly 3 percent of all members) reported that they specialized in treating alcohol or drug abuse. A 1982 survey by the American Psychological Association of psychologists who labeled themselves "health service providers" found that 23 percent "regularly or often" saw clients with alcohol and drug abuse problems, and 3 percent reported that they "most frequently or exclusively" saw clients with these problems (VandenBos and Stapp 1983). Unfortunately, the surveys did not collect data that would allow estimates of the number of clients actually treated for alcohol and drug abuse.

Finally, various forms of self-help groups can be considered to provide a form of treatment. In part due to their rapid recent growth and in part due to attempts to maintain anonymity for participants, these groups do not provide an accurate count of the current or former drug users who are affiliated with them. Based on telephone interviews with representatives of State and national associations, we estimate that at least 150,000 people at any one time (and possibly many more) currently participate nationwide in these self-help arrangements for problems associated with illicit drugs. This must be considered a very crude estimate, however, because there are no clear guidelines to determine what constitutes such a group or how closely a person must be affiliated to be considered a participant.

Residential Programs for Alcohol and Drug Abuse

Residential and domiciliary programs appear to play a much smaller role among NESAF facilities than either hospital or outpatient treatment. The 1987 NDATUS found that, on a given day, 58,194 people were in residential programs for alcohol and drug abuse. Roughly half of these residents were treated for drug abuse, half for alcohol abuse (table A.3, col. 3). Data from the 1986 IMHO

suggest that, even when one adds together residential programs operated by hospitals, CMHCs, and freestanding programs, only about 4,400 residents have a primary diagnosis of alcohol and drug abuse. We have no way of calculating, from available information, the extent of overlap between these counts. We have therefore estimated this overlap, assuming that it is proportionately the same for each category of facility as it was for outpatient care (table A.2). Under these assumptions, roughly half the NESAF capacity is already measured through NDATUS. The unmeasured component represents only a small increment to aggregate capacity, a total of just under 4 percent. (If the overlap was assumed to be the same as for inpatient care, the unmeasured capacity would grow to 5 percent.)

The Unmeasured Side of Capacity

Overall, it is clear that NESAF providers deliver a substantial portion of the treatment for chemically dependent Americans. This picture is presented in summary form in figures 1 and 2. (Figure 1, which groups together alcohol and drug treatment, provides a more comprehensive and probably more useful picture of capacity, because capacity for alcohol treatment may to some extent be convertible into capacity for drug abuse treatment.) These figures graphically illustrate the extent to which NDATUS--the standard measure of treatment capacity in Government statistics--undercounts overall capacity and includes in its measured capacity a substantial amount of treatment in facilities where treating alcohol and drug abuse is not the primary mission (the "overlap" facilities). NESAFs omitted from NDATUS add about 40 percent to the previous counts of inpatient capacity and about 20 percent to the counts of outpatient capacity. This is particularly important for drug treatment; NESAFs add close to 60 percent to the inpatient treatment capacity for drug abuse. If one were to include patients with secondary diagnoses of drug abuse being treated in scatter beds of general hospitals, or the treatment being administered in the offices

of private practitioners, these numbers would be even higher.

The statistics presented above are national averages. There are significant variations in the role of NESAFs in treating alcohol and drug abuse. For example, analysis of IMHO data indicates large interstate variations in the proportion of patients in psychiatric inpatient and outpatient facilities who are treated under a primary diagnosis of chemical dependency. (Table 1 contains the highest and lowest States in each group.) In the half-dozen States with the most extensive NESAF involvement, the average facility has five to six times as many alcohol and drug abuse patients as does the typical facility in the six States with the lowest NESAF activity. The significant role of NESAFs makes it clear that greater attention must be paid to the type of treatment that patients receive in these settings. It also raises some important questions about the longer term dynamics of a treatment system that is divided between specialty and nonspecialty facilities. We return to these issues below.

Dynamic Measures of Treatment Capacity

Short-Term Capacity

As noted above, NDATAUS collects measures of treatment capacity intended to assess the potential for expanding treatment in the short term. Data from the 1987 NDATAUS indicate that inpatient facilities for drug treatment were operating at only 57 percent capacity, residential programs at 77 percent, and outpatient programs at 81 percent.

These measures presume that reported capacity represents accessibility; that is, if an additional client sought treatment at a facility operating at 50-percent capacity, he or she could be assured of treatment. In practice, this may not be the case. Particular clients may look relatively unattractive to providers, because they are paid for through a program with inadequate rates, because they are costlier than average to treat, because their type of

addiction is one in which the facility does not specialize, or because their presence would discourage patronage by other, more profitable clients. This sort of client screening is becoming increasingly common among health care facilities (Schlesinger et al. 1987a). Because NESAF capacity is within these very facilities, it is not surprising that similar issues have been raised anecdotally in the drug treatment system (Besteman In Press; Tatge 1985).

The important role of NESAF providers highlights other problems with these measures. Definitions of capacity used in NDATAUS become vague in these settings because drug treatment capacity can readily expand or contract, depending on providers' assessment of the relative attractiveness of treating patients with alcohol and drug abuse compared with patients with other mental or physical illnesses. In outpatient settings, measurement problems are compounded further. For office-based practitioners, for example, capacity is defined by patient caseload. But caseload is flexible and, with appropriate incentives, can expand or contract. Problems of defining capacity become even thornier when one considers self-help groups as forms of treatment: little is known about the optimal size of such groups or about their ability to expand rapidly in response to growing demand for drug treatment.

In these settings, the distinction blurs between short-term and long-term responsiveness. As a result, some of the most important dynamics in the drug treatment system may involve factors that shape the long-term evolution of treatment capacity.

Long-Term Capacity: Fragmentation of Ownership and Control

The segmentation of drug treatment capacity into subsystems of particular types of facilities holds some potentially important implications for its long-term evolution. One distinction drawing considerable attention has been between public and private systems of care (Yahr 1988). This

distinction is typically defined in terms of the source of funding and the types of clients who are seeking care. About three-quarters of all drug treatment facilities are paid primarily through public dollars (NIDA 1989b).

A second distinction involves the auspices under which services are provided (Steinberg 1989). Although for-profit ownership of drug treatment facilities has increased rapidly over the past decade, it still represents the least common form of ownership, controlling about 20 percent of treatment capacity. The most common form is private nonprofit ownership, representing roughly 50 percent of drug treatment facilities. The remaining centers are under public ownership, predominantly State and local governments.

These distinctions in ownership and control of the treatment system can shape its dynamics in several ways. First, facility ownership may alter treatment practices within the facility. Past research on health facilities generally suggests that ownership affects the areas in which facilities locate and the clients they choose to serve (Hansmann 1987; Schlesinger et al. 1987b). In addition, for-profit, private nonprofit, and public facilities may treat drug problems differently. (Studies suggest that health care facilities operating under for-profit ownership provide different types of care than that provided to comparable patients in nonprofit or Government-operated facilities (Schlesinger et al. 1989b). Consequently, as the balance among types of organizations changes over time, so does the prevailing nature of treatment. This, in turn, shapes the implicit norms for adequate capacity in ways that have been discussed above.

The changing mix of ownership and control in the drug treatment system may also alter public expectations in ways that have long-term consequences for capacity. The growing private market for drug treatment, for example, may have positive effects on the overall system because it encourages the entry of additional providers and new sources of funding, and because it may reduce the stigma of drug treatment. On the other hand, it may also have serious negative effects on the

public tier of the treatment system. Past experience in mental health care, for example, suggests that as private facilities enter a market, they can "cream off" private-pay patients, leaving public facilities with only the clients who are most difficult and costly to treat (Dorwart and Schlesinger 1988). This process may reduce public support for Government spending for drug treatment by creating the impression that public providers are less efficient because the average cost of care in these settings is higher. Reduced financial support would put further financial pressure on the public tier of the system, leading to either reduced access or less adequate treatment. This, in turn, further stigmatizes the public system and reduces support for its funding, creating a downward spiral in the funding for and quality of treatment for those clients who have nowhere else to turn but public providers.

In addition to the complex dynamics produced by a mix of ownership forms, the interactions of specialty (ESAFs) and nonspecialty (NESAFs) providers can also shape long-term capacity. NESAFs can quickly add to drug treatment capacity by converting resources previously used for other types of health care or social services. Conversely, capacity in NESAFs can be readily withdrawn if other services closer to the primary mission of the facility are seen as more profitable or otherwise more rewarding.

Over the past decade, NESAF providers appear to be growing more involved in drug treatment. Admission rates to general hospitals for patients with diagnoses of drug dependency and nondependent drug abuse more than doubled between 1979 and 1985 (Gfroerer et al. 1988). Similar increases are reported for psychiatric specialty hospitals. This growth appears to be encouraged by a variety of factors, including declining admissions for physical illness, increased insurance coverage of drug treatment, and an increasing demand among employers who wish to contract for packages of services that include treatment for alcohol and drug abuse along with other types of treatment (Droste 1989; Dorwart

and Schlesinger 1988; Morrissey and Jensen 1988; Wallace 1985; Tatge 1985).

Although this expansion is clear, the determinants of NESAF growth are not well understood. Are NESAFs serving a new group of clients who have only recently entered the treatment system, or are they substituting for ESAFs that have not expanded quickly enough to meet growing demand? Are NESAFs treating mostly publicly or privately financed clients? Is this growth more influenced by factors from within or outside the drug treatment system?

To begin to explore these issues, we have constructed some simple empirical models relating the extent of NESAF involvement in alcohol and drug abuse to the capacity of ESAF providers in the State in which they are located. For simplicity, we used data from the 1986 IMHO to measure NESAF involvement; as detailed above, this represents most inpatient and virtually all outpatient treatment within NESAFs. ESAF capacity is measured in terms of the number of outpatient treatment slots and the number of inpatient beds per capita reported for the State in NDATUS. If there is, in fact, substitution between NESAFs and ESAFs--that is, if they are serving an overlapping clientele--one would expect less NESAF involvement in the States with greater ESAF capacity.

To explore the nature of this substitution further, the models also include a variable that measures the amount of State spending on drug treatment and the proportion of ESAF capacity in Government-operated facilities. These Government facilities serve almost exclusively publicly funded clients. If NESAFs are entering the drug treatment arena primarily to serve private-pay clients, then the more ESAFs are operated by Government (and thus the fewer that are serving private-pay clients), the greater the NESAF involvement. Conversely, if NESAFs are serving primarily publicly financed clients, then a larger number of Government-operated ESAFs should be associated with lower NESAF involvement, as one substitutes for the other. Similarly, if NESAFs serve

primarily private-pay clients, their involvement should be unrelated to the amount of State government spending, controlling for ESAF capacity.

Finally, to examine the influence of factors from outside the drug treatment system, we examined the relationship of NESAF involvement to market conditions for their primary services. For IMHO facilities, this involves the market for mental health care. A measure of market concentration (Herfindahl index) for these services was constructed, defining the county as the local market area. Lower values of the index (which ranges from zero to one) represent a less concentrated and, in theory, more competitive market. If NESAFs are driven into the market for alcohol and drug abuse by market pressures for their primary services, this should be reflected in the coefficient on this variable.

These independent variables are incorporated into two regression models--one for inpatient care and one for outpatient care (tables 2 and 3). The results presented here use the proportion of patients with a primary diagnosis of alcohol and drug abuse as the dependent variable. (Comparable regressions using a dichotomous variable measuring whether there was any treatment of alcohol and drug abuse in the NESAF yielded similar results.) The findings from these regressions indicate that there actually is substitution between NESAFs and ESAFs--the greater the ESAF capacity, the lower the NESAF involvement. This substitution appears to involve primarily private-pay patients. When more ESAFs are operated as Government facilities, NESAF involvement in both outpatient and inpatient treatment for drug abuse is substantially larger. This interpretation is supported by the finding that the amount of State spending is not strongly related to NESAF involvement. (There is a weak relationship for inpatient care, suggesting that these facilities are treating at least some publicly financed patients.) Finally, the regression models demonstrate the extent to which market conditions in a NESAF's primary market alter its propensity to treat drug abuse. Interestingly, however, this

relationship was not in the direction hypothesized. NESAFs facing low competition (a higher Herfindahl index) were more likely to treat alcohol and drug abuse.

Although these findings must be treated as only preliminary, given the crudeness of the models and limitations of the data, they reveal some important characteristics of the interaction between NESAFs and ESAFs. The two types of facilities do appear to serve common patients, in the sense that NESAFs and ESAFs substitute for one another. This suggests that NESAFs could be used to expand capacity for drug treatment. However, because NESAFs appear to substitute primarily for patients who are funded from private sources, the potential for expanding capacity for publicly financed patients is much less clear. Moreover, since capacity in NESAFs is affected by the market conditions for their primary services, which may fluctuate in ways outside the control of officials responsible for the treatment of alcohol and drug abuse, the reliability of this capacity could also be questioned.

Unanswered Questions Involving Capacity

The new perspectives and data presented here add to our understanding of capacity for drug treatment. But there remain many important aspects of capacity that are largely unstudied and that require additional research.

Several of these aspects involve static measures of capacity. Most past reports and studies describe treatment capacity for the Nation as a whole, but national statistics can mask considerable variation in capacity. Drug treatment capacity varies widely from State to State, as reflected in data from NDATAUS (table 4). Delaware, for example, apparently has no hospital beds in alcohol and drug abuse units, and Montana has only one bed for every 273,000 people. In contrast, Pennsylvania has one bed for every 2,846 residents, and North Dakota has one per 5,658 population. Similar variations exist for residential and outpatient treatment. The District of Columbia provides one

outpatient slot for every 258 residents, but West Virginia has only one for each 11,767 citizens (NIDA 1989b).

Even State-aggregated measures are too broad to be useful standards for judging capacity. Although we know relatively little about the service areas of most drug abuse treatment clinics, these areas are certainly not nationwide. Most urban outpatient clinics probably draw all their clients from their immediate neighborhoods. Thus, it is vital to collect information on the areas from which clinics draw their clients for a better assessment of where there are gaps in current capacity. There is currently no process for regularly collecting this information.³

A second important gap in our understanding of treatment capacity relates to the role of NESAFs. We have established that they treat a set of patients that overlaps with that treated by ESAFs. But we know virtually nothing about how they treat these patients--that is, how the cost and quality of treatment in NESAFs compares with that in ESAFs. Some differences are likely to occur. Studies of the treatment of other mental illnesses suggest that nonspecialists treat these conditions in a systematically different manner than do specialists (Ridgely et al. 1987; Leaf et al. 1985). This pattern may also apply to specialized versus nonspecialized facilities. Without knowing anything about the nature of drug treatment in any setting, however, it is impossible to determine whether it would be appropriate to expand or contract the role of NESAFs in the treatment system.

Other unanswered questions involve dynamic definitions of capacity. To what extent is the overall capacity in the system able to expand in the case of growing need or to shift resources to treat newly emerging forms of alcohol and drug abuse? Do ongoing changes in the mix of ownership, public and private financing, or specialization of providers affect this responsiveness? How do the various social, economic, and demographic characteristics of communities affect the development of treatment capacity? Consider one

important example. Our preliminary analysis suggests that NESAFs respond to factors that are related to their primary service mission and that may be largely unrelated to alcohol and drug abuse per se. As a result, capacity may fluctuate in ways that are unrelated to the need for drug treatment and largely outside the control of public officials responsible for providing this treatment. Because NESAFs represent three-quarters of the inpatient capacity and just under half of the outpatient capacity for drug treatment, it is essential that we better understand the influence of these external conditions.

RELATIONSHIPS BETWEEN NEED AND CAPACITY IN A COMPLEX TREATMENT SYSTEM

To assess the adequacy of current capacity, it is important to understand the extent to which capacity will actually be used. This introduces yet another set of difficult issues--some conceptual, some related to problems of measuring a behavior that is illegal and socially stigmatized.

Perhaps the most fundamental conceptual issue involves whether capacity should be compared against measures of need (that is, the number of people abusing drugs in a community) or demand (that is, the number of people who express a willingness to seek treatment). The two standards imply markedly different criteria for the treatment capacity. The ECA study suggests that over a 6-month period, less than 15 percent of all those with problems of drug dependency or drug abuse seek treatment (Locke and Regier 1985). Less than half of all arrestees who test positive for drug use report that they "need treatment"--despite having an obvious incentive to profess a need for treatment given that they face prosecution (O'Neil and Wish 1989).

The tension between the standards of need and demand replicates a tension that has long existed in health services and health policy generally. It is, however, particularly difficult to resolve for

alcohol and drug abuse. On one hand, many Americans view the use of illicit drugs as prima facie evidence of impaired judgment, suggesting that need is a more plausible standard than demand. On the other hand, although one can try to force reluctant drug users to seek treatment, many will be difficult to identify and hard to keep in treatment if they are unmotivated. Although policies can be designed to encourage more treatment of those "in need," even the most optimistic estimates suggest that no more than half of those with drug problems are suitable candidates for treatment (White House 1989).

In practice, most efforts to estimate the appropriate amount of drug treatment capacity rely on a two-step process. The first stage involves some estimate of the need for treatment; the second stage identifies the portion of those in need who are good candidates for treatment. This process in itself involves addressing some issues that are difficult to resolve. As with mental illness, definitions of need are partly shaped by changing societal assessments of the acceptability of particular forms of behavior (Cleary 1989). This is especially true in addressing issues of alcohol and drug abuse.

Estimates of Need at the National Level

The most commonly cited estimates of need are based on NIDA's National Household Survey, conducted at 3-year intervals. This survey reported that 14.5 million Americans were "current users" of illicit drugs in 1987 (NIDA 1988). This finding has been criticized on two grounds: first, the survey omits groups who would not be "at home" to participate; and second, as drug use becomes less socially acceptable, respondents are more likely to underreport their drug use. It has been estimated that this leads to an undercounting of people with drug problems by as much as 200 percent (Committee on the Judiciary 1990).

The proportion of drug users who are thought to need treatment varies greatly, depending on the criteria applied to determine when drug use

represents drug abuse. Some State and local officials have proposed mandatory treatment for all individuals found to use illicit drugs. A similar stand has been taken by some Federal officials, who would label all drug use by adolescents as "abuse." This application of the notion of "zero tolerance" has emerged from the criminal justice model, but its applicability to treatment is a matter of considerable debate. Most experts in alcohol and drug abuse argue that many who use drugs such as cocaine neither seek nor need treatment to stop or control its use (Shaffer, personal communication 1990).

"Need for treatment" is most often defined for calculating national estimates of need in terms of frequency of drug use. The standard often applied is that those who use drugs on a daily or near-daily basis are in need of treatment. Using this criterion, the 1989 White House report, *National Drug Control Strategy*, stated that roughly 4 million Americans had "serious drug problems" (White House 1989). This estimate was based on responses to the National Household Survey. As noted above, this is almost certainly an underestimate of the true number of frequent users.

In addition, it is not clear that near-daily use is the appropriate standard for determining need for treatment. Daily use of marijuana may be no better an indicator of need for treatment than daily use of alcohol; those who do need treatment will often fall in this category, but many daily users may remain perfectly functional and satisfied with their life situation. Conversely, a number of those who report themselves to be weekly drug users could be viewed as appropriate candidates for treatment. As noted earlier, drug treatment appears in at least some cases to be more effective for those who are less frequent drug users. Because a nontrivial proportion of those who are currently weekly users will become daily users, early intervention involving treatment for less frequent users may prove a more effective strategy for limiting drug abuse than treating only those who have progressed to the stage at which they are labeled "drug abusers."

Many more people report themselves to be weekly users than daily users. For cocaine, for example, responses from the National Household Survey suggest that 4 percent of the 8.2 million people who used cocaine in 1988 used it nearly daily, whereas 11 percent used it weekly. Even if a relatively small percentage of weekly drug users were to be judged appropriate candidates for treatment, this would add several million people to the population in need.

A different estimate of need can be obtained from the ECA study, which used a specially structured questionnaire designed to identify problems of alcohol and drug abuse and mental illness through personal interviews. Based on ECA data, it has been estimated that roughly 3.8 million Americans had problems of drug abuse or drug dependence in 1980. (Because dependence did not necessarily involve illicit drugs, this estimate is lower than the near-daily use estimate from the National Household Survey.) It is difficult to determine how much drug use has changed since 1980. Responses on the National Household Survey suggest that drug use rose in the early 1980s and then fell in the latter part of the decade to levels close to those in 1980. This may, however, have represented a growing unwillingness to discuss drug use rather than an actual change in use. (Other statistics, cited later in this section, suggest sharply increasing rates of use.)

Having defined a population in need, most assessments then identify a subset who are considered suitable candidates for treatment. For example, the 1989 *National Drug Control Strategy* report, having defined 4 million Americans as having drug problems, argued that only 2 million were suitable for treatment in the sense that a "well-designed treatment may offer a reasonable chance of significant improvement" (White House 1989, p. 39). One million of the 4 million were considered unsuitable because they were unmotivated to stop using drugs; another million were so deemed because they did not need a formal program to quit. Given what little is known about the natural history of drug use and the

effectiveness of treatment, this broad partitioning is obviously highly speculative.

Estimates of Local/Community Needs

As noted in the previous section, the accessibility of drug treatment must be defined in local terms, given that the actual service areas of most treatment facilities are likely to be relatively limited. Unfortunately, there currently are no estimates of need for treatment at the local level. The ECA covered only five communities. NIDA's Household Survey is national in scope, but even a sample of more than 8,000 is far too small to construct accurate estimates of drug use in local areas.

It would be possible to use data from these population-based surveys to identify sociodemographic characteristics of drug users (and of drug users who seek treatment). The separate influence of each sociodemographic variable could be estimated through multivariate statistical methods. These relationships could then be used to predict differences in prevalence rates among communities based on the sociodemographic characteristics of those communities.

This use of community characteristics to predict need has been pursued most actively for mental illness. Efforts to develop sociodemographic indicators of mental health needs are almost two decades old, beginning with the Mental Health Demographic Profile System developed at NIMH in the early 1970s (NIMH 1984; Rosen et al. 1979). Although this research has been able to predict only a small amount of the variance in mental illness among communities, it has proven useful for examining the relationship between need and capacity in mental health care facilities.

Measures of Need Based on Special Populations

Several ongoing programs of data collection offer some potentially useful, albeit not necessarily

representative, information about variation in need across communities. The Drug Abuse Warning Network (DAWN), maintained by NIDA, collects data on drug use and drug abuse deaths from samples of hospital emergency rooms and medical examiner reports for 27 metropolitan areas. The Drug Use Forecasting (DUF) system is maintained by the National Institute of Justice at the U.S. Department of Justice and collects data on random samples of arrestees tested for drug use. Initiated in 1986, this network originally included 16 cities, but it will be expanded to 25 cities by 1991 (O'Neil and Wish 1989).

For a limited number of localities, these networks offer some useful information about the extent of drug use. Obviously, however, neither one collects information from a representative sample of the population in these communities. Each captures, in a slightly different sense, extreme behavior -- DAWN, by measuring drug use associated with medical emergencies or deaths; DUF, by measuring drug use among those engaged in criminal behavior, who have been shown to have much higher drug use than the general population.

We have no way of knowing whether differences among communities or over time in these extreme populations reflect corresponding differences in the overall rate of drug use in the community. For example, reports from emergency rooms through DAWN indicate that between 1984 and 1988, cocaine-related incidents increased sixfold (NIDA 1989c). Although NIDA's Household Survey confirms an increase in the number of heavy cocaine users during this period, this increase was on the order of 25 to 30 percent--an order of magnitude less than that reported through emergency rooms. It cannot be determined whether this disparity reflects underreporting of drug use on the survey or an increase of cocaine use limited to groups most likely to use emergency rooms. (Changing patterns of cocaine use, associated with the spread of "crack" cocaine, accounted for only a portion of the increase reported in DAWN. Even if one excluded all reports for either smoking or injecting cocaine, reported cocaine incidents

increased over 250 percent between 1984 and 1988.)

These indirect measures may thus be capturing behavior among separate groups of drug users. There is considerable variance between the drug use rates implied through DAWN and DUF reports, as well as between the medical examiner and emergency room reports in DAWN. The 14 cities in common to the two reporting systems are listed in table 5, ranked according to the prevalence of drug incidents. Emergency room incidents appear to be relatively unrelated to either of the other two measures.

Emergency room use is obviously affected by various characteristics of the health care system, including the availability of emergency rooms and the extent of health insurance coverage. (Those with private insurance are much less likely to use emergency rooms as a regular source of medical care.) Even if one controls for some of these differences, there is a relatively low correlation among emergency room incidents, medical examiner reports, and test results for arrestees.

Medical examiner reports and tests of arrestees are more closely linked (Committee on the Judiciary 1990). Here too, however, there are some significant anomalies. Chicago and New Orleans, for example, both have relatively high rates of arrestees testing positive for drug use but relatively few reports of drug-associated deaths. Nonetheless, these two measures track closely enough that they are probably measuring the same subpopulation, whereas emergency room reports may be capturing a very different group of drug users. It is unclear which is more important for predicting either need or demand for drug treatment. About half the patients with reported drug involvement in the emergency room are admitted as inpatients (Gfroerer et al. 1988). Roughly 40 percent of those who seek treatment report recent involvement with the criminal justice system (Committee on the Judiciary 1990).

Despite their limitations and potential sources of bias, data from DAWN and DUF make it possible

to establish some picture of variations in drug use among major urban areas. By constructing comparable measures of capacity for these cities, it would be possible to explore some of the causes of and implications for differences in need and capacity on the local level. In addition, patterns of need identified through these reporting systems could be used to extrapolate to other communities not included in DUF and DAWN. This approach is limited, however, by the fact that both reporting systems draw data primarily from large metropolitan areas, which are not representative of the rest of the country (Committee on the Judiciary 1990).

Measures of Need Based on Program Performance

Although population-based predictors of need for drug treatment have considerable promise, they have been little explored in past research and largely ignored in policymaking. Policymakers have instead focused on measures using data from treatment centers. But these have severe limitations as even indirect measures of unmet need, and their shortcomings have been exacerbated by the changing nature of the drug treatment system. To illustrate, we consider here two commonly cited program-based measures: waiting lists for treatment and utilization rates in treatment centers.

Long waiting lists are commonly cited as evidence of inadequate capacity, particularly in large metropolitan areas (Marriot 1990). Such lists have come to be viewed as warning signs of such importance that in the past year, eight U.S. Senators from the Committee on Labor and Human Resources specifically requested that NIDA collect information on waiting lists that would be representative of the care available in each State.

The nature of drug addiction raises some questions about the accuracy of waiting lists as a measure of unsatisfied demand. The direction of the bias, though, is uncertain. On one hand, individuals may initially seek care but, if not immediately treated, become discouraged and lose interest in treatment. Thus, many names on a waiting list may

no longer represent active candidates, so the list overestimates true unmet demand. On the other hand, if individuals know there is a waiting list and are unwilling to wait for treatment, they may never even apply to the center. These could be termed "discouraged clients."⁴ If their number is large, waiting lists would thus underestimate true unmet demand.

These problems are exacerbated by characteristics of the current treatment system. Because there are no "catchment areas" for providers, a number of agencies may serve a given neighborhood. As a result, a potential client may enter the waiting list at a number of centers to increase the odds of receiving treatment sooner. Adding together these waiting lists would count that person several times, causing unmet need to be overestimated.

Providers' motivations may also affect the usefulness of waiting lists as a measure of unmet need, an issue becoming more important as the proportion of providers operating for profit increases. Profit-maximizing providers are more likely to select the most profitable patients for treatment. Maintaining a large waiting list becomes a tool for doing this: without appearing to turn away clients, administrators can select from the waiting list the patients who are most profitable because they can pay more for treatment or will be less costly to treat. This strategy has long been used in the nursing home industry (Vladeck 1980).

A second commonly used indirect measure of unmet need has been utilization rates at treatment centers. It is often argued, plausibly enough, that if drug treatment agencies in a community are operating near full capacity, they are probably forced to turn away at least some clients. But the opposite conclusion does not necessarily follow--that where utilization rates are low, there is no substantial unmet need. This potential asymmetry is again created by the motivations of drug treatment providers. Not all clients are equally appealing to service providers; some are unprofitable to treat. Particularly for outpatient agencies, where fixed costs are low, profit-maximizing providers might prefer no

patient at all to one on whom they might lose money. Other potential clients may be undesirable to providers because they do not "fit in" with current patients, because of social class, behavior, or skin color and treating them might lead to an exodus of other, more profitable clients. This situation is most likely to occur with inpatient treatment, particularly in longer-term residential settings, where prejudices become more pronounced because of shared living arrangements.⁵

Provider incentives and the fragmented structure of the current drug abuse treatment system may thus seriously distort program-based measures of unmet need. To collect more accurate data on adequate capacity, it would be necessary to introduce some independent point of data collection. It has been proposed that the treatment system have a "single point of entry" in each community (White House 1989), a designated agency that would serve as "case manager" and assign clients to a particular treatment site or choice of sites. Whatever the merits of such an agency for matching client needs and treatment styles, it could provide data on the demand for treatment that is unbiased by providers' financial incentives. The case management agency also could collect information on the time required to place particular clients, the amount of choice the clients had among treatment sites, and other relevant measures of accessibility.

Measures of Need and Needed Measures

With the data that are currently available, it is difficult to assess the magnitude of the need for drug treatment, even at the national level. And it is impossible to estimate this need accurately at the community level. Yet it is at this local level that accessibility of treatment must be defined, because most drug users seeking treatment will do so within a relatively circumscribed geographic area. It is thus essential to begin developing population-based estimates of local need for treatment. Even if relatively crude, these estimates would provide important guidance in shaping the growth of the drug treatment system. Their

obvious limitations, however, suggest the need to complement these population measures with measures drawn from the treatment system, such as average waiting time to receive treatment. For these program-based measures to be even minimally valid, however, they must be drawn from data other than those maintained by the treatment agencies. This will virtually necessitate either developing a single-point entry system or requiring that those paying for services (public programs or private insurance) directly monitor access to treatment and measure the delays in obtaining treatment for those whose care they finance.

STRATEGIES AND STRUCTURES FOR THE DRUG TREATMENT SYSTEM

Historically, changing conceptions of the drug treatment system have altered goals and methods of treatment. As discussed earlier, these altered goals and methods have, in turn, reshaped the standards for accessibility and adequate capacity that are reflected in public policy. The contemporary drug treatment system embodies an accumulation of different models and philosophies. As a result, it incorporates no clear standards for adequate capacity, and public policy toward capacity has been equally ill defined.

Developing more coherent public policies involves more than simply addressing the specific issues and ambiguities detailed earlier in this paper. It requires thinking more broadly about the appropriate structure of the drug treatment system. This is important for several reasons. First, none of the more specific questions of program design and definition of accessibility can be answered independently. For the treatment system to function effectively, it is important for it to embody a certain consistency of structure.

Second, drug treatment is provided in a diverse array of organizational settings. To the extent that particular organizations embody specific notions of an appropriate service system, it is useful to make

these differences explicit. For public policy to be effective with a heterogeneous set of service providers, policies must reflect their varied practices as well as the various ways in which they respond to changing external conditions.

Finally, because drug problems typically occur in tandem with other health and social problems, the drug treatment system must relate to the systems that finance and deliver other health and social services. The more compatible the system for drug treatment is with these other systems, the more readily they can all be integrated and the more straightforwardly drug problems can be addressed in the context of other health and social ills. This may merit actively shaping drug treatment to be compatible with these other service arrangements.

Historically, American public policy has defined three broad models for structuring the delivery of services in which there is seen to be an important societal interest. Because each model has been used and endorsed by policymakers in the past, each offers a legitimate alternative future for the drug treatment system. Each embodies various combinations of financing arrangements, control over the service delivery system, and choices about how clients and services are to be matched.

The Public Utility Model

Under this model, the public sector acts as the primary source of services for all Americans, although it may be supplemented by private firms for those persons who have special needs or are willing to pay for alternative arrangements. This approach underlies a variety of service systems, including water and power utilities and primary and secondary education, as well as early conceptions of the community mental health system. Financing may be primarily through taxes (as with education) or from private sources (as with electric utilities). The emphasis in this model is on standardization of access for people throughout the country, coupled with the benefits of having all people served by a common system in which they all have a stake. The system relies

on strong local control by the community (through elected boards or other forms of oversight) but ensures quality largely by having better-off clients served by the same system that serves those with fewer financial resources and less political voice.

The Medical Care Model

Under this model, private sector financing and private providers are the backbone of the system. Private employers are primarily responsible for purchasing services and maintaining broad accountability over the service system (often through an insurance company that serves as fiscal intermediary). An array of private agencies provides services, subject to licensure requirements and some Government regulation of new entry. The primary responsibility for quality is vested in service providers and embodied in a process of professional education. The public sector plays a residual role, providing services only to those unable to obtain services under private auspices. There is a strong emphasis in this model on consumer sovereignty and choice for clients whose treatment is paid through both public and private programs.

The Social Services Model

This model has evolved for the delivery of a variety of social services, ranging from day care for children to meals-on-wheels for the elderly. Under this model, the public sector is the primary purchaser of care (typically through State or local governments, using matching grants from Federal sources), but most services are provided by private agencies. A substantial share of services, however, is purchased by individuals, who pay for them from their own resources. The State plays a major role in regulating the quality of the services purchased with both public and private dollars. Agencies providing services to publicly supported clients are typically designated to serve all clients in a particular area. Clients have limited choice among these providers. Those purchasing services privately, however, have much greater choice but

are often required to purchase care from Government licensed and regulated agencies.

Although acute medical treatment has fallen primarily within the second model described above, mental health care has embodied all three of these models at various points over the past three decades. Similarly, the drug treatment system in the United States has evolved from a public utility model in the 1960s into a social services model in the 1970s, and, most recently, toward a medical model in the 1980s. These shifts have been largely a product of happenstance; there has been little effort to clarify the goals of these models or to choose among them carefully to improve the accessibility or efficacy of drug treatment. As a result, the existing drug treatment system is unlike any one of these archetypes, yet it contains bits and pieces from all of them. Shaping it to become more like any one model would require some fundamental changes in current policies and practices. It would also have important implications for the overall level and nature of capacity.

For example, to move entirely to the medical care model, it would be necessary to establish sufficient capacity not only to treat all expressed demand, but also to provide some real choice among providers. Each community would need not just one accessible provider but several, preferably offering choices among treatment modalities. There would be greater emphasis on defining professional norms of appropriate treatment and establishing professional associations to serve in an oversight role. Financing would be primarily through insurance. Gaps in private insurance would be filled by Government requirements that employers offer coverage, coupled with public programs like Medicaid or Medicare for those who do not work. Clients could be assigned to or encouraged to find a "regular source of care"--the equivalent of a primary care physician--who would help to assess their needs regularly and guide them through their treatment options.

Returning to the public utility model, in contrast, would require an expansion of both public

financing and ownership. It would involve establishing a network with catchment areas serving all parts of the country, equivalent to original plans for CMHCs in the 1960s (Foley and Sharfstein 1983). A single agency in each catchment area would be responsible for contracting for a full array of services and assigning clients to appropriate treatment. The system would be structured to channel clients of varying backgrounds but with similar needs into common treatment programs, eliminating the current two-tiered treatment system that exists between publicly and privately funded treatment. A public utility model might operate under some form of local governance, comparable to local school boards.

Each of these models has its generic strengths and weaknesses. Each has been favored by Federal policymakers at different points over the past 30 years, and each has its proponents today. Efforts to expand private insurance coverage of drug treatment, for example, have clearly encouraged the spread of the medical model. In contrast, the President's Commission on AIDS (acquired immune deficiency syndrome) recommended in 1988 that a national treatment system be established to reduce the spread of intravenous drug-related AIDS, a system described in terms most compatible with the public utility model. The advantages and disadvantages of these different models have been explored for other health and social services but have received little attention in past discussions of drug treatment (Schlesinger and Dorwart 1989; Gibelman and Demone 1989).

Given how little we know about practices and provider behavior within the drug treatment system, let alone how such practices are related to socially valued outcomes, it is difficult to assess how well each model could serve as a guidepost for the evolving drug treatment system. Implicitly, however, recent public policies have favored one particular model: treating drug treatment as acute medical care. This shift has been partly driven by political expediency, as redefining drug use as a medical problem allows it to be covered by private insurance and not to burden Government budgets.

In part, the shift toward a medical model also reflects changing professional conceptions of the appropriate forms of drug treatment.

The redefinition of drug problems in medical terms clearly has some desirable features. It taps into significant private resources (through employer-based health insurance) at a time when Government budgets are seen as limited. It introduces private actors, such as EAPs and insurance companies, that can monitor the adequacy of treatment being purchased. It encourages the establishment of treatment programs at a number of community hospitals and CMHCs, introducing programs to some communities and neighborhoods where treatment otherwise would have been inaccessible.

But a medicalization of drug treatment carries liabilities as well. Some of these are inherent in the medical model. To the extent that drug use is a chronic condition, there are important questions about whether it can be adequately incorporated into private health insurance without creating incentives for inappropriate care (McGuire et al. in this volume; Schlesinger 1986). The medical model encourages a multi-tier treatment system based on who is paying for the treatment. It fosters competition among treatment programs, encouraging private providers to select only the most profitable patients for treatment and to "dump" the others to Government-run programs. It fragments treatment among a large number of providers, who may have very different ideas about appropriate treatment. This fragmentation makes it difficult to monitor the treatment that is provided, as there is little standardization and there are potentially large differences in content by type of client or source of payment.

Some of the problems created by applying the medical model to drug treatment result because this model has been only partially adopted. Currently, there is no equivalent of the "family physician" to diagnose drug problems and guide patients to the appropriate form of treatment. At best, there has been uneven professionalization of those providing treatment and administering

programs, raising serious questions about the quality that is provided.

It is important that some effort be made to weigh these strengths and weaknesses, to decide if drug treatment should continue to be medicalized. This would require Federal policymakers to exert more direction over the treatment system than they have done for the past decade. To do this, they must also regularly collect more complete data on the capacity and accessibility of treatment.

CONCLUDING THOUGHTS AND ISSUES

This paper has highlighted the gaps in our knowledge and the unanswered questions that must be addressed to ensure that drug treatment in this country is accessible to those who need it. Despite the limited information that exists, it is apparent that several new public policies would help achieve this goal. These include policies that foster greater mixing of publicly and privately financed clients at treatment facilities, requirements that ensure the availability of a full array of types of treatment in each community, and programs that create a single point of entry in each community. This entry point would, at a minimum, monitor the accessibility of treatment in each community and could also play a more active role in case management and quality assurance.

Equally important, however, is the need to define more clearly and comprehensively the broad models under which the drug treatment system evolves. The preferred model will partly depend on the answers to the specific questions raised earlier about how best to define accessibility in terms of how much choice clients should be allowed, how long clients should be viewed as being in treatment, and how much providers should be permitted or encouraged to specialize in the treatment of specific subgroups of drug users. The more important it is to measure and monitor accurately the need and capacity at the local level, the more desirable appears a structured system, such as the public utility model. The greater the

emphasis on client choice, however, the more attractive an *unstructured* system, such as that represented by the medical model. The longer the appropriate duration of treatment, the more drug abuse can be viewed as comparable to long-term care, with a strong social services base.

The choice among models of the drug treatment system also depends critically on how problems associated with drug use are seen as meshing with other health and social ills, and on how important it is to address all these problems in an integrated fashion. If drugs are seen as a medical illness or are closely associated with other physical or mental disabilities (Brown 1989), it will likely prove most effective to apply the medical model and to encourage drug treatment in facilities that also treat other types of mental and physical illnesses. If, however, the problem is seen as rooted in family disruption or other social problems, then drug treatment is perhaps better integrated within existing social services. Finally, if the drug problem is at heart a problem of communities, then the public utility model, with its emphasis on community-based catchment areas and local control, would likely be preferable.

No single model best addresses all of society's needs and concerns related to drug use. Balancing these various concerns, it may be most effective to develop some combination of the archetypical models described above. But some strategy must be established to encourage a more consistent public policy than there has been over the past decade. Without a clearly defined strategy, the drug treatment system will continue to evolve in a piecemeal fashion, with characteristics of some models and some types of programs undercutting the effectiveness of others. Without agreed-upon goals, it will be difficult, if not impossible, to determine when and where there is adequate capacity for treatment. Under such conditions, gaps and inadequacies in the treatment system will be inevitable. The costs of continued drug use are clearly too high for this Nation to continue to tolerate haphazard and inconsistent approaches for developing the capacity to treat drug problems.

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NOTES

¹ Logically, it might appear that methadone clinics would be an exception, given that they involve standardized treatment and often serve clients from a relatively broad region. In fact, however, both the need for various support services in addition to the methadone and the problems associated with the use of other drugs while on methadone would still argue for focusing greater resources on programs that serve clients from communities with higher rates of drug use.

² This last statistic may be either misleading or mismeasured. According to the 1987 NDATUS, a total of 6,193 clients were involved in treatment in correctional facilities. Other sources, however,

suggest much higher levels of treatment. The estimated proportion of prisoners in State facilities who were "under treatment" when the data were collected ranged from 6.2 to 11.1 percent (Jamieson and Flanagan 1989; Chaiken 1989). This represents between 29,000 and 52,000 prisoners in State prisons alone. Possible explanations for this discrepancy are that the definitions of treatment are very different in these surveys, that NDATUS undercounts treatment in correctional facilities, or that prisoners are being treated by agencies that operate under State contracts, and thus are counted as private agencies under NDATUS rather than as part of correctional programs.

³ A NIDA survey fielded in the summer of 1990 collected some data on service areas for a representative set of facilities from NDATUS. No comparable information, however, was collected from NESAFs not included in NDATUS, from private practitioners, or from self-help groups.

⁴ The analogy here is to "discouraged workers" in the labor market, who become so disheartened with their prospects for employment that they no longer report themselves as looking for work and thus are not counted in unemployment statistics.

⁵ Similar reasoning has been used to explain the abnormally low rates of nursing home use among minority elders.

⁶ In a number of other countries, including Finland and Sweden, medical care does not have a distinct system of organization but follows the same public utility model as education, with the same emphasis on local control (Anderson 1989).

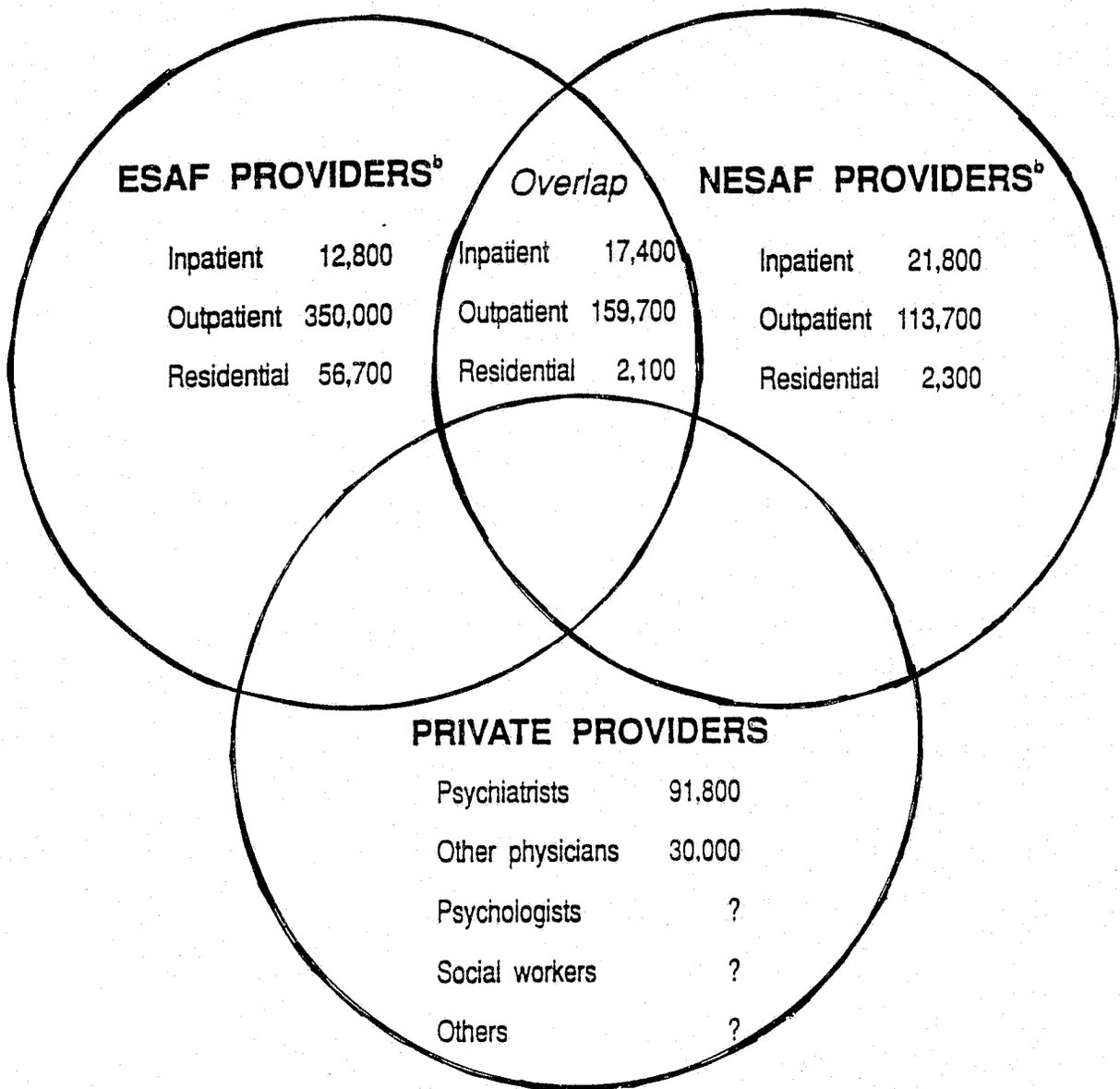


Figure 1. Treatment for alcohol and other drug abuse (estimated daily census for providers^a)

^aCalculated for general hospitals from total patient days. All numbers are rounded to the nearest 100.

^bInpatient comprises general hospitals, psychiatric specialty hospitals, and clinics, but it includes only patients with primary diagnoses of substance abuse. Secondary diagnoses would more than triple the number reported above.

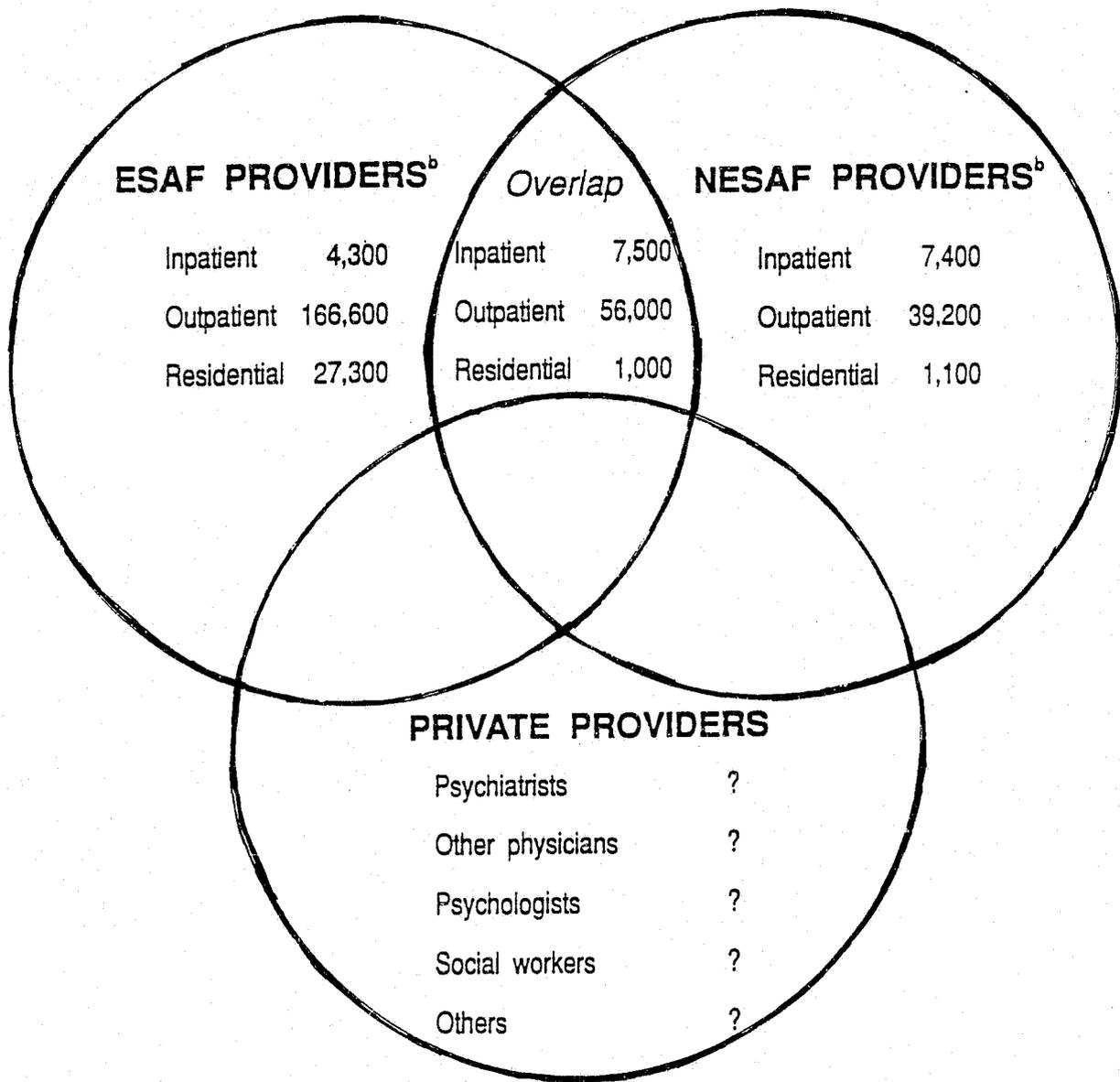


Figure 2. Treatment for drug abuse (estimated daily census for providers^a)

^aCalculated for general hospitals from total patient days. All numbers are rounded to the nearest 100.

^bInpatient comprises general hospitals, psychiatric specialty hospitals, and clinics, but it includes only patients with primary diagnoses of substance abuse. Secondary diagnoses would more than triple the number reported above.

Table 1. Variations in treatment of substance abuse in nonexclusive treatment facilities

Percentage of Patients With a Primary Diagnosis of Substance Abuse ^a (Highest and Lowest States)			
<u>OUTPATIENT CLINICS</u>		<u>INPATIENT HOSPITALS^b</u>	
The Highest States			
Indiana	25.2	Idaho	25.7
District of Columbia	24.7	Georgia	21.6
West Virginia	19.4	Utah	17.9
Wyoming	19.2	Wyoming	15.5
South Dakota	17.5	Louisiana	15.5
New Jersey	17.4	Delaware	15.3
North Carolina	15.7	Indiana	14.9
Georgia	15.1	District of Columbia	14.4
The Lowest States			
Colorado	2.0	Pennsylvania	0.5
Delaware	2.6	Oregon	2.1
Mississippi	3.3	Arkansas	2.1
South Carolina	3.4	Illinois	2.9
Pennsylvania	3.8	California	3.1
Connecticut	3.9	Arizona	3.2
Idaho	3.9	Alaska	3.3
Oklahoma	4.1	Maryland	3.3

^aCalculated by authors using data from the 1986 IMHO.

^bIncludes both psychiatric hospitals and general hospitals with psychiatric units.

Table 2. Regression model of the determinants of NESAF treatment of substance abuse: inpatient care in mental health care facilities^a

Independent Variable ^b	Estimated Coefficient (Standard Error)
Inpatient capacity of ESAFs in the State (per capita)	-0.077 ^c (0.041)
Outpatient capacity of ESAFs in the State (per capita)	-0.013 ^d (0.006)
Proportion of ESAFs operated by Government	0.113 ^d (0.016)
Per capita expenditures by State on substance abuse	-0.001 ^c (0.0007)
Market concentration of providers of inpatient mental health	0.012 ^c (0.007)
F-statistics for total regression	19.043 ^d
R-squared for total regression	0.053
Number of observations	1,694

^aProportion of patients with a primary diagnosis of substance abuse, estimated by ordinary least squares.

^bData on NESAFs from the 1986 IMHO. Data on ESAFs from the 1987 NDATAUS. Data on State expenditures on drug treatment from Butynski and Canova (1988).

^cStatistically significant at a 10-percent confidence level.

^dStatistically significant at a 5-percent confidence level.

Table 3. Regression model of the determinants of NESAF treatment of substance abuse: outpatient care in mental health care facilities^a

Independent Variable ^b	Estimated Coefficient (Standard Error)
Inpatient capacity of ESAFs in the State (per capita)	-0.056 ^c (0.042)
Outpatient capacity of ESAFs in the State (per capita)	-0.016 ^d (0.004)
Proportion of ESAFs operated by Government	0.058 ^d (0.017)
Per capita expenditures by State on substance abuse	0.0005 (0.0005)
Market concentration of providers of inpatient mental health	0.016 ^d (0.005)
F-statistics for total regression	9.969 ^d
R-squared for total regression	0.024
Number of observations	2,032

^aProportion of patients with a primary diagnosis of substance abuse, estimated by ordinary least squares.

^bData on NESAFs from the 1986 IMHO. Data on ESAFs from the 1987 NDATAUS. Data on State expenditures on drug treatment from Butynski and Canova (1988).

^cStatistically significant at a 10-percent confidence level.

^dStatistically significant at a 5-percent confidence level.

Table 4. Variations in treatment capacity for inpatient and outpatient facilities with formal substance abuse treatment programs

Ratio of Treatment Slots to Population ^a (Highest and Lowest States)			
<u>OUTPATIENT CLINICS</u>		<u>INPATIENT HOSPITALS^b</u>	
The Highest States			
District of Columbia	1:258	Pennsylvania	1:2,846
New York	1:273	North Dakota	1:5,658
Wyoming	1:620	District of Columbia	1:5,743
California	1:630	Indiana	1:6,465
Maryland	1:631	South Carolina	1:7,640
Arkansas	1:654	Minnesota	1:7,690
The Lowest States			
West Virginia	1:11,767	Delaware	No Capacity
Arizona	1:6,446	Montana	1:273,000
Alabama	1:5,129	Vermont	1:270,500
Minnesota	1:3,596	Rhode Island	1:65,000
North Carolina	1:2,375	Hawaii	1:48,273
Montana	1:2,281	West Virginia	1:33,649

^aCalculated by authors using data from the 1987 N DATUS.

^bIncludes both psychiatric hospitals and general hospitals with substance abuse units.

Table 5. Ranking of cities based on reporting of drug-related events, 1988: comparing rankings based on emergency room reports, medical examiner reports, and testing of arrestees

<u>Percent of All Emergency Room Episodes Involving Drugs^a</u>		<u>Percent of All Deaths Involving Drugs^b</u>		<u>Percent of All Male Arrestees Testing Positive for Drugs^c</u>	
New Orleans	1.27	San Diego	8.04	New York	83
Detroit	1.17	New York	6.32	San Diego	82
Los Angeles	1.13	Los Angeles	6.13	Philadelphia	81
Phoenix	1.12	Philadelphia	5.29	Chicago	80
Philadelphia	1.09	Detroit	4.05	Miami	75
New York	1.03	Miami	3.94	Los Angeles	75
Dallas	0.93	Phoenix	3.63	New Orleans	70
Chicago	0.80	Dallas	3.20	Cleveland	68
San Diego	0.79	Kansas City	2.68	Detroit	68
St. Louis	0.64	Cleveland	2.19	Dallas	66
Miami	0.53	St. Louis	2.12	Phoenix	63
		Indianapolis	1.53	St. Louis	56
		Chicago	1.49	Kansas City	54
		New Orleans	1.45	Indianapolis	54

^aFrom DAWN. Data from emergency rooms not available for Cleveland, Indianapolis, and Kansas City (NIDA 1989a).

^bFrom DAWN (NIDA 1989a).

^cFrom DUF (O'Neil et al. 1990).

Appendix Table A.1. Estimated average daily census for *inpatient care* at substance abuse treatment facilities

Type of Facility	Raw Counts From Surveys	Unduplicated Counts	Drug Abuse Only Unduplicated Counts
ESAF Providers			
NDATUS totals	30,210		
NESAF Providers			
Total NESAFs in other surveys	39,217		
Total mental health facilities	15,782		
Psychiatric hospitals ^a	(8,903)		
CMHCs/mental health clinics ^a	(4,813)		
Psychiatric units in general hospitals ^b	(2,066)		
Substance abuse units in general hospitals ^b	11,517		
Scatter beds in general hospitals ^b	11,918		
Overlap With NDATUS		17,404	7,482 ^c
Psychiatric hospitals		5,071	2,079
CMHCs/mental health clinics		816	220
Psychiatric units in general hospitals		0	0
Substance abuse units in general hospitals		11,517	5,183
Scatter beds in general hospitals		0	0
Omitted From NDATUS		21,813	7,395 ^d
Psychiatric hospitals		3,832	1,571
CMHCs/mental health clinics		3,997	1,599
Psychiatric units in general hospitals		2,066	888
Substance abuse units in general hospitals		0	0
Scatter beds in general hospitals		11,918	3,337
Exclusively Substance Abuse (NDATUS minus Overlap)		12,806	4,322

^aCalculated by the authors from the 1986 IMHO.

^bAggregate counts of patients with a primary diagnosis of substance abuse in non-Federal general hospitals was 19,142 (Rice and Kelman 1989) and in VA hospitals, 6,389 (Rosenheck et al. 1990). Patients in separate substance abuse units were calculated by authors from the 1987 NDATUS, totaling 11,517 in both VA and non-Federal hospitals. Patients in separate psychiatric units were calculated from the 1986 IMHO, totaling 2,066 in both VA and non-Federal hospitals. This leaves an estimated 11,918 patients treated in scatter beds.

^cEstimates based on ratio of drug and alcohol abuse clients in these facilities, calculated by the authors from the 1987 NDATUS.

^dThese are estimates based on the average proportion of substance abuse patients treated for drug abuse in these facilities. In non-Federal general hospitals, this was 28 percent (Rice and Kelman 1989); in VA hospitals, 19 percent (Rosenheck et al. 1990). Data from the author's National Mental Health Facilities Survey indicate that there are 41 percent in psychiatric hospitals and 43 percent in the psychiatric units of general hospitals.

Appendix Table A.2. Estimated average daily census for *outpatient care* at substance abuse treatment facilities

Type of Facility	Raw Counts From Surveys	Unduplicated Counts	Drug Abuse Only Unduplicated Counts
ESAF Providers			
NDATUS totals	509,675		
NESAF Providers			
Total NESAFs in other surveys	273,344		
Psychiatric hospitals ^a	18,913		
CMHCs/mental health clinics ^a	192,970		
General hospitals ^b	61,461		
Overlap With NDATUS		159,685	55,959^c
Psychiatric hospitals		3,933	1,757
CMHCs/mental health clinics		108,063	35,603
General hospitals		47,689	18,599
Omitted From NDATUS		113,659	39,232^d
Psychiatric hospitals		14,980	5,842
CMHCs/mental health clinics		84,907	28,019
General hospitals		13,772	5,371
Exclusively substance abuse (NDATUS) minus overlap		349,569	166,442

^aCalculated by the authors from the 1986 IMHO.

^bGeneral hospitals with psychiatric units were included in the IMHO. IMHO indicates that, on a given day, 32,142 patients are under treatment for a primary diagnosis of substance abuse at these facilities, but this count omits other general hospitals. Those most likely to treat substance abuse on an outpatient basis are facilities that also have an inpatient unit. American Hospital Association annual reports on facilities suggest that about half (48.5 percent) of the hospitals with outpatient substance abuse units (481 facilities nationwide) do not also operate a psychiatric unit, so they would not be counted in the IMHO (American Hospital Association 1989). Assuming that these omitted facilities are the same size as the average facilities reporting on NDATUS, they have an average daily census of 61 clients. This suggests that an additional 29,314 clients are treated as outpatients at general hospitals not included in the IMHO. Because some additional patients are treated in the outpatient departments of hospitals that have neither psychiatric nor substance abuse units, the estimate in the table is a conservative one.

^cEstimates based on ratio of drug and alcohol abuse clients in these facilities, calculated by the authors from the 1987 NDATUS. Percentages of drug abuse clients ranged from 33 percent in CMHCs to 39 percent in hospitals.

^dEstimates based on ratio of drug abuse and alcohol clients in these facilities, calculated by the authors from the 1986 IMHO.

Appendix Table A.3. Estimated average daily census for residential care at substance abuse treatment facilities

Type of Facility	Raw Counts From Surveys	Unduplicated Counts	Drug Abuse Only Unduplicated Counts
ESAF Providers			
NDATUS totals	58,194		
Exclusively Substance Abuse		56,097	27,263 ^a
NESAF Providers^a	4,373		
Hospital-based programs	264		
CMHCs-based programs	3,443		
Freestanding MH programs	666		
Overlap With NDATUS		2,097	1,018 ^b
Hospital-based Programs ^c		169	81
CMHC-based programs ^c		1928	937
Freestanding MH programs		0	0
Omitted From NDATUS		2,276	1,106 ^b
Hospital-based programs		95	46
CMHC-based programs		1,515	736
Freestanding MH programs		666	324

^aCalculated by the authors from the 1986 IMHO.

^bEstimates based on ratio of drug and alcohol abuse clients in these facilities, calculated by the authors from the 1987 NDATUS. Percentages of drug abuse clients averaged 47 percent of all clients in residential treatment programs for substance abuse.

^cBecause data on overlap for residential programs was unavailable, overlap was estimated from the extent of overlap for outpatient care in hospital and CMHC-based programs, presented in table A.2. For hospital-based programs, the overlap was 64 percent; for CMHC-based programs, 56 percent. If inpatient overlap estimates were used instead, the overlap would be closer to 40 percent.

COST-EFFECTIVENESS ANALYSIS OF DRUG ABUSE TREATMENT: CURRENT STATUS AND RECOMMENDATIONS FOR FUTURE RESEARCH

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Demands for more capacity to treat drug abusers have escalated sharply in response to large increases in cocaine use and concerns about the spread of the human immunodeficiency virus by intravenous (IV) drug users. These demands come at a time when the country is running a large budget deficit, many States are struggling to avoid budget deficits, and private insurers are under great pressure to restrain health care expenditures. In this climate of rising demand for drug abuse treatment coupled with severe limits on the availability of funds, scarce treatment resources must be carefully allocated so as to maximize their impact.

This is precisely the type of situation for which techniques such as cost-effectiveness and cost-benefit analysis have been created. In general, these techniques are methods for collecting, summarizing, and comparing information about both the costs and outcomes of interventions for solving a problem. *Cost-benefit analysis* refers to a family of procedures employed when both the costs and the benefits of an intervention can be measured and compared monetarily. In many circumstances, however, such as the case of drug abuse treatment, important outcomes cannot be easily assessed in monetary terms. In these situations, *cost-effectiveness analysis* techniques are used to assist policymakers in understanding the relationship between program costs, which are measured in dollars, and program impact, which is measured in other units.

Cost-effectiveness analysis is an evolving system of investigation rather than a standardized set of procedures (Yates 1985; Kamlet 1989).¹ While different authors take slightly different approaches,

There seems to be general agreement that cost-effectiveness analysis includes the following elements.

1. *Define the problem.* The nature and scope of the problem need to be clearly spelled out in order to judge the appropriateness of the interventions. This involves describing the boundaries of the problem, the population that it affects, and the mechanism with which it operates so that the problem and its effects can be distinguished from other problems. Ultimately, judgments about the cost-effectiveness of interventions must be gauged in terms of the success of the interventions in reducing the problem.
2. *Identify and define the interventions proposed for dealing with the problem.* This involves describing the philosophy, goals, and operationalization of all interventions being considered, and clearly defining their target populations.
3. *Identify the costs of each of the interventions.* This involves defining the resources necessary for implementing each of the interventions and identifying other associated costs, such as those borne by clients and society.
4. *Identify the outcomes of the interventions.* This involves defining the direct impact of the interventions on clients, as well as the indirect impact on those associated with the clients, such as family members, and on the larger society.
5. *Calculate cost-effectiveness of each program and compare interventions.* This involves separately aggregating costs and outcomes for each intervention so that the

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cost-effectiveness of each program can be calculated and the interventions compared.

Part I of this paper focuses on the fourth element of cost-effectiveness analysis listed above, which is to identify the outcomes of the interventions. This focus is due primarily to the virtual lack of information on the other elements. Given that other investigators have recently reviewed the literature on treatment effectiveness, Part I concentrates on the main findings from the reviews and on the quality of the research. Finally, it describes the few available cost-effectiveness studies and presents some tentative conclusions about the cost-effectiveness of drug abuse treatment.

Part II of the paper examines each of the elements necessary for conducting cost-effectiveness analyses of drug abuse treatment and outlines key issues that must be addressed for further progress to be made.

Computer searches were conducted on the following data bases: *Combined Health Information Database, Drug Information/Alcohol Use and Abuse, Drug Information Fulltext, Government Publications, Health Planning and Administration, Medline, PsychLit, Public Affairs Information Service, and Social Sciences Index.* All available years from 1972 on were searched in each data base. In addition, searches were conducted for us by the *Data Center and Clearinghouse for Drugs and Crime* and the *National Clearinghouse for Alcohol and Drug Information.* Most searches were limited to references dealing with "drugs" or "substances" and "abuse" or "addiction." For some searches, we further restricted references to those dealing with "treatment." Every data base was searched for citations dealing with "effectiveness," "benefits," and/or "costs." When the results of these searches yielded few relevant citations, the substance abuse literature was searched for concepts associated with the main components of cost-effectiveness analysis, such as treatment "outcome."

PART I: THE EFFECTIVENESS OF DRUG ABUSE TREATMENT

Anglin and Hser's Review of the Efficacy of Drug Abuse Treatment

The extensive drug abuse treatment literature was reviewed in a recent paper by Anglin and Hser (1990). Their indepth examination includes a history of drug abuse treatment in the United States, a discussion of methodological issues, a review of major evaluation studies, and a review of studies dealing with correlates of treatment outcomes. Anglin and Hser's findings are summarized here in order to describe the current state of knowledge about treatment effectiveness:

There is no simple cure for drug dependence.

Once drug dependence has developed, the problem can persist as a chronic condition, and relapse is often the rule.

The majority of clients in most treatment programs have traditionally been, and remain, opiate abusers.

Evaluation studies are mostly based on opiate users in methadone maintenance programs. However, findings regarding other drug dependencies and other modalities are typically consistent with those reported for methadone maintenance.

All major treatment modalities can be shown to have some positive effects on the clients in the criteria of drug use, criminality, employment, and other aspects of social functioning.

For most types of programs, the more time clients spend in treatment, the more positive are their long-term outcomes.

A significant proportion of those seeking treatment do not stay in treatment for more than a few weeks.

Dropout rates are high for all modalities except some methadone maintenance programs.

Clients entering treatment under legal coercion do as well as those without such pressures.

Typically, an intact marriage, a job, shorter drug use history, low levels of psychiatric dysfunctioning, and a history of minimal criminality predict a better outcome in most programs.

Demographics are related to likelihood of entering treatment but are only moderately associated with outcome.

Program characteristics, such as quality of staff, breadth of services, and morale, are often significant determinants of outcome.

In their review, Anglin and Hser identify and discuss serious methodological problems that have undermined much of the research they review. Although Anglin (personal communication, 1989) believes that, overall, the body of research strongly supports the efficacy of treatment, the pervasive methodological shortcomings of treatment research constitute a major problem for cost-effectiveness analysis of drug abuse treatment. The next section of this paper examines some of these common methodological problems as a step toward finding remedies that will enable valid cost-effectiveness studies to be conducted.

The Validity of Drug Abuse Treatment Outcome Research

Reviewers Are Critical of the Research Methods Used.

Many reviewers of drug abuse treatment research have been highly critical of the methods used and have urged caution in examining the findings. For example, Goldstein et al. (1984) reviewed all drug

abuse "intervention/outcome studies" published in "50 major journals between 1969 and 1979". After examining outcome research in three areas--drug abuse, alcoholism, and mental health--they concluded that "in general, drug abuse studies employ the least adequate methodologies" (p. 479). For instance, many studies relied on single measures of drug abuse, and these measures were often based on ambiguous, global categories that were probably insensitive to small changes. Data collection typically depended on sources, such as drug users' self-reports or institutional records, that have been shown to be of highly questionable reliability, and often (in 54 percent of the studies) only one dependent variable--drug use--was measured. Furthermore, approximately two-thirds of the studies did not collect followup data.

Goldstein et al. (1984) also classified the 234 drug abuse treatment outcome studies they located on the basis of the type of research design used. Nearly half the studies employed the weakest design in their classification scheme: "after intervention only; no controls." Only 15 studies, or 6 percent, used a design that incorporated random assignment of subjects to a comparison group, the strongest design in their scheme. "Perhaps the most striking finding is the high percentage of studies, regardless of therapeutic modality or type of concern, that do not employ any sort of controls in their research design. This finding is particularly pronounced among drug abuse studies" (p. 493).

Reviewers of the extensive literature on methadone maintenance have reached similar conclusions. For example, Hall (1983) states that "research on services in methadone maintenance has only reached the level where designs are sufficiently strong to allow some very tentative conclusions" (p. 620). In the same volume, Senay (1983) makes a similar point in reference to research investigating the relationship between treatment characteristics and outcome: "Explicit hypotheses concerning treatment-related variables have not been elaborated and studies of the treatment process employing random assignment, appropriate

blinds, etc., have not been carried out" (pp. 565-566). In a critique of a literature review, Kleber (1983) stresses the fact that the studies reviewed lack the rigor needed to draw clear conclusions concerning the association between patient characteristics and outcomes.

Other reviewers of specialized drug abuse treatment research have also reached similar conclusions. For example, Davidge and Forman (1988) found some evidence of effectiveness in their review of psychological treatment of adolescent substance abusers, but they caution the reader that "conclusions that can be drawn as a result of existing research are tentative and limited because of the small number of studies available and because of serious methodological problems with these studies" (p. 52). Childress et al. (1985) also found promising approaches in their review of behavioral therapies for substance abuse, but they add that "in general, there have been too few well-controlled studies of combined behavioral interventions to permit final conclusions about their overall effectiveness in alcohol and drug abuse patients" (p. 959).

An Example of Typical Methodological Problems.

One way to illustrate the types of methodological problems that characterize treatment evaluation research is to consider a single study that manifests many of these problems. The Drug Abuse Reporting Program (DARP) was selected for this purpose, not because this work was especially flawed, but because it was a very large, well-funded, frequently cited project and the methodological problems in the design are still commonly found in evaluations of drug treatment.

DARP (Sells 1974; Sells and Simpson 1976) studied approximately 44,000 admissions to 52 drug treatment programs from 1969 to 1973. Located throughout the United States and Puerto Rico, the DARP treatment programs included a majority of all federally supported programs. The programs were classified as (1) methadone maintenance, (2) therapeutic community, (3) outpatient drug-free, or (4) outpatient

detoxification. Posttreatment followup interviews were completed with 4,627 clients from 34 treatment programs, comprising 61 percent of a target sample (Simpson and Sells 1983). These face-to-face followup interviews were conducted 5 to 7 years after entrance into the DARP system. All data were retrospective, month-by-month self-reports. The study grouped subjects by treatment modality and also included an intake-only comparison group that consisted of clients who completed admission procedures at a program but did not return to receive treatment in the DARP system.

The DARP study produced several dramatic findings. For example, Simpson and Sells (1983) report that substantial reductions in opiate use occurred:

Opioid drugs (primarily heroin) were used daily by 70% of the total sample during the 2 months before DARP (13% used opioids less than daily, and 17% used nonopioids only); only half as many (35%) used opioids daily during 1 or more months of the first year after DARP, and this percentage declined over time to 17% in the last year before the follow-up interview.

Another major finding was that comparable outcomes were observed for methadone maintenance, therapeutic community, and outpatient drug-free programs, and the outcomes for these three modalities were significantly more favorable than those for outpatient detoxification treatment and the intake-only comparison group. Treatment tenure proved to be an important factor. Treatment lasting less than 90 days was ineffective, but when it lasted more than 90 days, outcomes became more favorable as the length of time spent in treatment increased. Finally, pre-DARP criminal history was found to be the strongest and most consistent predictor of followup outcomes.

Unfortunately, several questions raise serious doubts about the DARP findings. Simpson and Sells (1983) were aware of many of the limitations

in the design of DARP (see p. 15) and did their best to deal with them. For example, they downplay the importance of their findings based on pretreatment-posttreatment comparisons. Nevertheless, the difficulties encountered by DARP are typical of the obstacles faced by all treatment researchers and serve as a useful illustration.

Question #1: How valid are the outcome data?

Reliance on self-report measures, as is the case in the DARP study, always raises suspicions. Furthermore, the validity of self-reports is especially suspect when respondents must relate events that occurred several years earlier. Most critics of self-reports find that self-reports of both current and past use underestimate drug use (Harrell 1985). However, Aiken (1986) found an instance in which retrospective self-reports were systematically more negative than the original self-reports and suggests that drug users made themselves look worse off than they really were in order to gain access to treatment services. While most reservations about self-reports focus on intentional distortion by respondents, there are other, equally serious sources of bias. Respondents may well have trouble remembering details of events that occurred many months earlier, and the difficulties are compounded if their memories are impaired by drug use. Even when respondents attempt to give accurate answers, their memories may not reflect what actually happened. Without corroborating evidence, there simply is no way to judge the accuracy of self-reports.

Question #2: How well do the outcome data represent all clients?

In DARP, as in most drug abuse treatment studies, it was very difficult to locate clients who had left treatment. Consequently, low response rates, such as the 61 percent reported for DARP, are common. Moreover, there is generally no way to determine whether respondents' reports represent the clients who could not be interviewed. A likely

possibility, of course, is that clients who are better off are located more easily than less well-off clients. Presumably, better-off clients are more likely to be alive, to have a stable working and living situation, and to be listed in telephone directories. Such clients may also be more willing to provide followup data than those who have relapsed. For these reasons, the prudent course is to assume that the outcomes reported by respondents are more positive than those of patients who could not be contacted.

Question #3: How much did treatment contribute to positive outcomes?

Smart (1977) and others have noted that clients probably tend to enter treatment at crisis points in their drug-using career, such as when they "hit bottom." Consequently, they are likely to be better off when tested after treatment simply because chances are good of catching them at some point other than during a major crisis. Simpson and Sells' (1983) findings are consistent with such an explanation. Daily use of opiates among the intake-only group declined by 47 percent from pretreatment to the first-year posttreatment interview even though these individuals were *not* treated in the DARP system. Similarly, Brown et al. (1988) reported large declines in drug use among individuals waiting 1 to 6 months to enter a residential treatment center for cocaine abuse. Thus, the evidence suggests that drug abusers who decide to enter treatment tend to reduce their drug use sometime shortly thereafter, whether or not they actually obtain treatment.

In short, there exists a plausible *alternative explanation* for the reductions in drug use observed among clients of drug abuse treatment. Therefore, it is incumbent upon researchers to demonstrate that changes observed in treated individuals are greater than changes that would have occurred without treatment. Unfortunately, this task is exceedingly difficult. Although the DARP study attempted to demonstrate the superiority of treatment over no treatment by comparing treated individuals with others who

were admitted but not treated, the results of this comparison are merely suggestive. The investigators had no control over who remained in treatment and who did not. Therefore, it is possible that those individuals who remained in treatment were more receptive to reducing their drug use than those who left DARP after admission. Without knowing that the treated and untreated groups were similar before treatment on all important dimensions (such as motivation to reduce drug use), it is difficult to assess the role of treatment in reducing drug use.

Question #4: How important are the undesired effects of treatment?

Numerous investigators have emphasized the importance of examining a broad range of outcomes when judging the effectiveness of drug abuse treatment programs. DARP exemplifies the need to measure clients' use of many substances, even if the treatment program in question is designed to reduce use of only one particular drug. In each DARP treatment group, marijuana and alcohol use increased from pretreatment to posttreatment at the same time use of heroin declined. The percentages of daily marijuana users increased by 35 percent to 120 percent, and the percentages of clients using over 4 oz per day and over 8 oz per day of 80-proof spirits nearly doubled. Large increases in alcohol consumption among treated opiate users have also been observed by other investigators (Cushman 1978; McGlothlin and Anglin 1981). Riordan et al. (1976) are very blunt in stating that "alcohol consumption may present a greater threat to successful rehabilitative outcome than continued use of opiates" (p. 2607).

Question #5: How much treatment did clients receive?

All subject contacts with the DARP system were recorded. However, large percentages of clients in all groups reported that they also obtained drug abuse treatment outside the DARP system. These percentages ranged from 32 percent of the

therapeutic community clients to 43 percent of the intake-only clients who had obtained other drug abuse treatment during the 1-year followup period. Treatment received outside the DARP system seriously confuses interpretation of the results in at least two ways. First, it is impossible to determine the relative impact of DARP and of outside treatment. Second, the intake-only group, which was intended to be a *no treatment* group, turns out to be really another treatment group, given that nearly half the individuals in this group obtained drug abuse treatment. Under these circumstances, comparisons between treatment groups and the intake-only group may actually *underestimate* the effectiveness of treatment.

In sum, DARP was a massive undertaking that produced extensive and important descriptions of the drug abuse treatment system during the early 1970s. DARP also addressed and solved many extraordinarily difficult problems associated with collecting nationwide data on drug abuse treatment. Yet DARP was also handicapped by numerous, serious methodological problems. Unfortunately, some--and often all--of these methodological problems are shared by most drug abuse treatment research.

Alternative Approaches to Increasing Confidence in Drug Abuse Treatment Research Findings

There are at least two strategies for overcoming the methodological shortcomings discussed above. One approach is to rely on randomized clinical trials for drawing conclusions. The other is to use natural experiments and quasi-experimental designs that overcome many of the limitations inherent in most drug abuse treatment research.

Randomized Clinical Trials.

One group of investigators (Wilner et al. 1985) noted the sharply different conclusions reached by various reviewers regarding the efficacy of treatment in the mental health field. To address

this problem, they chose to focus on "high-quality outcome evaluations" because "critics of prior attempts to assess the findings of mental health evaluations have frequently maintained that poorly conceived and implemented interventions evaluated by poorly conceived and implemented research designs could yield little of value" (p. 4). They used a two-step screening process to select high-quality studies. First, studies had to have been published in any of 50 "major journals" that use (the investigators assumed) careful review procedures that would exclude "reports based on dubious premises and operationalizations, faulty statistics, and ineptly designed programs" (p. 4). Second, they chose only those studies that used randomly assigned control groups. Their sample of reports published between 1969 and 1979 produced 16 investigations of drug abuse treatment outcomes that satisfied both selection criteria. The overall results of these 16 studies were summarized as follows: five studies reported "only success," another five reported "no success," and the remaining six reported "partial success."

At least two more recently conducted studies also employed random assignment. Amini et al. (1982), for example, found no difference between inpatient and probation treatments 1 year after entry into treatment. This finding is noteworthy because of the big contrast between the treatments to which 87 teenagers (all of whom had been referred through the juvenile probation department) were randomly assigned. The inpatient treatment, lasting an average of 132 days, consisted of intensive, psychodynamically oriented psychotherapy in a therapeutic milieu; a daily 1-1/2-hour community meeting; family therapy; group therapy; occupational and recreational therapy; psychodrama; and an on-ward school program. Therapists for the program were psychiatric residents or predoctoral fellows in clinical psychology. In addition, some patients received outpatient psychotherapy following their inpatient stay. In contrast, the probation condition consisted of the "usual resources available to the probation department within the community."

Random assignment was also employed by Woody et al. (1983) to test the value of adding professional psychotherapy to traditional drug counseling for male veterans. The issue is a particularly important one because of reports that (1) roughly 85 percent of the methadone patients studied were experiencing a psychiatric disorder or had experienced one in the past (Woody et al. 1988), and (2) patients with severe psychiatric symptoms tend not to improve in treatment (McLellan et al. 1983). Although the addition of professional psychotherapy produced significantly better outcomes at both 7- and 12-month followups than did drug counseling alone, a subsequent replication found weaker and more variable effects than were found in the original study (Woody et al. 1988).

There are, of course, good reasons for the absence of randomized clinical trials in the drug abuse treatment field. Such studies are very expensive and difficult. Kleber (1983) goes so far as to state: "Thus, although random assignment may be theoretically ideal, in practice, at least in the drug treatment field, it is so uncommon that it is impractical to waste time bemoaning its absence" (p. 532). A study by Bale et al. (1980) illustrates some of the problems that can arise when a random comparison of drug abuse treatments is attempted. Following a brief detoxification for their heroin addiction, 585 male veterans were randomly assigned to either a methadone maintenance program or one of three therapeutic community programs. Unfortunately, fewer than 20 percent of the subjects accepted their assignment and spent at least 1 week in treatment.

Natural Experiments and Quasi-Experimental Designs.

Natural experiments, which use naturally occurring events as the "experimental manipulation" in a study, are one of the approaches that allow investigators to determine whether the results of treatment are due to self-selection by clients. For example, several studies have taken advantage of the termination of methadone programs to examine

how the involuntary cessation of treatment affects clients. In one such study (McGlothlin and Anglin 1981), individuals were interviewed 2 years after their methadone maintenance program closed. These involuntarily discharged individuals were much more likely to be readdicted to heroin and to have been incarcerated than a matched sample of individuals from another program that did not close. Apparently, the methadone program was effective as long as clients remained in treatment, but its impact was short-lived. Anglin et al. (1989) studied the effect of closing a public methadone clinic in a different city and found similar outcomes. Clients were interviewed an average of 27 months after the clinic closed and asked about their drug use and related behaviors. During the period from the program closing to the interview, the status or behavior of discharged clients who were unable or unwilling to transfer into private treatment programs was significantly worse than that of discharged clients who transferred.

A very different type of natural experiment by McLellan et al. (1983) investigated the benefits of matching male veterans who applied for substance abuse rehabilitation treatment to the program most appropriate for them. Although the investigators planned to assign all their clients to what they hypothesized would be the best of several alternative treatments, some patients were inadvertently not assigned. But because failure to assign a client according to plan appeared to be a random occurrence, the investigators were able to conclude with a high level of confidence that matched patients performed better during treatment and had superior 6-month outcomes than patients who were not matched.

Recently, several new methodologies have been introduced by researchers in an effort to overcome some of the obstacles that plague conventional drug abuse treatment research. For example, Hser et al. (1988) attempted to deal with two important weaknesses common to most research on drug abuse treatment outcomes. One is that most treatment research tries to measure the impact of a single treatment episode even though it is well known that drug users typically enter multiple treatment programs for varying amounts of time

during their treatment history. The other is that treatment outcome research typically relies on a measure of pretreatment behavior targeted at the time immediately before clients enter treatment. As discussed above, this pretreatment period is probably one during which clients "hit bottom" in their drug-using careers; consequently, posttreatment measurements will likely show improvement with or without treatment.

To counter these two problems, Hser et al. (1988) interviewed their subjects to obtain detailed, retrospective histories that began at the point of first narcotic use and continued until the time of the interview. Next, they grouped together all time periods not spent in treatment and, separately, all time periods not spent in treatment that occurred following the initial treatment. Comparisons were then made among clients classified by the *total* amount of time they had spent in treatment. The authors conclude: "Important findings of the present study are that, regardless of ethnicity and sex or the amount of treatment participation, there are significant improvements while addicts are in treatment. During periods when addicts are discharged from treatment, some sustained improvement is still observable, although to a lesser degree when compared to concurrent treatment effects" (p. 567).

Using another innovative technique, Fisher and Anglin (1987) and Anglin and Fisher (1987) applied survival analysis to the evaluation of drug abuse treatment. Ordinarily, treatment effectiveness is determined by comparing pretreatment behavior with behavior measured at the time of a followup interview. Survival analysis, however, attempts to describe the probability of treated individuals avoiding undesired outcomes throughout the followup period. Despite some important limitations of the technique in its present form, survival analysis holds promise of becoming an important tool for drug treatment researchers.

Cost-Effectiveness Analyses of Drug Abuse Treatment

One of the most important findings from the literature search is that cost-effectiveness studies of drug abuse treatment are rare. Other investigators have reached the same conclusion (Cross et al. 1988; Hubbard et al. 1989). This section describes one cost-effectiveness analysis of a single program and one such analysis of a large number of drug abuse treatment programs across the country. Because of the dearth of cost-effectiveness analyses, assorted studies from both the drug and the alcohol fields are briefly reviewed so as to generate some tentative conclusions about the cost-effectiveness of drug abuse treatment.

Cost-Effectiveness Analysis of a Single Program.

Reports of the cost-effectiveness of individual drug abuse treatment programs are almost nonexistent. An exception is a study mentioned earlier of the effects of closing a methadone maintenance program (McGlothlin and Anglin 1981). This study illustrates some of the complex and unexpected relationships that can emerge in an investigation of the cost-effectiveness of drug abuse treatment. One portion of McGlothlin and Anglin's study compared the "social costs" incurred in the community where the program was closed with those costs in a comparison community containing a drug program that did not close. Costs were calculated only for the period from the closing to the time of the interview (an average of 26 months). Rough estimates were obtained for the costs of treatment, arrest and court processing, jail, probation, forgery, robbery, and welfare. The overall results showed that for males, mean annual costs per subject in the community with the closed program were approximately 17 percent higher than those in the comparison community (\$6,204 vs. \$5,323, respectively). However, for females, the mean annual costs were much lower (58 percent) in the community where the program closed than they were in the control community (\$3,691 vs. \$6,306, respectively).

Treatment costs were obviously much higher in the comparison community because only a small number of the involuntarily discharged clients obtained substitute treatment following the closing of their program. However, while males in the community with the closed program were responsible for substantially greater criminal activity costs than males in the comparison community, the picture was more complex for females. Like the males, females in the community with the closed program incurred much higher criminal justice system costs than comparison subjects. But the relationship reversed for costs of self-reported property crime, which were three times higher in the comparison community. In addition, welfare costs were two and a half times higher for comparison females.

Finally, an important discovery by McGlothlin and Anglin (1981) adds to the complexities of judging the cost-effectiveness of methadone maintenance programs. They found that 27 percent of involuntarily discharged respondents felt they had benefited from the closing because it enabled them to discontinue methadone as well as heroin. Furthermore, only 26 percent of the respondents indicated that they would enroll in methadone maintenance if it became available again. In McGlothlin and Anglin's words, this finding "raises the question of the extent to which methadone programs may be unnecessarily prolonging the addiction to a narcotic--albeit one licitly obtained" (p. 891).

Cost-Effectiveness Analysis of Multiple Programs.

Hubbard et al. (1989) analyzed the costs and crime-reducing effects of 41 drug abuse programs as part of the Treatment Outcome Prospective Study (TOPS), the successor to DARP. Eleven thousand individuals who entered the 41 selected drug abuse treatment programs across the Nation between 1979 and 1981 were interviewed upon admission to (1) outpatient methadone maintenance, (2) therapeutic community, or (3) outpatient drug-free programs (no control group was used). Three annual admission cohorts were

interviewed at 3-month intervals during treatment, and samples of each cohort were interviewed at 3 months, 1 year, 2 years, and 3 to 5 years after leaving treatment. The authors conclude that "treatment results in substantial decreases in the abuse of both opioid and nonopioid drugs but that the goal of abstinence is achieved for relatively few" (p. 124). In addition, "substantial declines were observed for criminal activity and suicidal symptoms, while heavy alcohol use was stable in the years after treatment" (p. 150).

Hubbard et al. (1989) also conducted a cost-effectiveness analysis that estimated the economic benefits of TOPS drug abuse treatment in terms of crime reduction. The average daily cost of drug abuse treatment was \$18.50 in residential facilities and only \$6 in outpatient methadone or outpatient drug-free programs. The crime-related costs of drug abuse were divided into four categories. The first category, costs to victims, included medical expenses, property damage, and employment-related costs. Average costs were based on the 1979 National Victimization Survey conducted by the U.S. Department of Justice. The second category, costs for criminal justice, included expenditures for police services, adjudication, and incarceration. These costs were estimated from information about government expenditures provided by the U.S. Department of Justice. Crime career/productivity costs included losses that occur when drug abusers are removed from the "productive economy." These were estimated for each drug abuser by calculating the difference between the person's self-reported legitimate earnings and the national average for persons of the same age and sex. Lastly, losses from theft were estimated from the National Victimization Survey. Hubbard et al. found as follows:

Overall, the costs of drug abuse to law-abiding citizens fell from \$9,190 per drug abuser in the year before treatment to \$7,379 per addict in the year after treatment, a decrease of about 20 percent. Comparable costs to society declined from \$15,262 to \$14,089, a decrease of about 8 percent. Costs to victims declined by

about 30 percent, criminal justice costs by about 24 percent, and the costs of theft by about 11 percent. Partially offsetting these decreases was a slight increase in crime career/productivity losses and little improvement in legal earnings. Note, however, the substantial decreases in illegal income, from \$6,937 in the year before treatment to \$2,546 in the year after treatment, and also the close correspondence between drug expenditures and illegal income in both periods (pp. 156-157).

They conclude that the substantial reduction they found in crime-related and other costs to the Nation caused by drug abusers "appears to be at least as large as the cost of providing treatment and much of the expenditure is recovered during the time the drug abuser is in treatment" (p. 161).

Hubbard et al. (1989) also report that the choice of timeframe is crucial in judging the cost-effectiveness of drug abuse treatment. They state that "although clients decreased their criminal activity immediately after treatment, they did little to improve their integration into the legitimate economy" (p. 156). Without that integration, one must anticipate the possibility that some clients would again increase their involvement in criminal activities. That, in fact, appears to have happened. In regard to crime-related costs of drug abuse, the authors found that "by three to five years after treatment there was a return to pretreatment levels of costs" (p. 156).

Unfortunately, TOPS suffers from the same design limitations that were described in detail above for DARP. In addition, some of the ancillary findings challenge the validity of the primary outcome measure--use of opiates. Comparisons of self-reports and clinical/medical records showed that "the prevalence of heroin was understated in the self-report data and results of urinalysis revealed a tendency to underreport use of all drugs in the clinical setting..." (p. 32). While Hubbard et al. (1989) dismiss these findings as having no relative influence on the overall results, the reader is left wondering how they can be so sure and

what they might have found had the validity of other outcome measures, such as criminality, been examined. In addition, the measurement of costs in the TOPS cost-effectiveness analysis was primitive. For example, no attempt was made to measure actual costs resulting from crimes committed by TOPS subjects.

The claims made for the effectiveness of drug abuse treatment that are based on TOPS may prove to be correct. For now, however, they must be considered quite tentative.

Cost-Effectiveness Implications From Other Drug Research.

Other research has obvious implications for the provision of cost-effective drug abuse treatment although cost-effectiveness is not the major focus of these studies. For instance, Des Jarlais et al. (1985) contend that methadone can be provided to well-rehabilitated methadone maintenance clients in much the same way chemotherapy is provided for other chronic illnesses, resulting in cost savings from a reduced need for supportive services. However, Des Jarlais et al. do not indicate the expected magnitude of the cost savings. In fact, their discussion focuses on the direct benefits to clients and does not mention cost savings.

More recently, Ball et al. (1988) studied the impact of methadone programs in three cities on rates of IV drug use. They found that 71 percent of the patients who remained in treatment for 1 year or more ceased using drugs intravenously, whereas 82 percent of the patients who left treatment quickly renewed their IV drug use. Another important finding was that program effectiveness in reducing IV drug use varied substantially and was apparently related to the quality of treatment. The possibility that drug abuse treatment can reduce the risk of acquired immune deficiency syndrome (AIDS) will certainly be a major consideration in future assessments of cost-effectiveness.

Cost-Effectiveness Implications From Alcoholism Research.

Another source of evidence that may have implications for the cost-effectiveness of drug abuse treatment is the large body of research on a closely related problem--alcoholism. One remarkably consistent finding is that there appears to be no convincing evidence that any alcoholism treatment modality is superior to another, including inpatient versus outpatient treatment. For instance, Longabaugh and Lewis (1988) state as follows:

The general perception of the research community, arising from the findings of considerable treatment outcome research, is that alcoholism treatment has demonstrated but limited efficacy. Comparisons of treatment modalities suggest that few are consistently found to be superior to alternative modalities and that the observed differences are transitory. The positive outcomes of treated patients, while significant, only modestly surpass the outcomes of those who are not treated.

Similarly, after reviewing 26 controlled-treatment comparisons, Miller and Hester (1986) conclude that the studies "have consistently shown no overall advantage for residential over nonresidential settings, for longer over shorter inpatient programs, or for more intensive over less intensive interventions in treating alcohol abuse" (p. 794). The authors then pursue the implications of their findings for the costs of treatment. They contend that routine inpatient alcoholism treatment typically costs between \$4,000 and \$15,000, whereas optimal outpatient treatment averages 90 percent less, even if delivered by fully credentialed professionals at prevailing private practice rates.

The same conclusion was reached more recently by Hayashida et al. (1989). They conducted a randomized prospective comparison of inpatient versus outpatient detoxification of low-socioeconomic-status patients with mild to

moderate alcohol withdrawal syndrome. They found no group differences in their outcome measures at 6-months after treatment and no differences in the subsequent use of other alcoholism treatment services. The costs for inpatient treatment ranged from \$3,319 to \$3,665 per patient; the cost for outpatients ranged from \$175 to \$388.

The Hayashida et al. (1989) study is particularly important for the analysis of treatment cost issues because of the type of clients involved. One could plausibly assume that inpatient treatment is necessary for most clients who have few social supports. However, even though none of Hayashida et al.'s clients was accompanied by a family member or a close friend and some did not have a stable residence, they appeared to do as well in outpatient treatment as in inpatient treatment.

Potential Areas for Improving Cost-Effectiveness.

There are two areas in which the cost-effectiveness of drug abuse treatment could likely be substantially improved: the provision of aftercare and the matching of clients to treatment. However, neither area has received much study.

Although it seems logical to assume that aftercare would produce better outcomes than treatment alone, evidence about its benefits is unclear. On the one hand, Armor et al. (1978) found no benefits of aftercare when they followed individuals who had received treatment for alcoholism. On the other hand, McAuliffe et al. (1985) randomly assigned successfully treated opiate addicts at multiple sites to either "usual care" or an aftercare program; 12 months later, the aftercare group had more subjects with good outcomes than the control group. But as Hawkins and Catalano (1985) point out, the value of aftercare is clouded by the fact that attendance and attrition are severe problems for aftercare researchers. For instance, only a quarter of McAuliffe et al.'s aftercare subjects remained active in self-help groups for 6 months or more. Despite these mixed research reports, better

understanding of both the need for aftercare and the types of aftercare that offer the most effective assistance seems essential for improving the long-term cost-effectiveness of drug abuse treatment.

Patient matching is a strategy with great potential for improving the effectiveness of treatment. While most drug abuse treatment research has ignored individual differences, it is well known that drug addicts are actually a very heterogeneous group. In a major study mentioned earlier, McLellan et al. (1983) investigated the benefits of matching male veterans who applied for substance abuse rehabilitation treatment to the program most appropriate for them. Matched patients performed better during treatment and had superior 6-month outcomes than did patients who were inadvertently not matched.

Despite the obvious appeal of matching clients to treatment, a great deal of research will be necessary before this technique can be applied effectively. For example, in referring to the alcoholism treatment literature, Finney and Moos (1986) state, "The current enthusiasm for matching patients with optimal treatments rests on limited conceptual analyses. In addition, much of the existing research on patient-treatment matching has been based on methodological assumptions that are not commensurate with the complexity of the matching problem" (p. 555). Jaffe (1984) makes a similar point: "We recognize that the relationships we have found to date between patient characteristics and outcome, while reliable, often account for only a small part of the variance, and that in any given case it is still not certain just what treatment, if any, would produce the best outcome for a given patient" (p. 15).

Conclusions

Because of both the scarcity of well-designed research on treatment effectiveness and the near absence of cost-effectiveness analyses, it is impossible to do more than speculate about the cost-effectiveness of drug abuse treatment. For example, research has not yet demonstrated the

superiority of any one treatment modality over others, except to say that detoxification alone seems less useful than the other treatment modalities. Therefore, the most prudent course at this point is to assume that, in general, the least expensive treatment modalities are the most cost-effective. Similarly, evidence does not show that inpatient treatment is more effective than outpatient treatment. Thus, although unique situations will, of course, require inpatient treatment, widespread use of it is not warranted at this time. This conclusion obviously has profound implications. For a given amount of treatment dollars, far more drug abusers can be treated through outpatient programs than through much more expensive inpatient programs.

It is also possible to draw some tentative conclusions about the relationship between the cost-effectiveness of treatment and the time when the impact of treatment is measured. Even strong supporters of the efficacy of drug abuse treatment, such as Anglin and Hser (1990), clearly state that the effects of treatment dissipate quickly after clients leave treatment. Therefore, drug abuse treatment may be cost-effective but *only for clients who remain in treatment*. Conversely, drug abuse treatment appears *not* to be cost-effective if it is judged by its long-term impact on drug users who have left treatment. A corollary to this conclusion is that treatment programs with high turnover rates should prove to be less cost-effective than programs in which clients remain for long periods. However, the key question of the value of cumulative time in treatment remains unanswered. Even short treatment stays could prove cost-effective if their impact is cumulative.

One of the most difficult questions is whether drug abuse treatment is cost-effective in comparison with no treatment at all. The treatment outcome literature suggests two responses. First, relatively recent research is beginning to address some of the serious methodological deficits in most outcome research. For example, findings from studies of involuntary treatment are countering the challenge that positive results in some studies, such as DARP, are due to self-selection of clients. Thus,

the next few years may see the evolution of a much stronger research base from which to judge the cost-effectiveness of drug abuse treatment.

The other response to the question "Is treatment effective?" is that attempts at an overall assessment may not be very useful. Arguments against the value of treatment rest largely on findings that some drug abusers improve on their own. However, drug abusers who improve on their own may be quite different types of individuals from those who improve in treatment. Furthermore, there is some evidence that drug abusers who enter treatment are worse off than those who do not and, therefore, are more difficult to help. A far more useful question is, "Under what circumstances are specific types of treatment effective with specific types of drug abusers?"

This line of reasoning leads to the possibility that drug abuse treatment could prove extremely cost-effective in specific circumstances. For example, if the increasing efforts to treat pregnant drug abusers markedly improve the health of their babies, the result could translate into huge cost savings in providing health care throughout their children's lives. Similarly, small drug abuse treatment successes in terms of reducing the spread of AIDS can produce great cost savings.

Finally, investigators have identified several areas in which future research is likely to produce increases in the cost-effectiveness of drug abuse treatment. These include readiness for treatment, matching of drug abusers and treatments, intensity and scope of treatment, type of treatment, duration of treatment, and relapse prevention.

PART II: RECOMMENDATIONS FOR STUDYING THE COST-EFFECTIVENESS OF DRUG ABUSE TREATMENT

Only a few of the necessary ingredients currently exist for conducting cost-effectiveness analyses of drug abuse treatment. The elements, which were presented in the introduction, are (1) *define the*

problem, (2) identify and define the interventions proposed for dealing with the problem, (3) identify the costs of each of the interventions, (4) identify the outcomes of the interventions, and (5) calculate cost-effectiveness of each program and compare interventions. Part II of this paper examines each of those elements and the steps that must be taken for cost-effectiveness analyses to be conducted on drug abuse treatment.

Define the Problem

To study whether drug abuse treatment is cost-effective, it first is necessary to specify the problem with which drug abuse treatment deals and ask, "What is drug abuse?" While this question is an obvious and logical place to start, there is no simple answer. The complexities of defining drug abuse have been apparent for years (Apsler 1978; Zinberg et al. 1978), yet there has been little progress in resolving them. For example, the simplest solution, that of equating drug abuse with use of illicit drugs, is also one of the least satisfactory. It leads to the inconsistency of labeling as "drug abusers" people who occasionally smoke small amounts of marijuana while heavy users of licit substances, such as alcohol and tobacco, are not regarded as drug abusers. Another complication is the need to distinguish between harmful effects caused by the chemical properties of an illicit drug and criminal actions taken by addicts in their efforts to obtain the drug. The latter are largely a consequence of the high black-market prices of illicit drugs, which, for the most part result from their illegal status. Even some of the fundamental concepts in the field, such as "addiction" and "psychological dependence," lack clear and widely accepted definitions (Apsler 1978).

One reason for the lack of agreement concerning the definition of drug abuse is that markedly different explanatory models of drug addiction have evolved. Anglin and Hser (1990) identify four categories of addiction models that frequently appear in the literature.

The disease model of addiction holds that chemical dependence is a primary illness based on a biogenetic predisposition. As with diabetes or schizophrenia, the patient is not considered responsible for developing or having the illness. The self-medication hypothesis of addiction views addiction as secondary to another psychiatric illness such as depression, attention deficit disorder, or schizophrenia which the patient may be trying to treat by use of drugs (Khantzian et al. 1984). The behavioral model views addiction as a pattern of maladaptive, learned habits which are modifiable by cognitive-behavioral techniques (Marlatt and Gordon 1985). A fourth model of addiction, the moral model, views the cause of drug abuse as due to moral weakness. Such persons are seen to be directly responsible for their addiction due to their willful participation in illicit drug use (pp. 13-14).

The absence of consensus about a definition of drug abuse, combined with the existence of radically different explanations for its causes, has led to widespread disagreements and confusion in the field concerning the goals of drug abuse treatment. For instance, disagreement about how much, if any, use of illicit drugs is acceptable is manifested in contradictory conclusions about the success of methadone maintenance programs. On the one hand, Anglin and Hser (1990) hail the success of these programs, pointing to evidence that they diminish illicit narcotic use and criminal activity among those who are in treatment. On the other hand, the General Accounting Office (GAO) visited 15 methadone programs in five States and found that (1) the use of heroin and other opiates ranged from 2 to 47 percent of patients enrolled in the clinics, (2) many patients had serious alcohol problems, (3) few comprehensive services were offered to patients despite high rates of unemployment, and (4) clinics did not know if patients used the services to which they were referred. According to this GAO report, these findings "indicate that most clinics have not been

able to deal effectively with the drug problems of many of their patients" (Shikles 1989).

Similarly, lack of consensus about treatment goals also contributes to the difficulty in judging the success of therapeutic communities. Smart (1976) observes that only 10 to 15 percent of clients complete treatment. These low percentages raise the general questions of (1) how many clients should be expected to complete a treatment regimen, and (2) what portion of those completing treatment must have good outcomes for a program to be considered successful. Smart then notes that more than half the graduates secure employment with another addiction community or treatment agency. This source of employment raises the question of whether "successful" treatment programs should be required to reintegrate drug users into the world outside drug abuse treatment agencies.

A closely related area of confusion across the entire drug field involves deciding which drugs should be targeted by drug abuse treatment facilities. Some investigators have commented on the limitations of facilities that target use of a single drug (Hubbard et al. 1989). First, such facilities are not well suited to the large number of individuals who are polydrug abusers. Second, they are not effective in dealing with changes in the public's preferences for drugs. For example, the large network of programs developed for adult male heroin addicts may not be appropriate in today's climate, in which use of cocaine and crack have increased and broad age ranges of both sexes seek treatment.

Defining "drug abuse" is also necessary to deal with the question of what else besides drug use should be targeted by treatment programs. Agreement now seems to be widespread that such programs should consider a variety of client problems that may be related to drug abuse, as well as the drug use itself. For example, Emrick and Hansen's (1983) work suggests that other problems in addition to drinking must be considered when dealing with alcoholics. They cite several investigators who argue that other

aspects of an individual's overall functioning are often much more important than drinking behavior in judging the success of treatment and rehabilitation for alcoholism. This same concern can be applied to drug abuse treatment. While reducing drug use is a logical and laudable treatment goal, it may be equally important to address related problems, such as the client's psychopathology, underemployment, or criminal behavior.

Finally, the factor of time-in-treatment, or retention, underscores the need for the drug abuse field to reach agreement about a definition of drug abuse and the goals of treatment. Anglin and Hser (1990) report that the longer clients stay in treatment, the better their status at followup. For this reason, and because programs can only influence clients who participate in treatment, retention is often discussed as a primary goal of treatment. However, this goal immediately raises a related question that is rarely addressed: How long should clients remain in treatment? The response to this question obviously has major implications for conducting cost-effectiveness analyses of drug abuse treatment.

One answer is that drug abusers should remain in treatment indefinitely. This answer follows from two of the explanatory models of drug addiction described above and also from treatment followup research. Both the disease model and the self-medication hypothesis of drug addiction suggest that drug abusers should remain in treatment until some future time when a cure to the underlying problem is discovered. In addition, the consistent finding that the effects of drug abuse treatment quickly dissipate after clients leave treatment argues for retaining clients indefinitely.

If programs become increasingly successful in keeping clients in treatment, an ever larger number of programs will be necessary. Existing program slots will fill up with "old" drug abusers so that additional programs will be needed to handle "new" drug abusers. Richman (1983) claims that this problem of programs becoming less accessible to new patients is already a serious one.

Other evidence, however, indicates that at least some clients are kept in treatment too long. As described in Part I, McGlothlin and Anglin (1981) found that methadone maintenance programs may unnecessarily prolong the addiction careers of some clients. Other investigators have observed that some drug addicts cease or markedly reduce their drug use on their own (Wineck 1962; Anglin et al. 1986). Obviously, providing methadone maintenance treatment longer than necessary is cost-*ineffective* and counterproductive.

Given the current ambiguities and differences in point of view about the definition of drug abuse and the goals of treatment, it is incumbent on investigators undertaking a cost-effectiveness analysis to specify a working definition of drug abuse and the treatment goals that will guide their analysis. Without them, there will be no framework for organizing data obtained on multiple outcome measures, and judging overall treatment effectiveness and comparisons among studies will be difficult, if not, impossible.

Identify and Define the Interventions Proposed for Dealing With the Problem

According to Anglin and Hser (1990), four drug abuse treatment modalities account for roughly 90 percent of all clients in treatment. These pervasive modalities are (1) outpatient methadone maintenance for narcotics addicts, (2) detoxification, (3) therapeutic community, and (4) outpatient drug-free programs. There are, however, substantial differences among programs within each of these broad categories. For example, Hubbard et al. (1989) discuss variations within methadone maintenance programs, therapeutic communities, and outpatient drug-free programs. Saxe and Shusterman in this volume go so far as to argue that the traditional classes of treatment modality are not very useful; they propose an alternative taxonomy consisting of two dimensions: treatment model and treatment setting. However, their two-dimensional taxonomy does not include several factors that may be critical in the treatment process, such as dosage levels of methadone or other drugs, strictness in

enforcing adherence to program rules, the means by which treatment is financed, the existence and features of aftercare, the integration of therapists with other treatment staff, staff motivation, staff training in drug abuse treatment, and the extent and quality of staff supervision.

Extensive variation among drug abuse treatment programs poses considerable difficulties for conducting a cost-effectiveness analysis. One major problem is the impossibility of generalizing from the results of individual treatment outcome studies to other treatment programs. Thus, to draw conclusions about the costs and outcomes of a particular treatment modality, a sample of programs employing that modality should be considered. Doing so will ensure that the information gathered represents the modality rather than a unique treatment program that happens to incorporate some features of the modality.

Another difficulty that arises is the problem of identifying all the elements that comprise a program so as to learn which components are responsible for program success, which have no impact, and which are counterproductive. To improve cost-effectiveness, it is critical to identify and discard components of a program that have little to do with its success or that reduce rather than enhance its impact.

Finally, there is the question of how well program components are implemented and how the implementation of them may vary over time. In drug abuse treatment, as in many other fields, it is common to find substantial disparities between the way a program is described and the way it actually operates. An accurate cost-effectiveness analysis depends on learning how the program actually functions.

Identify the Costs of Each of the Interventions

As Peterson (1986) cautions, (1) costs must be calculated in the same way by all programs being compared, (2) careful records of costs must be maintained by each program, and (3) adjustments for inflation and location may be required. Unfortunately, there is at present no uniformity in

cost reporting among drug abuse treatment facilities.

Yates (1985) describes alternative perspectives from which costs can be assessed and warns that the different perspectives can sometimes produce conflicting cost findings. The "operations" perspective defines personnel, facilities, equipment, and materials costs as the expenditures listed in accounting ledgers. The "societal" perspective attempts to measure more comprehensively the value of all resources used in delivering services by determining their opportunity cost. Finally, the "client" perspective includes money and time spent by clients as well as any psychological costs. This element of cost-effectiveness analysis, unlike the others, is relatively straightforward. Since the technical details can be obtained from cost-effectiveness analyses conducted in a variety of related health care fields, they will not be described here.

Identify the Outcomes of the Interventions

What Should Be Measured?

The primary outcome reported in drug abuse treatment research is that of reduced drug use. However, a number of investigators have discussed the importance of measuring other outcomes. For instance, Goldstein et al. (1984) advocate including emotional, vocational, physical, interpersonal, and social outcome measures, as well as measures of the primary and long-term goal of eliminating substance use. Emrick and Hansen (1983) note that a nearly endless variety of potential treatment outcomes exists and suggest the following as a core set to be used for all treatment evaluation studies: (1) treatment completion, (2) relapse, (3) mortality, (4) treatment use, (5) physical health, (6) substance use, (7) legal problems, (8) vocational functioning, (9) family/social functioning, (10) emotional functioning, and (11) life stressors. Referring to methadone maintenance treatment, Hall (1983) states that seven categories of outcome are important: (1) drug abuse, (2) illegal activities, (3) employment, (4) program

retention, (5) social functioning, (6) intrapersonal functioning, and (7) physical health and longevity.

What Time Span Should Be Used?

Hser et al. (1988) make a convincing case for measuring outcomes over a long period of time. The measurement period should begin long before the first treatment episode, and ideally measurements should cover subjects' entire drug-using and treatment careers.

As explained earlier, measurement of a long pretreatment period is desirable to show that apparent treatment success is not an artifact of clients entering treatment at low points in their drug-using careers. By measuring a long pretreatment period, investigators can examine the full range of changes in outcome measures that occur in the absence of treatment. Then, the magnitude and endurance of changes that occur following entrance into a treatment program can be accurately gauged.

It was also mentioned earlier that drug users typically have multiple treatment episodes. As a consequence, it is very difficult to study the cost-effectiveness of a single treatment episode. For instance, many clients may leave the program being studied and enter other programs before a long-term followup can be conducted. Once clients have participated in more than one treatment program, separating out the effects of each program becomes a formidable and challenging task.

The need to study drug users over long periods of time dictates the use of retrospective studies. While prospective studies are preferable, the great expense and lengthy time periods required mean that, at best, only a few will be conducted. However, it is important that retrospective studies not become totally dependent on subjects' self-reports. Numerous records from multiple sources can be obtained to produce histories for subjects to complement self-reports. Records may be available concerning criminal behavior, medical

treatment, past drug treatments, employment, education, and so on. The use of these records and other methods for corroborating self-reported data is discussed further in the next section.

How Should the Outcomes Be Measured?

The need for an objective measurement of treatment outcomes is one of the most difficult obstacles faced by drug abuse researchers. At present, self-reports, and especially retrospective self-reports, are the primary measurement technique in treatment outcome research and will continue to be so in the foreseeable future because alternatives are much more costly. However, this does not mean that it is acceptable to continue to rely so heavily on self-reported data. In the absence of objective measures, the conclusions of cost-effectiveness analyses will be highly suspect.

How, then, can self-reported data be verified? The most frequently used approach is probably chemical testing to detect recent drug use: urinalysis in methadone maintenance clinics and various tests to detect alcohol use in alcohol treatment are common examples. As mentioned above, criminal justice records can be part of a measure of criminal activity. And because many crimes are never brought into the criminal justice system, other sources of information can be added. For example, investigators can interview individuals who know a subject and may be able to provide either direct information about criminal activity or indirect information about the subject's legitimate sources of income and apparent level of affluence. Participant observers can be another invaluable source of information about a subject's behavior. Employment, medical, and school records can provide objective information, and a subject's current physical health can be assessed through a physical examination. Finally, self-reported emotional well-being can be corroborated by reports from others who know the subject well and by the use of standardized instruments.

Rigorous research is needed to investigate the validity of self-reports. Issues to be explored

include how validity may be affected by the type of subject (e.g., ethnicity, drug preference), by provisions made for confidentiality and the respondent's faith in these provisions, and by the manner in which data are collected (e.g., written questionnaires versus face-to-face interviews). Ideally, longitudinal research should be conducted to test the accuracy of long-term recall. Such research might begin by identifying young individuals likely to become drug users who will eventually enter treatment. From these subjects, two representative samples could be drawn. One sample would be tested repeatedly with objective measures, such as urinalysis, over a period of many years; the other sample would not be tested until the end of the study in order to control for testing effects. (For instance, a testing effect could occur if retrospective self-reports are accurate only because the subjects know the investigators can verify their reports against objective measures.) Finally, after many subjects have had extensive drug-using and treatment careers, subjects in both conditions would be administered retrospective self-reports covering the entire period of the study. If these reports provide accurate data, then the reports of subjects who were repeatedly tested should correspond with the objective measures taken over the years. In addition, there should be no significant differences between self-reports of subjects who were repeatedly tested and self-reports of those who were tested only at the end of the study. However, despite the value of such a prospective study, its cost greatly limits the chances of its ever being conducted.

What Research Designs Should Be Employed?

Without rigorous research designs and methods, drug abuse treatment will remain susceptible to serious challenges. One such challenge comes from continuing reports that at least some drug abusers may be just as likely to improve on their own as they are with the assistance of treatment. Wineck (1962) was the first to observe this "natural recovery" phenomenon with narcotics addicts. Very recently, Cohen et al. (1989) reported the results of a major study showing that

smokers who try quitting on their own have roughly the same rates of success as smokers who attend treatment programs. This report is particularly significant because it is based on the participation of more than 5,000 subjects in 10 long-term prospective studies.

Randomized clinical trials.

The randomized clinical trial has become the widely accepted standard within the scientific community for assessing the value of all manner of treatment interventions. As Fuller (1988) points out in his assessment of the alcoholism treatment literature, "Today, very few people would accept the claims made for a drug treatment if that drug had not been evaluated by a randomized clinical trial. Repeated studies, experience, and time have demonstrated the necessity of using the randomized clinical trial design for valid assessment of treatment" (p. 182). However, as Senay (1983) observed, it is extraordinarily difficult to conduct such studies of drug abuse treatment.

There appear to be two primary objections to conducting randomized clinical trials. One is that alternative treatments differ too greatly, thereby placing some subjects in the position of receiving the less desirable of two alternatives. Kleber (1983) observed that random trials often fail when attempts are made to assign subjects to an unwanted treatment--usually a therapeutic community. There are at least two solutions. The first is to compare treatments that are not radically different. This approach was used successfully by Woody et al. (1983) in the randomized comparison (discussed above) of counseling alone versus psychotherapy added to counseling. The other solution, that of random assignment to either treatment or a waiting list, often raises the other major objection to randomized clinical trials: that it is unethical to withhold treatment from subjects assigned to a no-treatment condition. However, this objection does not seem to apply under current circumstances, given that treatment is already being withheld from drug users for lengthy periods because of a lack of treatment slots.

But even randomized clinical trials are no panacea, for they also have limitations, two of which have already been mentioned: they tend to be expensive, and in some circumstances--such as when subjects refuse the treatment or control group to which they are assigned--they are impossible to conduct. In fact, simply finding sufficient numbers of drug abusers to participate in a randomized clinical trial can be a major difficulty in conducting treatment research. Another important limitation is that random assignment may introduce into the situation "unnatural" factors that reduce the generalizability of the results. For instance, in some circumstances, subjects must be informed in advance about their participation in a research study and made aware of the random assignment aspect. Finally, some questions are not amenable to study with randomized experiments; for example, questions about which sorts of treatment attract which types of drug abusers require other kinds of methodologies.

Even when random assignment is an appropriate tool, practical problems can reduce its utility. For instance, investigators typically have little influence over subjects in no-treatment conditions, such as drug abusers on a waiting list for a particular program. As the DARP study discovered, many no-treatment subjects may actually obtain treatment outside the program being studied. When this happens in a randomized clinical trial, the power of the design is severely compromised.

Clinician reports.

Reports by clinicians are another prominent source of information about the effectiveness of drug abuse treatment. Clinicians appear to be an ideal source of such information because of their intimate knowledge about treatment and their familiarity with clients. However, clinicians' reports have proven to be unsuitable as an alternative to randomized clinical trials. While clinicians may feel strongly about the value of their programs, Armor et al. (1978) state that "there are good reasons why clinical experience

can yield impressions quite different from those of controlled follow-up studies. The main problem has to do with sample bias inherent in clinical practice" (p. 155). Armor et al. explain that most of the clients seen by clinicians on repeat visits are either chronic cases who return upon relapse or successful cases who maintain contact with the program because of pride in their accomplishment. "Thus the clinician may get the impression that alcoholics are either abstaining or in relapse, but this may be based on a very small proportion of the clients actually treated" (p. 155). The validity of clinical impressions has also been questioned by some studies. For example, Rounsaville and Kleber (1985) write, "It appears that the subjective sense of clinicians that methadone maintenance and therapeutic communities are far superior to OPDF [outpatient drug-free treatment] cannot be substantiated by follow-up data" (p. 878).

Other obstacles to obtaining valid measurements of treatment.

There are several other common obstacles that interfere with efforts to obtain accurate measures of treatment effects, but solutions exist for dealing with most of them. For example, many clients drop out of treatment, thereby playing havoc with investigators' efforts to create research designs that neatly divide drug users into treatment and nontreatment groups. However, dropout can be substantially reduced by carefully addressing clients' needs. Woody et al. (1988) employed several strategies that produced high patient compliance in their treatment program without the need for coercion or monetary incentives. For example, they hired therapists who seemed truly interested in treating drug addicts and who felt comfortable with them.

Another serious obstacle is that many drug users have multiple treatment episodes (Kleber 1983; Jaffe 1984). Some writers argue that this phenomenon distorts treatment outcome findings, which typically view each admission as a separate entity when, in fact, many admissions are really readmissions. One solution to this problem is for treatment programs to make much greater efforts

to keep clients in treatment (see above). Another solution is to think more in terms of treatment careers while deemphasizing individual treatment episodes. Hser et al.'s (1988) innovative approach for accomplishing this was discussed above.

Finally, the tendency of funding agencies to support relatively short-term projects presents a problem for investigators. Carefully conducted treatment evaluation research may require several years of study.

Calculate Cost-Effectiveness of Each Program and Compare Interventions

Combining program costs to produce a total cost for each drug abuse treatment program is relatively straightforward. Once decisions have been made regarding which costs to include and how to adjust for inflation and present value, all that remains is to sum up the costs.

Combining program outcomes is quite a different matter. There is no simple way of combining multiple outcomes when many are measured on different scales. In fact, there is not even a way to combine measures of drug and alcohol use. Earlier it was noted that clients in DARP programs apparently reduced their use of narcotics while increasing their use of alcohol and marijuana. No mechanism exists for combining these two effects of DARP into an overall effectiveness rating on a dimension of substance abuse. The problem becomes more difficult when different dimensions are considered, such as drug use, emotional well-being, physical health, and criminal activity. Worst of all, a major finding in those studies that have included measures of several outcomes is that "over the short term (i.e., 6 to 12 months) the several dimensions of outcome (drug use, alcoholism, general health, work, crime, social and psychological well-being) are relatively independent" (Jaffe 1984).

If there is to be a solution to this problem, it will probably follow from progress in defining drug abuse and in specifying clear treatment goals. Such progress will at least lead to specification of

which outcomes should be incorporated into an overall index of effectiveness.

Once total program costs and overall indices of effectiveness exist, these two measures can be combined into a cost-effectiveness ratio for each drug abuse program and used to compare interventions with each other. Because these procedures are applicable across many fields of investigation and are relatively unaffected by the idiosyncrasies of the drug abuse field, they will not be described here. (See Kamlet 1989 for an up-to-date discussion of these procedures and their application in the health care field.)

Conclusion

Several interim steps must be taken before useful cost-effectiveness analyses of drug abuse treatment can be conducted. One of the most important is to define drug abuse and to specify the goals of drug abuse treatment. At this stage in the development of the field, however, agreement about these issues is unlikely. Therefore, researchers conducting cost-effectiveness analyses should at least make clear to others what definitions they are using when carrying out investigations. It is equally important that drug abuse treatment researchers adopt more rigorous research designs and avoid reliance on subjects' retrospective self-reports as a sole source of information about key variables.

Much of this paper has focused on the shortcomings of past research and on the difficulties in conducting rigorous studies. Nevertheless, there are good reasons for optimism about future research on the cost-effectiveness of drug abuse treatment. Although past studies have been seriously flawed, some of them have addressed many important methodological problems on which future research can build. Examination of past work also shows two positive trends. First, there has been a general improvement in the quality of drug abuse research, especially in the past few years. Second, this research has markedly increased knowledge about many aspects of drug abuse, including the

complexities of treatment. As indicated above, techniques exist to overcome all of the formidable obstacles to research in this area. If applied, these techniques will generate new and valuable information about the cost-effectiveness of drug abuse treatment.

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NOTES

- ¹ See Thompson and Fortess 1980 and Kamlet 1989 for discussions of the history of cost-effectiveness analysis and for several definitions.

DRUG ABUSE AMONG WORKERS AND EMPLOYEE ASSISTANCE PROGRAMS

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The problem of drug abuse in our society extends into the workplace. Recognizing its opportunity as an employer, the Federal Government took tangible steps to identify and eradicate drug use among Federal employees through an executive order (number 12564) issued by President Ronald Reagan in 1986. Moreover, the Federal Drug-Free Workplace Act of 1988 required that private employers with sizable Federal contracts or grants also take appropriate actions to bring about drug-free workplaces. Even before the public initiatives, many employers were increasing their efforts to deal with employee drug abuse, although many others have not as yet initiated formal programs of drug abuse prevention, identification, or treatment.

Employer responses have included chemical testing for the presence of drugs; coverage for drug abuse treatment services; sanctions against drug-using workers, or dismissal, or both; training of supervisors to detect signs of drug use and performance-related problems; formal written policies; and employee assistance programs (EAPs). Identification and referral of troubled employees have long been handled informally by many supervisors in the workplace. However, EAPs often provide a more formal structure and process for these activities, as well as the introduction of specially trained personnel (Walsh 1982). The purpose of this paper is to provide an overview of the role of EAPs in addressing the problem of drug use among workers. Further objectives include discussion of relevant policy and research issues, and formulation of future research directions on the role and performance of EAPs.

The structure of the paper is as follows: The first section describes drug use in the employed population and associated impairments of job performance. The next three sections deal with

EAP components and activities, employers' motivations for developing an EAP, and the contrast between EAPs and managed care. The fifth section provides a framework for measuring and evaluating the performance of EAPs as entities in the service delivery system. The following two sections present empirical data on EAP use and referral patterns, and empirical findings and discussion related to the potential effectiveness of EAPs. The concluding sections discuss public policy issues and directions for future research.

DRUG ABUSE AMONG WORKERS

Available survey data give some indication of the extent of drug use among workers. Cook (1989) presents data from a 1985 household survey conducted by the Gallup Organization, in which it was estimated that 11 percent of workers were current users of marijuana, and 2 percent of workers were current users of cocaine. Chi-square tests yielded no significant differences in current marijuana or cocaine use by educational level, nor in current cocaine use by occupational level. However, significant differences were observed for current marijuana use by occupational level, with business and farm owners and professional and managerial employees showing the lowest level of use (the rate for each was 7 percent).

Voss (1989) analyzed data from the 1985 National Household Survey, sponsored by the National Institute on Drug Abuse (NIDA), and found that 11.7 percent of full-time employed, 10.2 percent of part-time employed, and 21.5 percent of unemployed respondents had used marijuana in the past month. Voss also found that 4.0 percent of full-time employed, 2.2 percent of part-time employed, and 6.0 percent of unemployed respondents had used cocaine in the past month. The cocaine users, by and large, were a subset of

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the marijuana users. Both Cook and Voss also found that younger workers and males were more likely to be drug users.

Some results have become available from the 1988 National Household Survey sponsored by NIDA. Among the population of 20- to 40-year-old full-time workers, 22 percent used an illicit drug in the past year and 12 percent used one in the past month; of the latter, 10 percent used marijuana and 3 percent used cocaine. To date, these data have not been analyzed by occupational level.

The Gallup Organization recently conducted a survey of workers' perceptions (as distinguished from self-reports of use) for the Institute for a Drug-Free Workplace.¹ In that survey, 22 percent of employees nationwide said that illegal drug use is at least "somewhat widespread" at their workplace, 49 percent acknowledged that illegal drug use occurs where they work, and 32 percent admitted that illegal drug *selling* occurs at the work site. Moreover, employees perceived drugs as the greatest problem facing the United States today.

The costs of drug use are borne by businesses in several ways other than the direct costs of treatment. Left unfettered, drug use can contribute to such indirect costs as higher rates of absenteeism and employee turnover. In an informative study being carried out by the U.S. Postal Service, job applicants were tested for drug use and followed longitudinally in their work experience (Normand and Salyards 1989). Test results were used for research purposes only and were not available to those responsible for making hiring decisions. That study includes among its findings to date that

- overall, over 8 percent of those hired had tested positive before being hired: about two-thirds for marijuana, one-quarter for cocaine, and 10 percent for other drugs;

- employees who tested positive for drugs prior to employment were absent at a rate 43 percent greater than those who tested negative;
- those who tested positive for cocaine were more than three times likelier to be heavy leave users than those who tested negative; and
- involuntary job separation measured 40 percent higher among drug positive group members and nearly 100 percent higher among cocaine-positive applicants.

A study of Navy recruits showed similar types of findings (Blank and Fenton 1989). During early stages of enlistment, recruits were tested for drug use. Those who tested positive for illicit drugs generally were not allowed to join the Navy, but those who tested positive for marijuana alone were not excluded for that reason. Following those recruits in their Navy experience showed that

- 14 percent of recruits who had tested positive for marijuana in 1985 were discharged within 2-1/2 years for drug- or alcohol-related problems, versus 1 percent of the recruits who had tested negative; and
- another 21 percent of those who had tested positive were discharged for behavioral or performance problems, versus 8 percent of the control group.

Thus, drug use is associated with several types of indirect costs to business. However, related findings from the Navy study show that the recruits who tested positive were statistically different from those who tested negative in other key dimensions, such as race, education, and a measure of intelligence. From both a human and a program evaluation standpoint, drug abuse is but one factor that can affect workers' job performance. In other words, not all differences in job performance between drug abusers and other workers are due to drugs.

EAP COMPONENTS AND ACTIVITIES

"Employee assistance program" is a universal term for "a set of company policies and procedures for identifying, or responding to, personal or emotional problems of employees which interfere, directly or indirectly, with job performance" (Walsh 1982). EAPs are involved in four general types of activities: direct services for employees, prevention and education, training and consultation for supervisors, and support for administrative functions (budgeting, recordkeeping, etc.) EAPs are said to be as diverse as the companies that start them, varying on several dimensions including their organizational locus, referral processes, use of outside providers, staffing patterns, and financial arrangements, as well as the range of problems addressed.

Roman and Blum (1985) describe a core technology for EAPs that includes dimensions of supervisory and benefits management:

- identifying problem employees using criteria related to job performance;
- providing consultative assistance to supervisors, managers, and union shop stewards;
- encouraging supervisors to use "constructive confrontation" when dealing with problem employees, rather than ignoring or covering up problems;
- matching employees with the most appropriate community resources;
- developing optimal relationships with providers in the community; and
- promulgating the concept that the workplace can be a setting for providing constructive assistance with drug and alcohol problems.

An EAP may be developed and operated internally or by contract with outside vendors. No clear professional standards or formal certification are currently applicable to EAPs. Furthermore, there are no reporting requirements or uniform data collection activities that might be associated with licensure or accreditation (Jones 1987).²

Through surveys, it is possible to gauge the prevalence of various activities among EAPs currently operating in the public and private sectors. One survey, sponsored by the Occupational Safety and Health Administration (OSHA) and administered to 1,381 public sector entities (including municipalities, counties, school districts, etc.) (Quinn 1989), yielded 509 (37 percent) responses, of which 54 percent reported having an EAP. Shown in table 1 are the percentages of public sector EAPs that offer various services. Virtually all respondents operating EAPs claimed to offer referrals and short-term counseling (99 percent and 93 percent, respectively). Furthermore, all EAPs were reported to offer either referral or treatment services for alcoholism and drug abuse. Large majorities of responding members with EAPs also provide many other services related to the core technology, including ongoing EAP promotion (88 percent), management consultations (88 percent), diagnostic assessment (86 percent), and educational seminars (80 percent).

Information about EAPs within private, nonagricultural firms in the United States has been obtained through the 1988 Bureau of Labor Statistics (BLS) Survey of Anti-Drug Programs (U.S. Department of Labor 1989). Findings showed that the main components of these programs were referral services (97.2 percent), followup services (81.9 percent), counseling services (76.6 percent), assistance for family members (58.9 percent), educational awareness programs (56.3 percent), and a telephone hot line (48.6 percent). Seven percent of establishments in the sample had an EAP, and approximately 31 percent of workers had access to EAP services. At the time of the survey, decisionmakers in 3 percent of those establishments without EAPs were

planning to begin one within the next year, suggesting a rapid rate of growth in the number of these programs.

EAPs are most often operated by or contracted through the personnel or human resource components of the firm and are financed as a line item under general operating expenses (Backer 1989). External EAPs are typically paid on the basis of the number of workers eligible for services--that is, an annual capitation--although flat fees and fee-for-service arrangements are also used (Quinn 1989). EAP services typically cost an employer about \$20-\$30 per employee per year, regardless of program use (Masi and Friedland 1988).

MOTIVATIONS FOR DEVELOPING AN EAP

The EAP field can trace its conceptual and programmatic roots directly back to occupational alcoholism programs (OAPs). During the 1940s, a handful of such programs were started in establishments in response to concerns about the impact of alcohol abuse on workers and job performance. There were several hundred OAPs by the early 1970s, and 4,400 by 1979-80 (National Institute on Alcohol Abuse and Alcoholism 1984). More than any other single problem among workers, alcohol abuse has contributed to the development of modern EAPs.

Responding to the growing problem of drug abuse in the workplace through an EAP was a natural extension of the OAP approach. Moreover, an even greater widening of EAP scope occurs in so-called broadbrush programs that offer services for mental health, marital and family issues, financial counseling, and other employee problems. This broadening resulted from confidence or hope that EAP components could be used successfully to address a wider range of issues facing workers, as well as from the natural consequences of training supervisors (primarily on clinical and ethical grounds) to base EAP referrals on job performance issues rather than on their own preliminary

diagnostic impressions. The attention paid to functional limitations and their diverse causes reflects a more social, as distinct from a medical, orientation among most EAP staff to the needs of workers.³

A particular employer may have one or more of several potential motivations for developing an EAP.⁴ A basic premise is that significant needs exist among the work force that would merit direct intervention--a premise that may or may not be based on formal data analysis. With respect to drug abuse, the need to act can be related to safety, criminality, productivity, absenteeism, morale, and so on. A review of the literature describes a number of potential motivations for an employer to develop an EAP:

- an acceptance of available empirical evidence that EAPs are likely to be cost-effective to the employer (Rich 1987);
- a belief in a truism that EAPs are worthwhile (Decker et al. 1986);
- an observation that so many other employers have EAPs, and the conclusion that EAPs must represent the state of the art in human resource management (Roman and Blum In Press);
- a willingness to provide services to workers for the sake of their well-being and for good will, even if the financial return may not justify the investment (Straussner 1988a);
- a need for protection against legal repercussions from workers sanctioned or dismissed for drug abuse, or adversely affected in other ways, such as by drug testing (Donkin 1989); and
- a need to be sure of compliance with legislation and regulations, such as the Federal Drug-Free Workplace Act of 1988.

The motivations underlying establishment of an EAP in any given company depend on the relevant industry, size of the firm, related corporate philosophies, fiscal strength, preliminary data analysis, and other perceptions of need among workers. A survey by Backer (1989) suggests that a large majority of organizations with EAPs want to benefit disabled employees, more than half want to relieve supervisors of workers' problems, over 40 percent see EAPs as a mechanism for health care cost containment, and about 30 percent hope to avoid litigation by offering an EAP.

EAPs AND MANAGED CARE

A fundamental assumption behind EAPs is that both the sponsoring organization and its employees can benefit from improved access to quality care. Many EAPs include education and prevention services as well. Efforts in this regard include providing drug abuse training for supervisors and consultation services to supervisors as particular problems arise. Thus, it has been assumed that total employer costs can be reduced over the long run through investment in prevention and treatment services (Watkins 1988). However, employers have increasingly tried to control the cost of employee health benefits, often through managed care techniques such as precertification of service use, mandatory second opinions, and so on. In the future, EAPs may be required to take a more active role in controlling treatment costs.

Table 2 lists the major components of EAPs and managed care services, as presented by Parker (1989). It can be seen that there is some overlap in basic functions. However, EAPs focus on improving access and increasing use, whereas managed care activities scrutinize use patterns and reshape reimbursement and delivery "systems" to avoid unnecessary costs. Management of costs related to mental health and substance abuse is becoming increasingly widespread (Sims 1988; Wenzel 1986), and making EAPs a vehicle for containment of costs related to services is

becoming more common (Bridwell et al. 1988; Blum 1989).

To some employers, an EAP offers important opportunities for controlling costs through managed care: EAPs combine face-to-face intake of potential clients with the capacity to select and negotiate with providers and to monitor outcomes. However, certain tensions could surround the use of these programs for the explicit purpose of limiting service costs. EAP staff typically view their role as that of confidential advocate for employees and not as that of adversary or obstacle to services. Although the extent to which managed care and other cost containment objectives eventually will be integrated into EAPs is still unclear, it may become increasingly important for EAPs to document the largely untested assumption that cost savings can result from increased access to drug abuse treatment and other employee assistance services.

EAP EVALUATION ISSUES

Favorable results from formal evaluations might be necessary for the long-run survival of many EAPs. However, research on EAP evaluation has been extremely limited--primarily descriptive or promotional--and without much rigor in evaluation methodology or design (Cayer and Perry 1988). The employee assistance field lacks a history of scientific investigation and formal research training that such rigorous evaluations would need (Jones 1987).

The measures on which an EAP might be evaluated depend on the program's goals as perceived and specified by relevant powers within the sponsoring organization. Whether internal or external (i.e., contractual), EAPs need continuing support from diverse bases of power (Ford and Ford 1987) and must appeal to a number of constituencies, including top management, supervisors, human resource managers, unions, and employees. When assessing the value of an EAP, the various constituencies can differ in the

relative emphasis they place on potential alternative evaluation criteria (Straussner 1988b). In the context of a study of EAPs in metropolitan New York, Straussner (1988b) identifies the opposing views of top management, employees, and EAP staff: Top management is often concerned about avoiding unnecessary costs, whereas employees and EAP staff value the accessibility and confidentiality of EAP services.

Another important perspective is that of "front line" supervisors, whose involvement in identification, referral, and monitoring is considered by some to be essential to an EAP's success (Googins 1989; Hoffman and Roman 1984). Young et al. (1987) found that the major determinant of supervisors' willingness to make EAP referrals was their own perception of program effectiveness.

Recognizing the multifaceted nature of EAPs and the significance of alternative viewpoints, Cayer and Perry (1988) propose a comprehensive evaluation framework for EAPs. Their framework calls for several areas of study: program effort, performance, penetration into the target population, efficiency, and process evaluation.

Effort

To ascertain whether savings attributable to an EAP more than offset its costs, the expenses of operating an EAP must be included when evaluating the program's effectiveness in reducing personnel costs. The effort behind an EAP includes the labor and materials associated with the program, as well as the additional costs that result from increasing employee use of treatment services.

Performance

Yamatani (1988) argues for consideration of many measures of outcome, including tangible and intangible benefits, to avoid unwarranted underestimation of an EAP's total value. A

number of measures of EAP performance have been considered in past studies (although usually not simultaneously), including changes in substance abuse behavior, work performance indicators, and cost reduction (Kurtz and Googins 1982). Within those categories, many variables have been suggested for measuring EAP performance, some of which may be recorded for administrative purposes and many of which do not require special permission from employees to use for research purposes (Decker et al. 1986).⁵

From the EAP and employer perspective, the most direct and relevant outcomes pertain to job performance and reduction in employer costs. Among the measures in these categories given consideration in past studies are absenteeism, use of sick benefits, work-related accidents and workers' compensation claims, employee turnover, employee productivity, and supervisors' evaluations of work performance. The public policy perspective of zero tolerance would consider measures related directly to drug use to be just as relevant. These might include abstinence and reduction in drug use, substitution of certain substances for others, and involvement with rehabilitation or treatment services.

Penetration

Penetration refers to the number of individuals within the target population (in this case, drug-using workers) who are helped by available services. To measure EAP penetration, it would be necessary to know the drug abuse prevalence rates in the worker population. Browne (1988) describes how employers often estimate substance abuse rates: they use national estimates by industry, indirect indicators such as absenteeism, and employee reporting. To the extent that an EAP is effective, actual prevalence rates should decline over time.

Determining a definition for a successful penetration rate is a complex undertaking because it is difficult to measure the underlying prevalence rates accurately. Moreover, the ability of an EAP to reach certain workers depends on the workers'

level of autonomy, work environment, responsibilities, and so on. Also, there may be barriers to reaching certain segments of the employee population due to cultural or gender issues (Gray and Lanier 1985/86; Young et al. 1987).

Efficiency

The benefits and costs of an EAP can be analyzed to address two important evaluation issues: whether an EAP is worthwhile, and whether an EAP would be more valuable if certain modifications were made. Depending on the perspective taken in the evaluation, decisions regarding what to include as benefits and costs could differ.

Process Evaluation

It is important for an evaluation to include sufficiently detailed descriptive information to gain insight into how observed outcomes were achieved. Cayer and Perry (1988) list four issues to be addressed in a process evaluation: the attributes of an EAP, including client flow; differential treatment results for subcategories of workers; conditions of EAP service success (e.g., timing and location); and specifications of treatment program effects (i.e., direct effects of EAP activities on specific indicators). Operational definitions and empirical criteria for measuring success should be related to the processes and goals associated with the services and treatment modalities made available by the EAP.

EAP USE AND REFERRAL PATTERNS

There is a general lack of detailed recordkeeping among EAPs due to the primacy of confidentiality and the absence of any industry compliance standards. Table 3 shows the percentages of respondents in the survey of public sector EAPs that measured various factors in relation to

program use (Quinn 1989). It can be seen that large majorities of those EAPs neglected many potentially useful measures for evaluating program performance. Almost half did not even measure program use. Fewer than 40 percent of the EAPs measured treatment outcomes or referral effectiveness, and only 26 percent measured recovery rates. Factors representing indirect costs to the employer were measured by relatively small percentages.

Some estimates suggest that as few as 2 to 3 percent of eligible employees ever receive EAP services (Masi 1984; Roth 1981). Telephone surveys in 1982 and 1983 of 1,740 randomly selected and employed residents in four New England States showed that 13 percent of all respondents ever had a drug or alcohol problem and that 2 percent had one currently (Hingson et al. 1985). Eleven percent of those with alcohol or drug problems had sought help from outside programs; however, only 4 percent had ever sought help at work although 14 percent of all respondents said there were counselors at work to help with such problems. This finding could result partly from the rapid dispersion of programs in the workplace. However, there were similar findings in a 1987 survey of employed callers to the hot line 1-800-COCAINE (Herridge and Gold 1988), in which only 2 percent of respondents were concerned about drug testing programs at work, whereas the remainder called because of their desperate need for treatment. Furthermore, although 16 percent of males and 25 percent of females calling were at companies with EAPs, only 1 percent had ever used their EAP.

Other studies also provide information about the relative proportion of EAP clients with drug problems. In an analysis of EAPs in the New York metropolitan area in 1982, it was found that 4.4 percent of all eligible workers used an EAP in that year (Straussner 1988a), 5 percent of whom were identified as having drug problems versus 25 percent who had alcohol problems. Studying a sample of 115 internal EAPs in six States, Roman (1989) found that substance abuse constituted between 30 and 40 percent of EAP caseloads on

average in 1988.⁶ The percentages of those clients choosing various substances were 60-65 percent for alcohol, 21-26 percent for cocaine or crack, 8-10 percent for marijuana, 6-8 percent for other illegal drugs, 2-4 percent for diazepam, and 3-5 percent for other prescription drugs. Taking the midpoints of the relevant values (for convenience), one may infer that illicit drugs were chosen by approximately 14 percent of the EAP clients.

Findings from an analysis of 1,238 EAPs nationwide, as part of the National Study of Workplace Drug Abuse Programs, show that EAPs deal with a wide variety of drugs but that the number of drug abusers seen across programs of all sizes is relatively small (Backer 1989). In that study, 8.5 percent of EAP respondents did not serve any drug abusers, 73.1 percent served from 1 to 10 drug abusers per month, 11.4 percent served from 11 to 25, and 7 percent served more than 25. Nearly all responding EAPs referred clients to a number of providers: inpatient chemical dependency facilities (98.9 percent), outpatient chemical dependency facilities (97.8 percent), 12-step programs or self-help groups (97.5 percent), family group counseling (94.5 percent), and a public drug abuse agency (86.1 percent). Fewer EAPs offered treatment services directly to clients; such services entailed brief in-program treatment of two to five sessions (74.3 percent), and more lengthy in-program treatment (9.7 percent).

Jones (1987) described the use patterns of three EAPs: one internal program in a transportation firm, one in a high-tech manufacturing firm, and an external program operating under individual contracts with several client firms. Table 4 shows some pertinent findings from that study, including the annual use rates and the percentages of clients with various assessed problems. Apparently in those EAPs, drug-abusing workers represent relatively small proportions of the total caseloads although the percentages seem to range widely.

In that study it was found that counselors assessed more emotional, alcohol or other drug, and

physical or sexual abuse problems than clients had expressed as their main problem. Conversely, staff assessed fewer occupational, financial, educational, and job stress problems than were presented by clients. The largest discrepancies were observed for clients deemed to have alcohol or drug problems, of whom 56 percent had first indicated a different problem. The broader social service model used in broadbrush EAPs may bring substance-abusing workers into treatment earlier by establishing contact through other, "safer" complaints. Jones (1987) also noted that among employees' dependents who used an EAP, substance abuse problems were more prevalent (24 percent) than among employees who were clients of the EAP (20 percent).

Also shown in that study were counselor referral patterns for clients of the three EAPs, as presented in table 5. The patterns across the three programs are quite different, with inpatient referrals ranging from 2 percent to 35 percent, and in-program counseling ranging from 0 percent to 62 percent. Those differences are due in part to differences in EAP staffing and other components, as well as to differences in the mix of problems presented by EAP clients (shown in table 4). Such diversity highlights the difficulties involved in formally assessing the value and performance of an EAP and in comparing performance across programs.

MEASURING THE VALUE OF EAPS

Subjective Impressions

In a survey conducted by Mercer Meidinger Hansen, Inc. (1988), Fortune 1000 chief executive officers (CEOs) and human resource managers reported EAPs to be the most important activity in dealing with their firms' substance abuse problems.⁷ Yet results from a survey by Roman and Blum (1989) showed that, in a sample of 439 organizations, very few companies with an EAP had analyzed the costs and benefits of the program.

Jones (1987) presents some client satisfaction survey findings for one EAP.⁸ One month after receiving EAP services, almost all respondents (96 percent) believed that EAP counselors were knowledgeable, 78 percent were satisfied with the referral they were given, and the lowest number (65 percent) indicated their problems had improved. Yet in the national survey of EAPs cited earlier (Backer 1989), less than one-third of respondents rated their program as being even "fairly effective" in meeting the challenges of drug abuse in the workplace. This modest evaluation of their own activities stands in rather pronounced contrast to many writings in the field, which often imply that the success of EAPs is well established.

This apparent discrepancy raises several potentially important issues. First, EAPs may have differential impacts across categories of need among clients served; while generally successful overall, EAPs may be having less success with drug-abusing clients. Second, EAP staff may perceive that only a fraction of all drug abusers in the workplace are using program services or that many of the workers with more severe drug problems have yet to be reached. Finally, the ambiguity highlights the potential value of comprehensive and objective program evaluations that carefully assess the value of EAPs for drug abusers.

Reviews of Related Studies

A thorough review of the state of knowledge regarding OAPs (as noted above, the progenitors of the modern EAPs) was undertaken by Kurtz et al. (1984). Measures analyzed in the studies reviewed included (1) changes in rates of alcohol consumption, (2) improvements in job performance, and (3) impacts on costs associated with substance abuse. The authors concluded from their critical review that none of the studies was designed well enough to permit inferences about the effectiveness of OAPs.

Absent from those OAP studies was any attempt to randomize assignment into OAP interventions and

control groups or into alternative modalities within the OAP.⁹ Treatment and comparison groups were not sufficiently equivalent to provide a proper basis of comparison. Furthermore, documentation of important study details, such as timeframe and characteristics of comparison groups, was inadequate. Similar conclusions were reached by Apsler and Harding in this volume regarding studies of the cost-effectiveness of drug abuse treatment modalities, and by Moskowitz (1989) in a critical review of workplace (and other) alcohol prevention program evaluations.

EAP Outcome Studies

A few EAP evaluations were found in our review of the published literature. These evaluations attempted to quantify and document savings attributable to EAP services, and, in a few cases, they also compared savings estimates with the estimated cost of operating the program. Unfortunately, many of the same weaknesses noted earlier in others' reviews also pertain to these EAP evaluations.

A typical approach to measuring the benefits of an EAP is to conduct a study with a one-group pretest-posttest preexperimental design. In such studies, observations are made on one or more measures of interest for one group of employees--namely EAP clients--before and after exposure to EAP services. Dollar savings can be calculated according to a formula such as the following:

$$\text{Total EAP Savings} = (\text{Reduction in Excess Cost}) \times (\text{Relevant Time Period}) \times (\text{Number of Clients Served}).$$

Where:

Reduction in Excess Cost refers to changes in the magnitude of the criterion variable(s) between the first and second observation (e.g., fewer sick days per person per month);

Relevant Time Period refers to the amount of time for which the savings are expected to continue or until some defined end point (such as after one year); and

Number of Clients Served refers to the number of employees who use EAP services.

Depending on the criterion variable, cost can be measured directly (such as health care expenditures) or indirectly (such as a period of absence multiplied by an employee's wage rate).

The data and analysis presented in Coyne (1987) exemplify this type of approach. The study reports the evaluation of a broadbrush EAP established in 1981 at the Burlington Northern Railroad to replace an existing alcoholism program. Coyne presents background material regarding the history, goals, and methods of the EAP, painting a picture of a program undergoing significant change and growth: from 1981 to 1985 the overall caseload more than doubled and the number of substance abuse cases increased by 77 percent. Given that the company's work force was declining in number during that period, the growing volume of EAP clients was not due to a growing pool of workers.

The author claims that the EAP continues to reward the company in such ways as lower use of health insurance and better on-time arrival and refers to the findings shown in table 6. At three points in time (at intake, after 3 months, and after 12 months), EAP clients were assessed in terms of their experience on several measures in the previous month. On most of the indicators, the largest proportion of clients showed signs of impairment at the time of entrance into the

program. Followup measures generally showed improvement. For example, 17 percent of clients had used health insurance in the month prior to intake, whereas 8 percent and 5 percent of clients, respectively, had used health insurance during the later two 1-month periods of observation. Similar findings are shown for all the measures except whether clients had used medical leave, which other studies have attributed to compliance in treatment.

This type of methodological approach poses potential threats to the internal validity--that is, to the ability to reach conclusions on the questions at hand. Those threats generally take the form of plausible alternative hypotheses that involve the effects of factors not recognized or controlled for in the research design. For example, similar declines in absenteeism could have occurred for all workers for reasons unrelated to the EAP. The research design used by Coyne is a one-group pretest-posttest design, in which no control or comparison group data are presented; the EAP clients presumably serve as their own control.

Probably the most critical factor for which appropriate controls are lacking in EAP evaluations to date is selection effects: most of the study population (i.e., EAP clients) volunteer for services or are formally referred to them because job performance has suffered. Choosing to use EAP services and being formally referred by a supervisor are important indicators that strongly suggest either unmanageable circumstances at a certain point in time or a timely decision to avert more serious future consequences of a problem. For example, a drug abuser may "hit bottom" or be given an ultimatum by a supervisor. Eventual outcomes are potentially influenced by such factors as treatment, management scrutiny, and spontaneous recovery in addition to any value added by an EAP.

It is not clear, however, whether self-referred clients and clients referred by supervisors differ significantly in terms of expected outcomes. Available evidence suggests that outcomes for these two groups, on average, are similar (Smart

1974; Moberg 1974). In fact, Googins (1989) argues that drug-abusing employees who self-refer to EAPs may be responding to informal pressures from co-workers or family or both.

Referring to EAP data developed from a one-group pretest-posttest design, Jones (1987) states, "It is clear the EAP averts some corporate costs incurred by troubled employees whose problems are causing higher rates of health care utilization, absenteeism, and lowered productivity." That study presents data on referral patterns for one employer group under contract with an external EAP vendor. The author concludes that it is "safe to say that costs would have been higher had employees not contacted the EAP and selected providers on their own." Evidence provided to substantiate that assertion are a purportedly low rate of referrals to inpatient settings (2 percent) and a total of 32 percent of referrals to "no-cost" treatments--that is, to EAP counseling only (23 percent) and to self-help groups (9 percent). Without making a number of assumptions or providing comparison data, conclusions about cost savings for the employer seem premature.

Yamatani (1988) suggests that EAP outcome studies would be improved if values for the criterion variables for program clients were compared with values for other employees--i.e., norms for the company or for department, job type, etc.¹⁰ Calculations of savings would be modified to reflect net changes rather than absolute changes in criterion measures. Instead of a one-group research design, all employees or non-EAP employees would serve as the comparison group. But although such comparison groups would help to reduce confounding alternative hypotheses related to possible history and maturation effects, they would fail to account for the serious threats to internal validity emanating from likely selection effects.

Groeneveld et al. (1985) reached comparatively pessimistic conclusions regarding the effectiveness of an EAP operated by the Canadian National Rail, Great Lakes Region. Two approaches were taken to measure the program's effectiveness: (1)

multiple-year observations of EAP clients before and after EAP referral, and (2) comparisons of EAP client group averages to company averages.

Using the first approach, it was found by using several measures that (1) EAP clients were progressively worse off and cost the company more in the years leading up to the EAP contact, (2) problem indicators peaked in the referral year, and (3) indicators declined somewhat in the following years but did not return to prior levels. Measures included the number of disciplinary actions, absenteeism, number of health benefit claims, sick days, and indemnity benefits. That part of the study bears some resemblance to a time-series design in that multiple observations were made of the same people for up to 5 years prior to being seen by the EAP and for up to 3 years afterward. However, because inclusion in the experimental group was nonrandom across employees and over time and because only EAP clients were observed, it would be difficult or impossible to infer the impact of the EAP. Moreover, there was no discussion of the possible effects of a sample attrition rate of about 64 percent.¹¹ A confounding factor, therefore, was that individuals who were lost from the sample could have biased the group averages.

Using the second approach, Groeneveld et al. (1985) reached similar conclusions. On the basis of observing that group mean values for the EAP client group did not converge to company norms, they concluded that EAP interventions were not likely to be cost-effective. The authors saw the findings from the two approaches to be in agreement. The corroboration from the second approach helps us to infer that history and maturation probably did not seriously confound the results.

In an evaluation of the EAP operated by McDonnell Douglas Corporation (MDC), medical claims costs, absenteeism, and job termination were analyzed for alcoholics, drug abusers, mixed substance abusers, and mental health service users (Smith and Mahoney 1989). Two study populations consisted of employees who used

insurance benefits for any of those conditions and who (1) used the MDC EAP or (2) did not use the EAP. Analysis of EAP impacts were based on comparing the cost experiences of those EAP clients with the cost experiences of other substance abuse and mental health service users, and with the experiences of employees who did not use any substance abuse or mental health services. Mean values for the comparison groups were adjusted for age, sex, marital status, family size, geographic location, years of education, and job type (hourly or salaried).

This study has several advantages over most previous EAP evaluations. First, it compares the experiences of EAP clients with those of other users of services. Second, data are analyzed separately according to the type of problem being addressed (e.g., alcohol, drugs). Third, the populations are observed for up to several years prior to and following the base year.

The findings show quite marked differences in the long-run costs of EAP clients relative to those of other users of similar services. Among the findings are that EAP clients and their families have significantly lower future medical costs, have fewer absences in future periods, and are less likely to leave employment than other substance abuse and mental health service users.

Herein lies a strength of this evaluation: making comparisons with other service users is useful and informative in that it may better isolate the special value of the EAP intervention. However, we should avoid the temptation to conclude that observed differences are solely the result of the EAP. From use data alone, it is always difficult to distinguish between health status differences and provider efficiency or quality differences.

Use rates and costs are strongly affected by severity of the problems being treated, their duration and chronicity, the existence of other conditions, and so on. For example, is a typical person who is being treated by a physician for ulcers just as likely to seek EAP consultation when getting treatment for alcohol detoxification as is

someone with no established ties to a physician? Many such questions must be addressed explicitly and empirically to be sure that EAP clients are not different on average from other users of substance abuse and mental health services.

MDC chose to assume that observed differences between EAP clients and other employees were due to efficiency and quality of care induced by the EAP. Based on reaching 1,032 individuals in 1988, the study concluded that the "minimum dollar-savings" would be \$5.1 million over the next 3 years, of which \$2 million would be saved in employee medical claims, \$2.3 million would be saved in dependent medical claims, and \$800,000 would result from reduced absenteeism. These savings represent a final investment-return ratio of 4 to 1.

With so much change and diversity in the EAP industry, substantial threats to external validity exist as well--that is, to the ability to generalize evaluation results beyond the immediate conditions and circumstances. To address this issue, evaluations will need to carefully define in operational terms both the activities that are under study and the contextual factors that could affect findings.

Small sample size may turn out to be a problem for many EAP evaluations. That drug abusers make up a small fraction of the total caseload in many programs suggests that more widespread and cooperative research among EAPs will be needed.

PUBLIC POLICY ISSUES

To help achieve a drug-free workplace, employers have several options to consider. A basic question is whether the corporate philosophy favors punitive versus supportive responses to drug abuse among workers (Roman and Blum In Press). In other words, is the primary goal of the company's policies about drug abuse

- rehabilitation,
- separation from employment,

- provision of services to workers who self-refer, or
- monitoring of known drug abusers?

As is implied by the name "employee assistance program," an EAP represents a response by an employer that is aimed at helping and rehabilitating drug-abusing workers. To the extent that these goals are pursued and attained in practice, there is a socially advantageous overlap between private and public interests. Given limited resources to combat drug abuse, the EAP represents a potentially valuable investment in prevention and in training of front-line monitors (i.e., supervisors). Moreover, because of its placement in the workplace, the approach seems applicable to a vast cross section of American society.

If EAPs are effective components in the service delivery system for helping drug abusers, public policy debate may consider what means are available to encourage or even require such services on the part of employers. Current Federal policy encourages employers to foster drug-free workplaces; thus, to the extent that EAPs can be shown to lessen drug abuse among workers, further specificity regarding EAPs might be warranted in terms of what constitutes appropriate efforts on the part of employers (McGuire et al. in this volume).

Another aspect of the public interest in EAPs has to do with helping to generate and disseminate information about what types of drug abuse service interventions, including alternative EAP models, are most efficient and effective. However, based on studies done to date, it seems difficult to attain this objective. Some employers see EAPs as their most promising tool for dealing with drug abuse in the 1990s; they believe that the EAP approach represents the best chance to identify drug-abusing workers and that investment in the welfare of employees makes good sense. Evaluation research that demonstrates the value of EAPs could reinforce this positive perspective. If such evidence is lacking, however, employers may be more likely to abandon the employee assistance

approach in favor of more punitive approaches to arriving at drug-free workplaces.

A related challenge is to improve the penetration of EAP services into the target population. The current industry average for use of EAPs is approximately 5 percent of eligible workers for all types of client services offered, with typically only a fraction of those services being for drug abuse. This contrasts with estimates of drug abuse rates of greater than 10 percent among the employed population. Expansion and modification of the EAP to meet this challenge will depend on better information about what can work and how to implement effective programs in various types of work settings.

Although developing broadbrush programs may reduce the stigma associated with EAP use, the corresponding increases in use and recovery rates may not indicate deeper penetration into, or increased success with, the population with the greatest needs. Because most external EAPs are paid fixed amounts based on the size of the eligible population, it also may be in their financial interest to serve healthier workers. Generally, all employees within a company are eligible for EAP services.

Several factors are likely to bring about changes in EAPs over the next few years. Potential linkages to managed care, consolidation in the industry of EAP vendors, and drug testing in the workplace could affect the mission or operation of EAPs or both. Useful policy objectives would be to monitor and document the evolution of EAPs, and to exert influence where appropriate to reinforce their mission of getting drug users and other troubled workers into appropriate treatment.

There are some caveats or public policy concerns that should be acknowledged. It is important to safeguard the integrity of the EAP industry as well as the welfare and civil rights of employees. For example, an employer might use the existence of an EAP as a ruse to deflect attention from an alternative agenda for identifying and dismissing drug-using workers (e.g., drug testing). That

possibility highlights the importance of confidentiality with regard to personnel and medical records. Another hidden purpose for an EAP could be to limit the financial responsibility of employers for providing drug abuse treatment. For example, providing treatment benefits "in-house" only (such as through an EAP), rather than through general medical benefits, could be a mechanism for rationing services and controlling costs. In a case of court-ordered treatment, that strategy could help to limit potentially large costs to the employer. Similarly, savings could accrue by limiting access to drug abuse treatments for workers' dependents.

DIRECTIONS FOR FUTURE RESEARCH

It would be beneficial to pursue most or all of the types of studies discussed in the EAP evaluation framework: program effort, performance, penetration into the target population, efficiency, and process evaluation. Findings from each type of study could be used to guide decisionmaking regarding EAP model design, clinical interventions, staffing and referral patterns, adjunct services, and data-gathering activities.

Perhaps the most fruitful category of research questions has to do with outcomes associated with EAP service interventions. In that regard, it will be necessary to reach a better definition of what services an EAP is offering, what outcomes are being attributed to those services, and what would happen if there were no EAP. A pitfall in much of the EAP literature is an implicit assumption that little or nothing positive or therapeutic would occur in the absence of an EAP. Formally, this assumption shows up in the omission of suitable comparison or control groups (groups drawn from the same population of troubled employees) in EAP evaluation studies.

In fact, other resources are available to employees, whether or not EAP services are available. For drug abusers, an EAP often acts as an intermediary between the employee with needs and

the health care providers in the community (which more often than not are covered by employer health insurance) and other sources of help, such as 12-step or social service programs. Given the presence of health insurance benefits, self-help programs, attentive supervisors, and readily available information from many sources about drug abuse, many of the activities that are formalized by an EAP are occurring informally in other settings as well.

There are several EAP outcome measures to consider from a public policy perspective. First, it would be important to understand the impact EAPs may have on the ability of workers to avoid dismissal. The expectation of cost-effectiveness seems to vary with the ability to replace drug-abusing workers. In other words, an EAP could be a better investment when replacement workers are difficult to find, costly to train, or both. One clinician remarked that EAP referrals from client firms varied widely depending on local industry specific unemployment rates. Second, the ability of EAPs to attract drug abusers into treatment is an important aspect to consider. In this regard, there could be competing effects in that EAPs may be successful at reaching out to drug abusers while formal drug abuse services arranged by an employer may be intimidating. Third, the value of actual clinical outcomes of EAP services is worthy of study. Although the issue raises difficulties with sample attrition, studies ought to consider the long-run perspective of society and of many employers by continuing to observe populations several years into the future.

A research agenda dealing with EAPs and drug use could comprise three types of studies:

- Cross-sectional studies of employer groups. This type of study would use multivariate statistical methodologies to make explicit comparisons across employer groups, both with and without EAPs. By enlisting and orchestrating the combined efforts of several establishments, researchers may attain benefits without the perceived effects of adverse publicity that can arise for employers

when drug studies in a specified company are made known to the public. Assessments of EAP impacts should include measures of the prevalence and severity of drug abuse for all workers, in addition to any focused studies on the users of services.

- Tracer analyses, with individuals being the unit of observation. To investigate the outcomes associated with alternative clinical technologies, studies could be conducted that trace the experiences of individuals treated for certain conditions through assessment and referral by an EAP. Outcomes from deliberate matching of clients and services, which is part of the core technology of EAPs, could be used to assess the effectiveness of such activities. By following the experiences of individuals, researchers could study the relationships among severity, attitude, and other person characteristics in conjunction with treatment modality, setting, cost of treatment, and outcomes.
- Case studies of particular EAP programs. Further study of "model" EAPs could be used to document the components of structure and process within EAPs that are perceived to be most innovative or effective. Case studies could provide a better appreciation of the interrelationships between EAP activities, other employer initiatives, and outcomes that have bearing on public policy.

In conclusion, EAPs could represent a valuable tool against drug abuse. They offer an opportunity to deal with this public problem in a way that appeals to the private interests of both employee and employer. So far, however, research has not rigorously documented the cost-effectiveness of various EAP components. Future research attention ought to be devoted to evaluating EAP components in terms of their unique contribution to the reduction of drug abuse and its associated problems in the workplace. Studies need to give more careful attention to specifying the EAP components that are operating, develop more

adequate research designs, investigate possible limitations and biases, and clearly operationalize outcome measures.

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²Clinicians who work under the auspices of an EAP, however, must adhere to standards pertaining to their particular professions. Furthermore, an EAP's offering of clinical and other services could be accompanied by increased legal liabilities to the host company. National survey findings suggest that 1 in 20 EAPs may have been sued for some aspect of service delivery (Backer 1989).

³Drug testing in the workplace represents a reversal of the direction taken by EAPs to focus on job impairment rather than on the existence of a specific problem (Googins 1989). Some employers are administering certain behavioral and motor skills tests instead of urine tests, which represent a middle ground.

⁴Individual employers most often are the originators or purchasers of EAPs, although unions and consortia of small businesses also make EAPs available to workers (Backer 1989; Vinton and Brennan 1988).

⁵Variables that may require release of information include job efficiency decline, alcohol and drug abuse, violations of rules, and abuse of health benefits.

⁶Internal EAPs tend to serve proportionally more substance abusers than external programs.

⁷There were 224 responses obtained from the 1,000 CEOs who were surveyed.

⁸The survey response rate was 53 percent for employees who had given signed permission to be surveyed. An unknown percentage of employees who withheld permission were not surveyed.

⁹Results are expected soon from a multiple-year study of alcohol abusers coming to an EAP who were randomly assigned to one of three programs: hospitalization followed by Alcoholics Anonymous (AA), AA only, or the client's treatment of choice. That study will shed light on the value of inpatient hospital treatment, a very expensive component of substance abuse treatment.

¹⁰An evaluation by Ahn and Karris (1989) of the EAP at the University of Maine presents a detailed discussion of improving accuracy by estimating savings according to salary levels and severity of clients' problems.

¹¹The sample size decreased from 111 in the base year to 40 in the last follow up year.

NOTES

¹The Institute for a Drug-Free Workplace, a coalition of private companies recently created to address workplace drug abuse, is affiliated with the U.S. Chamber of Commerce.

Table 1. Percentages of public sector EAPs providing various services ($n = 275$)

Service	Percentage of EAPs offering that service
Referrals	99
Short-term counseling	93
Ongoing EAP promotion	88
Management consultations	88
Diagnostic assessment	86
Statistical information	85
Followup services	85
Crisis intervention	84
EAP monitoring and evaluation	84
Educational seminars	80
Policy and procedure development	75
Employee orientation	69
24-hour crisis line	67
Return-to-work services	65
Quality assurance	62
Union consultations	55
Outpatient treatment	47
Wellness program	44
Brief psychotherapy	41
Volunteer peer support program	27
Inpatient treatment	23
Extended psychotherapy	22
Other	13

Source: Quinn (1989).

Table 2. Major components of EAPs and managed care

EAP	Managed care service
Policy and procedure development	Benefits design
Referral resource development	Preferred provider development
Assessment	Preauthorization
Referral	Referral
Followup	Utilization review
Reporting	Reporting
Evaluation	Evaluation
Program promotion	Program promotion
Supervisor and union representative training	
Organizational consulting	

Source: Parker (1989).

Table 3. Percentages of EAPs measuring factors in relation to EAP use

Factor	Percentage of EAPs
Program utilization	53
Referral effectiveness	37
Treatment outcomes	34
Recovery rates	26
Absences	26
Tardiness	23
Use of health insurance or workers' compensation	21
Turnover	14
Quality of work (errors)	13
Productivity	12
Accident or injury rate	11
Grievances or arbitrations	9
Hiring and training costs	8
Property damage	7
Overtime costs	5
Other	2

Source: Quinn (1989).

Table 4. Utilization measures of three EAPs, by type of problem

Measure	External broadbrush programs (N = 2,288) (percent)	Manufacturing company (N = 2,597) (percent)	Transportation company (N = 1,673) (percent)
Client drug use	8 ^a	1	8
Client alcohol use	--	9	42
Family drug use	9 ^a	1	3
Family alcohol use	--	14	10
Emotional and mental health	17	26	11
Marital	23	31 ^a	10
Family relationships	13		4
Financial	5	2	3
Legal	7	2	2
Educational and occupational	2	7	3
Health	1	2	1
Other	15	5	3
Annual utilization rate^b	5.3	8.0	3.2

Source: Jones (1987).

^a Combined categories.

^b Annual utilization rate = number of EAP client families / number of eligible employees.

Table 5. Referrals to community resources in three EAFs

Community resources	External broadbrush programs (N = 2,288) (percent)	Manufacturing company (N = 2,597) (percent)	Transportation company (N = 1,673) (percent)
Inpatient/hospital	2	7	35
Outpatient program	10	5	7
Individual, family, or group therapy	35	29	26
Self-help group	8	17	15
Legal counseling	11	4	2
Financial counseling	6	1	2
EAP clinical counseling	--	62	--
Further EAP assessment	32 ^a	4	4
Other	11	13	8

Source: Jones (1987).

^a These are telephone callers recommended to visit in person.

Note: Clients can receive more than one referral, making totals exceed 100 percent.

Table 6. Job performance changes documented for the Burlington Northern Railroad EAP

Indicator (previous month)	At intake (percent)	At 3-month followup (percent)	At 12-month followup (percent)
Used health insurance	17	8	5
Arrived late for work	17	5	3
Left work early	13	4	3
Took sick days	18	7	8
Used medical leave	4	7	4
Job in jeopardy	25	7	4

Source: Coyne (1987).

DEFINING THE PUBLIC INTEREST IN WORKPLACE DRUG ABUSE POLICY

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Policy toward drug abuse is being developed and implemented in the private as well as the public sector. Firms in the private sector are responding to the adverse effects of drug abuse on productivity and compensation costs. The 1988 National Household Survey on Drug Abuse, conducted by the National Institute on Drug Abuse (NIDA), indicated that 22 percent of 20- to 40-year-old full-time employed Americans used an illicit drug in the past year and 12 percent used one in the past month. Among young adults aged 18-25--the group making up new workers--32 percent used an illicit drug in the past year and 18 percent used one in the past month. A longitudinal study of preemployment testing conducted by the U.S. Postal Service in 1988 indicated that 9.4 percent of all applicants and 8.4 percent of all new hires tested positively for drugs (U.S. Postal Service 1989).

The economic cost of drug abuse in 1988 was estimated to be \$58.3 billion, with \$7.2 billion of the loss attributable to reduced productivity (Rice et al. 1990). In a 1988 national survey of chief executive officers (CEOs), human resource executives, governors, and mayors, four-fifths of the study's respondents found alcohol and drug abuse to be a "significant" or "very significant" problem in their workplace (Mercer Meidinger Hansen, Inc. [MMH] 1988). In Executive Order 12564 of September 15, 1986, establishing the Federal policy of a "Drug-Free Workplace," President Reagan stressed the role of the Federal Government as an employer as well as a regulator of other employers' policies.

The view that the workplace is an appropriate place to address individual substance abuse is generally accepted (Walsh 1989). In 1986, NIDA sponsored a consensus development conference where representatives from law, business, industry, and labor met to develop recommendations and guidelines for establishing fair and reasonable workplace drug abuse policies and programs. Panels concerning health and safety, legal and security, and human relations issues drafted consensus statements. Several recommendations from these statements are pertinent to the following discussion of the public interest in the decisionmaking of private firms regarding drug abuse policy and are included for reference in appendix A. These consensus statements suggest that, although safety for the employee and his or her co-workers should be paramount in the firm's establishment of drug abuse policies, employers should be encouraged to facilitate a drug-abusing employee's receipt of treatment and allow for the employee's reinstatement following successful treatment. This perspective has also been articulated by Walsh:

...[T]he basic purpose for any drug policy should be to get the substance-abusing employee the help that is needed and to get him back on the job. It would seem to be in the national interest to rehabilitate those who can be helped not only for humanitarian reasons but to conserve and maximize the nation's human resources. (Walsh 1989, p. 170)

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In actuality, private employers have adopted a wide range of policies toward drug abuse. On one end are "model" programs at some large employers such as IBM, which combine preemployment testing, regular testing of employees in certain jobs, retesting in conjunction with medical reviews

triggered by performance inadequacies, employee assistance programs (EAPs), and extensive health insurance coverage. At the other extreme are firms that ignore special issues associated with drug abuse or whose programs are oriented mainly toward punitive action against offenders. Walsh and Gust (1986) note the extreme diversity that exists in current workplace policies and the need to encourage employers to develop more comprehensive policies that include taking a financial responsibility for costs of treatment.

We regard the basic public policy issue in workplace drug abuse policy to be how best to harness the natural private concern with productivity and costs of compensation so as to serve the public interest in reducing the social costs of drug abuse. It must be recognized that private and social interests sometimes, but not always, coincide. A firm or other employer has an incentive to identify drug-abusing employees and to help them combat drug abuse. An EAP, for example, may reduce productivity losses and health insurance costs and thus may represent a cost-effective component of workplace drug abuse policy. The public interest is furthered by such private initiatives, and the appropriate public policy may be to encourage employers to adopt effective program models.

In other cases, however, the interests of the employer and the public interest may diverge. Drug testing associated with sanctions such as dismissal has a deterrent effect that supports public policy by discouraging drug use; however, it also contains a pass-the-buck element, which may not be socially beneficial (and is even potentially harmful). If a discharged worker becomes uninsured but continues to require treatment, one "benefit" to the employer of the testing program -- reduced health insurance expenditures -- may simply correspond to higher costs at a publicly supported facility.

The main purpose of this paper is to pursue the congruence and incongruence of private and public interests in workplace drug abuse policies. We draw a distinction between policies that are

intended to alter behavior of drug abusers and those that are intended to shift the costs of drug abuse to other parties. In general, private and public interests are congruent when private policies alter behavior in constructive ways. Incongruence typically exists when private policies are designed to save an employer money by shifting the costs of drug abuse.

The following section of this paper reviews information about workplace drug abuse policies in three areas: EAPs, insurance coverage, and drug testing or sanctions. Divergence between private and public interests can be significant in the case of private decisions about insurance coverage and testing or sanctions. This argument is made in the third section. A classification of workplace drug abuse policies into those that alter behavior and those that shift costs is not possible, however, without considering the nature of the labor market. The immediate effect of dismissing a worker for drug abuse may be to shift costs, but a deterrent effect may also be introduced into the labor market. The fourth section begins to consider the labor market issues involved in an evaluation of workplace drug abuse policies. We discuss these considerations because we expect to incorporate some of them into our future research.

TRENDS IN WORKPLACE DRUG ABUSE POLICY

This section focuses largely on recent surveys providing comparative information on employers' health insurance benefits and drug-testing programs. Only a brief discussion of EAPs is included here, given that this aspect of workplace drug abuse policy is explored in detail in Tompkins in this volume.

EAPs

EAPs take a myriad of forms in today's workplace. They can play an integral role in a firm's approach to drug abuse, offering education and prevention,

drug usage screening and monitoring, in-house counseling, and referral for treatment. In addition, they can strengthen a firm's pro-labor record in the face of legal suits engendered by drug-testing policies. EAPS are generally viewed as having tremendous potential to assist drug-abusing workers (Masi 1989). Only larger companies, however, tend to have the financial wherewithal and interest to develop such programs (Ozga 1989). The 1988 Bureau of Labor Statistics (BLS) *Survey of Employer Anti-Drug Programs* (U.S. Department of Labor 1989b) found the most important determinant of the presence of an EAP to be the number of employees in an establishment. But cost-effective evaluation models of EAPS generally appear to be lacking, leaving unanswered the question of the comparative cost savings of dismissing an employee versus referring the individual to an EAP (Decker et al. 1986).

Health Insurance Coverage

Data reported here on work-based health insurance benefits for drug abuse come from BLS surveys as well as from privately conducted surveys of private industry. The BLS' Employee Benefits Survey (EBS) (U.S. Department of Labor 1989a) is the only nationally representative random sample survey that has investigated group health insurance coverage for drug abuse offered by private, nonagricultural medium- and large-sized U.S. establishments. The 1988 survey was expanded to include a larger percentage of service workers and workers in smaller firms than were in previous years' surveys.

Private health insurance coverage for drug abuse is now a common feature of health insurance plans for full-time U.S. workers. BLS surveys have documented a rapid increase over the past decade in the addition of such coverage to health insurance benefits offered by U.S. employers. In 1983, 43 percent of full-time workers in medium- and large-sized firms had drug abuse benefits (Morrissey and Jensen 1988); in 1985, 61 percent had such coverage. By 1988, 90 percent of all

full-time workers had health insurance, and 74 percent had drug abuse coverage (BLS 1989b).

Establishment size is the main determinant of drug abuse coverage, with firms employing 2,500 or more workers being most likely to provide such coverage. In addition, in 1985, establishments in the Western United States were most likely to offer coverage, whereas those in the South were least likely to do so. The transportation industry offered drug abuse coverage to the highest proportion of employees (75.5 percent), and the wholesale trade industry covered the lowest proportion (44.1 percent). Workers with self-insurance plans were only slightly less likely (4 percentage points) to have drug abuse coverage than other employees (56.4 percent).

Drug abuse coverage is typically subject to cost limits and rarely comparable to coverage for other illnesses. Data for 1988 indicate that, among individuals with drug abuse coverage, only 4 percent had their treatment costs covered in full. Nineteen percent had drug abuse coverage that was subject to internal limits only (i.e., a deductible or copayment placed on an individual category of care, such as hospitalization), 3 percent were subject to overall limits only (i.e., a limit on the total drug abuse benefit), and 48 percent were subject to both internal and overall limits. Of all individuals with some drug abuse treatment benefits, 96 percent were covered for inpatient detoxification, 77 percent for inpatient rehabilitation, and 81 percent for outpatient care.

Coverage for drug abuse treatment shows some variation across the three categories of workers surveyed, with production and service workers being slightly less likely to have coverage than professional and administrative workers or technical and clerical workers. Production and service workers were also slightly less likely to be covered for inpatient care and slightly more likely to have both internal and overall limits.

A health care benefits survey of 1,600 employers conducted by a benefits research firm found that, with regard to substance abuse coverage (drug

abuse was not specifically investigated), limitation of benefits and preemployment substance abuse screening were more typical than utilization review (UR) cost management techniques (A. Foster Higgins, Inc. 1988, pp. 19-20). Substance abuse coverage was managed separately from mental health care coverage in approximately half the plans surveyed, and 88 percent of employers placed some type of limit on inpatient treatment for substance abuse. It was common for firms to limit coverage and to do so in more than one way: 56 percent limited the number of days per inpatient episode (the most common number of days was 30); 48 percent limited the total number of inpatient episodes per year or per lifetime (the most common number of episodes was 2); 30 percent limited the amount payable per lifetime; and 23 percent limited the amount payable per year.

The aforementioned survey of all state governors, the mayors of 64 of the largest U.S. cities, and the CEOs of Fortune 1000 companies ($N = 265$), as well as in a companion survey of the human resource executives of these same organizations, provides insight into employer behavior regarding drug abuse-related health insurance and health costs, although drug abuse is not disaggregated from substance abuse in this research, either (MMH 1988). A major finding of this survey is that companies do not take advantage of state-of-the-art health cost management techniques and resources, nor do they document the results of their substance abuse efforts.

Only about one-third of employers surveyed reported monitoring health insurance claims; one-quarter had preferred provider arrangements with substance abuse treatment facilities; and only one-third of preferred provider organizations assumed any risk for performance or guaranteed cost savings to employers as a result of utilization management. Only one-third used UR to manage substance abuse treatment costs; of those, approximately four-fifths used the same organization reviewing their regular medical utilization. One-half of the human resource executives surveyed had not requested UR groups

or claims payers to disaggregate substance abuse claims from other medical claims.

Health maintenance organizations (HMOs) generally do not cover substance abuse treatment on a par with other treatment. Results from a 1986 national survey of mental health and substance abuse services within HMOs indicate that, although two-thirds of the HMOs surveyed offered alcohol and drug abuse benefits (Levin et al. 1988), 31 percent offered only detoxification and emergency drug abuse coverage. The median benefits for alcohol and substance abuse coverage were 20 outpatient visits and 30 inpatient days. Forty-eight percent of these HMOs also offered multiple or supplemental alcohol or substance abuse benefits.

Drug Testing

The other major component of workplace substance abuse policy is drug testing. In response to growing concerns about public safety and the economic effects of substance abuse on productivity, drug testing by urinalysis has increasingly been used on job applicants and employees in workplaces throughout the country. Drug testing is conducted under one or more of the following circumstances: (1) prior to an individual's employment or during a probationary period; (2) when an employee is under reasonable suspicion of drug abuse, such as after an accident; (3) during routine physicals, typically required by Federal guidelines; (4) as part of random testing; and (5) while monitoring an employee during rehabilitation or treatment for drug abuse (Willette 1989).

Several recent surveys provide data on the status of industry drug-testing programs. Although these surveys differ significantly in sample size, populations studied, and focus, they provide a useful overview of the nature and prevalence of drug-testing programs in American workplaces. The BLS *Survey of Employer Anti-Drug Programs* (BLS 1988b), a national probability sample of private, nonagricultural establishments with one or more workers ($N = 7,502$), indicates that the

presence of a drug-testing program is strongly associated with the establishment's size. Sixty percent of establishments with 5,000 or more employees and 43 percent with 1,000 or more employees had drug-testing programs, but only 2 percent of those with fewer than 10 workers had such programs. Because small workplaces make up over 90 percent of workplaces, only 3 percent of all workplaces surveyed had drug-testing programs, and only approximately 20 percent of all employees represented by the survey worked in establishments with drug-testing programs.

Twenty-six percent of workplaces with employee testing had programs in which all workers were eligible for testing; 64 percent had programs that only tested workers suspected of drug use, and 15 percent had programs that tested persons in specific jobs (some workplaces had more than one program) (BLS 1989b). Most workplaces testing applicants had policies in which all applicants were eligible for testing; only 16 percent restricted their testing to applicants for specific jobs. However, only 1 million employees and nearly 4 million job applicants were tested in the year preceding the survey, with approximately 9 percent and 12 percent, respectively, testing positive for drugs.

In part because of Federal regulations requiring drug testing, firms in mining, communications, public utilities, and transportation were most likely to test for drugs. Manufacturing firms, which tend to be large, were also more likely to test for drugs. Retail trade, services, and construction companies were least likely to test. State legislation restricting drug testing had a small effect and geographic region had a very small effect on the likelihood of having a drug-testing program. Four percent of workplaces without programs were considering implementing one within the next year. Again, workplace size was the main determinant of such a plan.

The Gallup Organization (1988) conducted the first statistically representative survey of drug-testing programs in U.S. companies, surveying 706 companies with and 312 companies without such programs. Firms surveyed came from heavy

manufacturing, transportation, utilities, and "other" industries. Sixty-eight percent of large companies (500 or more workers) with testing programs reported having handled employee drug abuse incidents in the previous year.

Twenty-eight percent of companies surveyed with more than 5,000 employees, 13 percent with 1,501-5,000 employees, and 10 percent with 500-1,500 employees had drug-testing programs. Forty-nine percent of large utility companies, 44 percent of large transportation companies, 18 percent of large heavy manufacturing companies, and 9 percent of large companies in the remaining industries had testing programs. Protection of a company's safe work record and reduction of worksite accidents were the primary reason cited for instituting a drug-testing program (54 percent); 14 percent of large companies without a drug-testing program said they planned to implement one within the year, citing these same reasons for the decision. Twelve percent of companies not planning a program within the year planned to implement one at some point in the future.

The Gallup survey also found that 63 percent of all large companies with drug-testing programs tested their employees. Of these, 23 percent tested all their employees. Among those companies that tested only some employees, 43 percent said they tested "for cause." Eighty-six percent of large companies with testing programs tested job applicants, and 81 percent of these companies tested all applicants. Among all large companies with drug-testing programs, 67 percent tested "for cause" and 26 percent conducted on-site testing.

In the opinion of the Gallup survey respondents, drug-testing programs had a positive impact. Among large companies with testing programs, 26 percent reported having higher quality job candidates, 23 percent reported fewer preemployment positive tests, 15 percent reported fewer accidents, and 14 percent reported increased productivity as a result of their program. However, these data appear to be impressionistic and are not supported by careful evaluation.

Virtually all respondents reported that they were unable to estimate the financial savings resulting from their testing program.

Regarding actions taken by companies in response to positive tests, 86 percent of the companies that only tested job applicants stated that they would not hire an applicant who tested positive, and 12 percent reported referring the applicant to counseling or rehabilitation. In companies that only tested employees, 78 percent reported referring an employee to counseling or rehabilitation, 26 percent reported using dismissal, and 22 reported acting on a case-by-case basis. Warnings and suspensions were infrequently used, and reassignments appear never to have been used. In companies having both preemployment and employee testing, 58 percent reported not hiring applicants with positive results, 50 percent reported employee referral to counseling/ rehabilitation, 22 percent reported employee dismissal, and 16 percent reported action on a case-by-case basis.

In the previously described national survey of Fortune 1000 CEOs, human resource executives, governors, and mayors, the presence of preemployment and employee drug-testing programs was reported by about one-half and one-third, respectively, of all respondents (MMH 1988). Approximately one-quarter of the respondents were in favor of random, on-site testing of workers in usual business circumstances, and four-fifths favored random testing for workers whose job tasks might jeopardize the safety of others.

Summary

In summary, about three-quarters of all full-time U.S. workers have health insurance plans providing drug abuse coverage. Workplace size is the main determinant of such coverage. Drug abuse coverage is generally subject to greater restrictions than coverage for other illnesses. Private surveys suggest that firms typically do not use sophisticated health cost management techniques in response to

drug abuse health costs and instead respond to increasing costs by restricting coverage.

Firm size and industry type are the main factors determining the presence of a drug-testing program. Data from the 1988 BLS EBS survey indicate that about one-fifth of all private nonfarm workers worked in firms with drug-testing programs. Most workplaces with preemployment testing programs tested all applicants and did not hire someone who tested positive. Most employee testing programs were limited to workers suspected of drug use, with fewer than one-tenth of workers in companies with programs actually being tested. Private survey data indicate that about one-half of the employers refer an employee testing positive for counseling or rehabilitation and that about one-quarter dismiss the employee.

PUBLIC AND PRIVATE INTERESTS IN HEALTH INSURANCE COVERAGE AND WORKPLACE DRUG TESTING

Health Insurance

It has been recognized for some time that private and social interests can diverge in the choice of insurance coverage, specifically in the coverage for substance abuse and mental health services (McGuire 1981). An employer may not offer certain coverage because its presence may attract "bad risks" for chronic illnesses or foreseeable conditions (such as pregnancy) that would increase health insurance costs. This is the problem of "adverse selection" in health insurance. High-risk employees may choose employment on the basis of insurance coverage, or working spouses may elect the family plan with better coverage instead of their own plan through work. Drug abuse conditions are chronic, and users are likely to be able to foresee their own service needs with some degree of accuracy.

From a social point of view, however, adverse selection does not create high costs or high-risk enrollees; it merely influences who pays for their

care. In pursuit of shelter from high-cost users, plans vulnerable to selection effects may reduce otherwise beneficial coverage below efficient levels. The argument for State mandates for mental health coverage is based on this selection effect and on the divergence between public and private interests (McGuire and Montgomery 1982; Frank 1989). A similar argument applies to drug abuse coverage. Regulation can reduce socially wasteful competition for good risks by specifying a minimum level of coverage to be offered by all plans.

Drug Testing

In this section, we consider workplace policy with respect to drug testing. Firms may utilize drug testing programs to identify and begin treating drug abusers. Testing programs can also deter illicit drug use. In these cases, public and private interests coincide. As illustrated by the particular case analyzed below, however, public and private interests can also diverge. In a recent report to NIDA, Southern Electric International (SEI) describes the results of a cost-benefit analysis of a workplace drug-testing program at Georgia Power Company (SEI 1989). SEI concludes that "the net effect of discharging 198 drug users during the period 1983 to 1987 was a gain to Georgia Power of about \$294,000 to \$2,810,000, an excess of benefits over costs of 18 to 195 percent" (p. 1). SEI makes a number of specific assumptions about training costs, future medical costs, and other factors, which are not questioned here.¹ We review this study of workplace testing to point up the discrepancy that can exist between the benefits to the employer and the benefits to society at large. What can be a good policy from the employer's perspective can be inefficient from the wider societal viewpoint. The SEI study is currently in a preliminary form and (at the time of this writing) has not yet been accepted in final form by NIDA. The comments contained here are therefore based on a preliminary version of the report. However, although there will likely be some changes in the final document from SEI, our points about the social and private interests in testing will be largely unchanged.

Georgia Power's drug-testing program includes preemployment testing, routine testing of security and nuclear power workers, and "for-cause" testing of all employees. Current employees testing positive are discharged. The 198 employees SEI studied were the subject of the cost-benefit analysis.

Table 1 summarizes the present discounted value of the costs and benefits to drug testing contained in the report. SEI estimates benefits in three areas: reduced health insurance claim costs, reduced compensation for time lost from work, and reduced workers' compensation claims. Average annual health insurance claims were \$1,377 for discharged workers compared with \$163 for controls, a difference of \$1,214 per year. Compensated lost time for discharged workers was \$400 above controls. Workers' compensation payments exceeded those for controls by \$119. To calculate the present discounted value of these annual figures, SEI assumed (based on their recent experience) that medical claim costs would rise 19.9 percent, that wage increases (to value time lost) would rise 3.5 percent per year, and that worker's compensation claims (largely made up of health care costs) would rise at the same rate as medical costs. These increase figures were used to set the upper range for benefits; the lower range was generated by assuming no nominal increases. SEI chose a (very high) discount rate of 10 percent and assumed the average duration of employment for discharged workers would have been 8.4 years.² The total figure in table 1 is less than the number SEI reports (see their appendix A) because the SEI report erroneously counts a full year of benefits for the ninth year after discharge. (Only 8.4 years should have been used; see footnote 5.)

The costs of a drug-testing program were identified in three areas: costs of training, recruitment, and temporary lost productivity due to turnover; litigation costs due to legal challenges; and costs of administering the tests themselves. All these costs were viewed as being incurred in the base year and hence involved no projections or discounting. Turnover costs differ considerably by job. The average estimate used in the report was \$5,643 to

\$6,087, depending on the allocation of some joint costs. We report the lower figure. Litigation costs averaged \$748 per discharge, and costs of testing (at \$45 per test) were between \$204 and \$279 per discharged worker. Again, we use the lower figure. Our total cost number differs from that in the SEI report (p. 46) because, in calculating testing costs, SEI appears to have mistakenly substituted the number of tests for the average cost of the tests per discharged worker.

From the perspective of Georgia Power, the benefits of the program exceed the costs by nearly \$13,000 per discharged worker, as table 1 shows. We now turn to the question of whether, from a broader policy perspective, the testing program at Georgia Power has greater benefits than costs.

From the broader social point of view, a drug-testing program does not provide any benefits if the health care costs are shifted from one payer to another. The "excess medical insurance claims" with a present value of \$15,599 are the major benefit to Georgia Power of the testing program. Are these costs saved in terms of the wider perspective? The answer depends on what happens to the drug abusing workers after they are discharged. In other words, what is the effect of the testing program on other social organizations? If these individuals simply get another job but continue to incur extra medical expenses, there is no social saving. If they spend a period of time unemployed and pay for health care out-of-pocket or are financed through public or other private funds, there is also no social saving. If they need health care but do not receive it because of difficulties in paying, a social cost appears in the form of lost benefits from useful treatment.

The only circumstance under which these savings to Georgia Power would correspond to social savings is if the experience of dismissal caused the former employee to stop abusing drugs. This seems unlikely enough for us to answer the question of whether this is a social benefit with a "no" (see table 1). We are not aware of research that investigates how dismissal "for cause" affects individuals' abuse of drugs. It seems possible that

the effect could be detrimental rather than constructive.³ This effect is a component of the incentive effect of drug-testing programs that we believe should attract research attention.

Compensated lost time and workers' compensation payments may or may not correspond to social savings, depending again on what happens to the workers after discharge. If dismissal leads to recovery, these are social savings. If not, then from the broader perspective, neither the lost time nor the medical costs associated with compensation claims will be saved. The same behaviors leading to these costs at Georgia Power will occur in another setting.

All the costs of the drug-testing program, on the other hand, represent social costs. Resources are used to administer the tests, deal with legal issues, and retrain workers. Although Georgia Power finds these costs to be more than offset by reductions in other labor costs, society is, in total, worse off unless dismissal or threats of dismissal produce significant incentive effects. More generally, this highlights the importance of using drug testing programs as part of a comprehensive program aimed at deterring use and providing treatment to identified drug users.

LABOR MARKET ISSUES

The basic framework, presented in the previous section, emphasizes the distinction between workplace policies that *reduce* costs related to drug abuse and those that *transfer* costs from the private to public sector, or to some other private sector establishment if the employee is hired by another firm. Policies with a treatment component are likely to have important incentive effects, whereas drug-testing/sanction programs mainly shift costs.

In this section we consider several issues that, in some cases, alter these conclusions. These additional complications should be viewed as illustrative rather than conclusive and suggest important areas for future research. What is most

salient, however, is that neither the basic distinction between incentive and selection effects nor the specific concerns that might have bearing in particular cases have received adequate attention in the public and private debate on appropriate workplace drug abuse policies.

The discussion below focuses on two types of issues. The first relates to employee/employer responses to drug abuse policies, including deterrence effects of testing and sanctions, worker incentives to conceal abuse, and inadequate incentives for firms to limit abuse. The second category involves consequences of drug abuse policies that extend beyond the worker or firm and include variations in costs of drug abuse across jobs, longer term employability of workers, and policies toward dependents of employees. Each example is considered briefly in turn.

Deterrence

Firms with strict drug-testing programs and punitive sanctions for drug abuse are likely to attract employees with low propensities for drug use. This selection effect is likely to result in cost shifting, either to employers with less stringent sanctions or to the public sector. An additional effect of sanctions, however, may be to deter workers from using drugs.⁴ To the extent that deterrence occurs, the testing and sanctions are likely to reduce total costs associated with drug abuse and be in the public interest. The ability of the efforts to deter abuse is likely to depend on a variety of factors. Perhaps most important is the degree to which drug abuse is under the control of the potential abuser.

In considering this question, we can consider two extreme models of drug abuse. The first is a purely medical or *disease model*, in which all individuals have randomly determined (although possibly unequal) probabilities of becoming users and no ability (in the absence of treatment) to influence this probability. If workers have some knowledge of their propensities for abuse (e.g., children of alcoholics know they are at a

higher-than-average risk of becoming alcoholic themselves), high-risk individuals will self-select out of firms with strict testing/sanction policies. In this case, the sanctions have a pure selection effect and may conflict with the public interest.

At the opposite extreme is a pure *behavioral model* of drug abuse, in which, all individuals have substantial ability to influence actual outcomes through the behaviors they choose. In this situation, sanction/testing programs can have substantial deterrence effects in cases in which the jobs that include them are desirable because they offer high wages, good working conditions, etc. This is also the situation in which legal/criminal sanctions may have the greatest benefit for society.

The actual model of drug abuse is likely to lie between these two extremes. Some individuals may be able to influence their probability of initiating or stopping drug abuse while others may be more strongly affected by physiological or genetic factors. An important area of research is the degree to which workplace policies deter drug abuse.

Incentives To Conceal Drug Abuse

In addition to desirable deterrence effects and undesirable cost shifting, drug testing and sanctions can provide incentives for workers to conceal drug abuse. This occurs because, by hiding the abuse, workers can avoid economic and possibly criminal penalties. Two social problems result from this behavior. First, treatment is not obtained until later stages of abuse, when it is likely to be more expensive and less successful. Second, individuals, firms, or society may incur costs during the period in which abuse is being concealed.

This problem is analogous to the common dilemma in health insurance whereby large deductibles and copayments reduce moral hazard⁵ but cause some individuals to postpone care inappropriately. The incentive problem may be overcome or at least partially mitigated in the case of drug abuse, however, when specifically structured sanctions are

combined with treatment programs. The key characteristic of such a combination program is that penalties are lower (or absent) if the individual voluntarily reveals the abuse problem and enters treatment than if use is discovered through testing. Interestingly, there are some drug sanction/treatment programs that are structured in this way; for instance, the National Basketball Association has reduced sanctions for athletes who admit drug problems and enter treatment.

Inadequate Incentives for Firms To Limit Drug Abuse

We have assumed that firms have strong incentives to limit the drug abuse of their employees. Although this is generally the case, given that employers often bear substantial costs in the form of lower productivity, there may be circumstances in which companies have inadequate incentives to limit drug abuse.

One such circumstance occurs when important costs are not borne by the firm. In a general sense, this includes all costs occurring outside the workplace. For instance, if an abuser is involved in an auto accident, the firm bears only a small expense in the form of lost work time, but the costs to society are much greater. If company-based treatment and sanction programs could have prevented the accident more cheaply than publicly provided assistance, the firm underprovides services by failing to take the externality⁶ into account. When externalities are important, Government subsidies or tax incentives for company-provided prevention efforts may be desired.

In extreme circumstances, employers may virtually encourage drug abuse in conflict with the public interest. One example is the National Football League's (NFL) policy toward anabolic steroids. Although it has tested for a variety of illegal drugs for several years, the NFL has only recently agreed to begin to test and sanction the use of steroids. In the context of the above discussion, steroid use has negative externalities in the form of long-term

health problems for athletes and the bad example these "role models" set for younger persons who are more likely to begin using drugs. Because most football players stay in the NFL for only a few years, the employers bear just a small fraction of the health costs and none of the costs associated with increased abuse among amateur athletes. The use of steroids may actually benefit the football teams because players using them can gain strength and weight faster than their drug-free counterparts.

Job-Matching Effects

The selection effects associated with drug testing/sanction programs may have the detrimental effect of shifting costs from employers to the public sector. In some cases, however, it is desirable to select workers out of particular types of jobs. To see this, imagine that there is one set of jobs for which drug abuse has a substantial cost (e.g., airline pilots) and another set for which relatively few costs are associated with drug abuse (e.g., fast-food workers). The economically efficient allocation of labor would result in persons with low probabilities of drug abuse working in the first sector and those with high probabilities employed in the second. This suggests that strict testing/sanction effects may be justified for those jobs in which drug abuse results in high productivity losses but not for those in which costs are relatively low. To some extent this is *implicitly* recognized in the debate over the efficacy of testing/sanctions; for instance, strict penalties are often advocated for transportation workers.

Differential costs of drug abuse also have implications for treatment. Workers frequently possess skills that are specific to their industry or occupation. Thus, all else being equal, they are more productive in these jobs than other persons. For example, an individual who has earned an MBA and worked for 10 years in a managerial capacity is likely to be better at this sort of job than a random job applicant. Similarly, doctors, construction workers, and electricians possess substantial skills that are specific to their

occupations. In these cases, large productivity losses are likely to occur if strict penalties for drug abuse result in abusers' being forced to change jobs, industries, or occupations.

A better solution is likely to involve a coordinated program of sanctions and treatment, in which incentives encourage abusers to enter treatment and, conditional on acceptable outcomes, allow them to continue working in the sector in which they have specific skills. The particulars of such programs obviously depend on the specific job and potential costs of drug abuse. For instance, the conditions under which a doctor or an airline pilot will be allowed to continue or resume employment are likely to be more rigid than those for occupations with lower damage potential. However, even when a surgeon is barred from operating, there may be less risky jobs for which his or her experience is useful and in which the surgeon is qualified to work.

Longer Term Employability

Employer drug abuse policies can have lasting indirect effects on workers. Of particular importance are the effects of workplace drug policies on longer term employability. There is now substantial evidence (e.g., Ellwood 1982) indicating that youths with substantial early employment experience work more and receive higher wages later in life. This suggests that employer policies resulting in the dismissal of young drug abusers are likely to jeopardize these youths' future employment prospects. In addition, such policies may ultimately engender large costs to society. Although the evidence for adults is less clear, there is some indication of persistent negative effects of dismissals on a large percentage of terminated workers (Ruhm 1990). To the extent that these lasting employment effects are important, sanctions have a negative externality and treatment has an additional social benefit. This again argues for Government policies that encourage treatment and discourage sanctions.

Coverage of Dependents

Firms frequently pay a portion of the health insurance premiums of dependents as well as of the employees themselves. However, rapidly rising health insurance costs, and skyrocketing drug abuse treatment costs in particular, suggest that firms will be reevaluating their role in subsidizing the cost of health insurance for their employees' dependents. This trend has been documented by a recent survey conducted by the Northwestern National Life Insurance Company, which found that 90 percent of the 400 executives surveyed planned to limit dependent coverage in the next decade (Ham 1989). Employer policies toward dependent coverage have a number of important public policy implications. However, discussing these issues in any detail is well beyond the scope of this review, and we limit ourselves to mentioning a number of alternative policies, with a brief discussion of possible concerns.

Companies could choose to provide comprehensive drug abuse coverage to their employees but much less extensive insurance (e.g., higher deductibles or copayments) or no insurance at all to dependents. This would have two effects. First, treatment costs for employees' dependents might be transferred to the public sector. Second, workers with high-risk dependents would select employers offering superior coverage. This would result in the standard adverse selection problem, which has been widely discussed in the health insurance literature.

As an alternative, employers could attempt to screen out job applicants with at-risk dependents. This would likely be more difficult than screening the job applicants themselves (i.e., employers would probably not be able to drug test entire families). The result may be subtle and insidious forms of discrimination. For instance, companies may be less likely to hire job applicants with families. This bias would be especially pronounced for applicants with adolescent children and even more so for applicants who are members of high-risk groups.

The issue of dependent coverage will require extensive study. It is premature even to speculate about policy implications without a much better understanding of current and anticipated future employer practices.

DIRECTIONS FOR FUTURE RESEARCH

The basic point made in this paper is that the interest of the workplace is not the same as the public interest in adopting a program toward workplace drug abuse. We have chosen to emphasize in this discussion the incentives of a firm or other private employer to shift costs. When costs are simply shifted, as when a drug-abusing worker is discharged and that worker's health costs become the responsibility of the local public sector, private savings that result from this behavior do not correspond to social savings. As we pointed out in the previous section, the effects of workplace policy on behavioral change and on cost shifting are often not clear-cut, but depend on the nature of the firm, the industry, and the labor market. One important goal for research is to continue to develop the perspective of private and public interest in workplace policy, helping to clarify the areas of congruence and incongruence.⁷

As our review of workplace policies makes clear, there is great variation in all three major dimensions of those policies (EAPs, health insurance, and testing/sanctions), but there are also some interesting regularities, such as the tendency of large firms in certain industries to adopt certain policies. This suggests that a large program of research is needed to investigate the determinants of workplace policies. Some such work has already taken place in the area of health insurance, but much remains to be done. Why do large firms more regularly appear to adopt EAPs, for example? Can a simple economy-of-scale argument suffice?

As evaluations of workplace programs (e.g., SEI 1989) accumulate, it will be increasingly important to keep both the public and private perspectives in mind in considering the implications of the research

reports. We suggest that researchers address the nature of program costs and benefits from the point of view of the workplace and larger groups. Our review of the SEI report suggests that what might be privately beneficial could be harmful from a broader perspective. This issue turns on the question of the impact of workplace policies on undesirable behavior. Research on the effect of sanctions and testing on drug use needs to supplement the attention paid to the effects of other workplace policies, such as EAPs and treatment, on undesirable behavior. Firms set insurance coverage; they do not directly determine who gets treatment. The demand for drug abuse treatment, together with the role of workplace policy in influencing that demand, is another large and important area for research.

Finally, our discussion in the previous section pointed up a number of considerations relevant to a social evaluation of workplace policies. We believe it is worthwhile to develop explicit conceptions or models of the labor market that might allow us to draw more conclusions about the likely effects of combinations of workplace policies toward drug abuse.

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APPENDIX A

CONSENSUS STATEMENTS

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General Consensus Statement on Drug Abuse in the Workplace

III. Drug abuse policy should be developed according to the best available current knowledge about abuse and its consequences....Employers should become involved in the early identification, treatment, and follow-up of employees with drug abuse problems.

Health and Safety Issues Consensus Statement

2. What questions or issues should be addressed when developing a preemployment screening program?... Companies should inform applicants when the reason they are not hired is a confirmed drug presence in urine. When applicants are informed of a positive drug screen, the company should provide some level of counseling or information to the applicant regarding risks involved in drug abuse.
3. What questions or issues should be addressed when drug screens are proposed for in-service employees?... When an employee's drug screen is positive, rehabilitative help should be offered. However, safety and security considerations for the employee and his or her fellow workers are a first priority and must take precedence over other considerations....

If an employee whose job involves safety and security concerns refuses rehabilitation, management must be informed and appropriate administrative action taken. This may include probation, suspension, or dismissal....

Companies have varying views and practices for handling multiple offenses. The type of drug abuse is pertinent to their evaluations

and actions....Data are lacking concerning the most effective treatment modality, but several weeks of intensive treatment for a significant drug problem may provide the best chance for recovery. In selected cases, intensive nonresidential treatment may be effective.

In addition to the Employee Assistance Program, drug awareness and education programs should be offered to employees and members of their families.

Legal and Security Concerns Consensus Statement

3. What can be done if an employee or prospective employee tests positive for drug abuse?

If a prospective employee receives test results indicating the use of illicit drugs, an employer may deny employment to that individual on that basis. However, that employer is encouraged to aid the prospective employee in entering a drug treatment program, if appropriate, and to reconsider him or her for employment if such a program is successfully completed or if subsequent tests demonstrate that the employee is no longer engaged in drug abuse.

If a current employee receives test results indicating drug abuse, action taken regarding that person's employment should depend on the nature of the employee's work. Although it is appropriate and legally defensible to suspend or terminate immediately any employee who has responsibilities directly affecting the safety or security of the public or other employees, employers should consider providing an opportunity for that employee, and other employees who test positive for drug abuse, to enter a drug treatment program and to be eligible for reinstatement in an appropriate position upon successful completion of that program. It may also be appropriate in certain situations of casual or infrequent abuse to allow an employee to demonstrate by one or more future negative tests that the drug abuse has been stopped. An

employer is justified in terminating the employment of any employee whose test yields results indicating drug abuse after appropriate opportunities for treatment or cessation of such abuse have been provided.

6. Legal requirements aside, what are the ethical obligations of an employer to employees who test positive for drug abuse?

The primary emphasis of workplace testing programs to screen employees for drug abuse should be rehabilitative rather than punitive for employees who receive positive test results. To the extent that it is consistent with the safe operation of his/her business and maintenance of public confidence in the product or service, the employer should provide an opportunity for employees either to enter a drug education and rehabilitation program and to be considered for reinstatement after successful completion of such a program or to demonstrate that the pattern of drug abuse has stopped. Eligibility for reinstatement should depend on the frequency and seriousness of an employee's involvement with drugs.

Human Relations Issues Consensus Statement

There is ample evidence available that drug abuse is a significant problem for the work setting and that any solution to the problem demands a multidimensional approach that includes identification, education, prevention, and treatment.

The goal of an employer's policy should be to maintain a work force free from impairment by drug effects detrimental to productivity, safety, and health, and at the same time to offer any employee who does not meet those conditions an opportunity, consistent with other employer policies, to be restored to an optimal level of performance.

Given what is known about the progressive nature of chemical dependency, employers are encouraged to include provisions for early identification which is desirable for optimal intervention. Specifically,

employers are encouraged to develop employee assistance plans (EAPs) to reach drug-abusing employees....

Source: National Institute on Drug Abuse. *Interdisciplinary Approaches to the Problem of Drug Abuse in the Workplace*. DHHS Publication No. (ADM) 87-1477. Washington, D.C.: U.S. Govt. Print. Off., 1987.

NOTES

¹ The range of estimates of the excess of benefits over costs is the result of the extensive sensitivity analysis SEI conducted on the Georgia Power Company data.

² The average number of years of employment at Georgia Power was 15.4 years; that of the discharged workers was 7 years. SEI subtracted the two figures to get the 8.4 years estimate. This is an underestimate, however, for the same reason that life expectancy is higher for someone aged 60 than for a newborn. Given someone who has been employed for 7 years, that employee's career expectancy must exceed the average.

³ The best known research on the connection between employment and substance abuse is Brenner (1975), who found a positive association between national unemployment rates and cirrhosis of the liver mortality rates. Two studies on the impact of layoffs indicate that individuals who remained laid off 2 years after a plant closing showed an increase in alcohol abuse, as did individuals who experienced job loss in the aircraft industry in the Hartford, CT, area during the preceding 10-year period (Buss and Stevens 1983; Liem and Rayman 1982). Holmes and Rahe's (1967) Social Readjustment Rating Scale, an instrument developed to quantify stressful and other life events, ranks being "fired at work" eighth most stressful on a scale of 43 items, with a mean "life-change unit" value of 47 points on a scale of 100. While such data and information do not directly support a link between dismissal due to drug abuse and exacerbated drug abuse, it would seem likely that this result would obtain for at least some drug-abusing employees.

⁴ Sanctions can take the form of punishment for drug abuse or lack of reward for good performance.

⁵ Moral hazard exists when the presence of insurance affects the likelihood or the extent of the loss.

⁶ An externality refers to the situation in which the price of a good or service indicates incorrectly one's interdependence with others. Externalities can take the form of either a benefit or an annoyance. Obtaining drug abuse treatment may benefit not only the individual applicant/employee receiving the treatment, but also that applicant/employee's family, friends, employers, and others in the community (including future employers). The person obtaining the treatment is not paid for providing these benefits; such benefits are external to the price system and thus qualify as an externality. To present the individual with the socially correct incentives for seeking drug abuse treatment, it may be necessary to subsidize the activity--obtaining drug abuse treatment--that generates these external benefits.

⁷ Mark Schlesinger particularly provided insightful discussion of this issue.

Table 1. Benefits and costs per discharged worker of Georgia Power's drug testing program

BENEFITS (PRESENT DISCOUNTED VALUE)		<u>Social Benefit?</u>
Medical insurance claims	\$15,599	No
Compensated lost time	2,552	No
Workers' compensation claims	1,529	No
<hr/>		
<i>Total benefits per discharged worker</i>	<i>\$19,680</i>	
 COSTS		 <u>Social Cost?</u>
Turnover/training	\$ 5,643	Yes
Litigation	748	Yes
Administration of tests	204	Yes
<hr/>		
<i>Total costs per discharged worker</i>	<i>\$ 6,695</i>	
 Net private benefits	 \$12,985	

Source: SEI (1989).

TARGETING SPECIAL POPULATIONS WITH DRUG ABUSE PROBLEMS: PREGNANT WOMEN

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Dramatic increases in the number of women who use illicit drugs during pregnancy have been reported. Pregnant women who abuse or are addicted to drugs are at risk of experiencing health problems related to drug use, as well as of giving birth to infants who may themselves experience withdrawal and various other problems, such as low birth weight and neurobehavioral deficiencies. The infant is at risk not only from the biological vulnerability due to drug exposure, but also from the impaired ability of some drug-using mothers to provide adequate care (Weston et al. 1989). Drug use during pregnancy is often intertwined with other health-related and economic problems that may impair health and parenting ability.

In President George Bush's *National Drug Control Strategy* (White House 1989), pregnant women using drugs are identified as a top priority for State treatment plans. Under the Bush strategy, States will be encouraged to develop outreach, identification, and treatment efforts for pregnant women, and the Federal Government will support research and demonstration projects to design and evaluate effective methods for treating this special population.

The purpose of this paper is threefold: to describe what is known and not known about drug use by pregnant women, as well as what treatment options are available for them (first section); to discuss the relevant policy issues (second section); and to identify the research questions that must be answered to make informed policy decisions (third section).

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STATE OF KNOWLEDGE

This section describes the scope of the problem in terms of the number of affected pregnant women and infants, the availability of treatment for pregnant women, and the maternal and infant outcomes of drug use. The scope of the problem may be viewed from both the demand side and the supply side of the "market" for drug treatment services. On the demand side, we discuss what is known about the size of the population in need of treatment services, emphasizing the methodological limitations of the estimates to date. On the supply side, there are simply no estimates of the number of drug treatment slots for pregnant women; instead, we review the anecdotal evidence that suggests there is a substantial shortage of treatment options for this special population.

We then review the effects of drug use during pregnancy on both the pregnant woman and the infant, as well as the effects of maternal detoxification and treatment on the fetus. Next, we describe the impact of maternal drug abuse on the health and other service systems, such as foster care. Finally, we discuss the issues of access, cost, and quality in delivering specialized drug treatment services to pregnant women, and we describe typical components of these programs.

Scope of Problem

Size of Population.

Of the 60 million women in this country of childbearing age (between 15 and 44) it was estimated from the National Institute on Drug Abuse's (NIDA) 1988 National Household Survey that 9 percent had used illicit drugs in the past month. Two percent reported using cocaine as

their drug of choice, and 6 percent used marijuana (NIDA 1989). However, these figures probably underestimate drug use for two reasons: users who do not reside in a household are not represented in the survey, and use is self-reported, and some respondents may deny drug use.

The precise number of women who use drugs during pregnancy and the number of drug-exposed births are unknown; moreover, the few available estimates of the actual scope of the problem vary tremendously. However, the numbers of both have been reported to be increasing dramatically in recent years due to the growing use of "crack" cocaine. For example, a recent congressional survey of 18 urban and suburban hospitals found over 80 percent of these hospitals reporting three to four times as many drug-exposed births in 1989 as in 1985 (U.S. Congress 1989a).

Through extrapolation of 1988 data from a national survey of 36 hospitals by the National Association for Perinatal Addiction Research and Education (NAPARE), it was estimated that 375,000 infants a year would experience fetal drug exposure as a result of maternal drug use. The percentage of drug-exposed births in the sampled hospitals ranged from 0.4 percent to 27 percent and was correlated with the thoroughness of the drug-assessment process employed by each hospital. On average, hospitals reported that 11 percent of births showed evidence of exposure to at least one of the following drugs: marijuana, heroin, methadone, cocaine, amphetamines, and phencyclidine (PCP) (NAPARE 1988).

This estimate of 375,000 drug-exposed births has been criticized as being too large because hospitals in large cities were overrepresented, the 11 percent average was used for the extrapolation, and marijuana was included as one of the drugs. It is argued that a better picture of the problem is obtained from looking at the number of "crack babies" born, which was estimated to be 30,000 to 50,000 per year (Besharov 1989a). Preliminary estimates from the National Hospital Discharge Survey also indicate that the number of babies showing evidence of drug exposure is much

smaller than the 375,000 estimate; nevertheless, the trend between 1979 and 1987 has been one of increasing numbers, especially in the most recent time period (Dicker and Leighton, In Press)

A number of methodological issues complicate the estimates of drug use among pregnant women. These methodological considerations include sources of data and techniques used to determine drug use, and problems in defining use. Most of the estimates rely in some way on hospital reporting of births in which there is evidence of drug exposure or in which the mother reports using drugs. Thus, to the extent that drug-using pregnant women choose to have their babies outside a hospital setting, these births would not be reflected in the estimates. Also, estimates that rely on self-reporting of drug use by pregnant women probably reflect underestimates of actual usage when compared with chemical drug testing. For example, a recent study found that, among pregnant women who had a positive urine assay, 16 percent of the marijuana users and 24 percent of the cocaine users denied using these drugs (Zuckerman et al. 1989).

Problems in defining use are twofold. The first relates to problems of defining when conception occurred. Many women may cease drug use when a pregnancy is determined but may, in fact, have used drugs between conception and positive pregnancy determination. The second problem relates to a definition of what constitutes use.

Lifetime use, current use, use in past year, use in past month, use in last 48 hours, and use during pregnancy are all commonly used terms. Yet many of these measures are not always comparable.

Research to date has focused primarily on small samples of inner-city populations; such research tends to reinforce the stereotype of use among the poor and minority population. Increasing evidence suggests, however, that the problem of drug use by pregnant women cuts across socioeconomic lines. Many treatment specialists believe that much drug abuse among pregnant women goes

undetected and untreated because physicians rarely question private patients about drug use and are unskilled in detecting the signs of drug abuse both in the mother and the infant. A recent study in Pinellas County, FL, found no significant difference in the frequency of drug use, as determined by urine samples, between women receiving prenatal care in public health clinics and those receiving care in private obstetric practices. There was a difference, however, in the type of drug used. Substances tested in the study included alcohol and marijuana, as well as other illicit drugs, and public clinics accounted for a higher proportion of cocaine use (Chasnoff et al. 1990). One limitation of this study is that many drug-using pregnant women do not seek prenatal care; thus sampling prenatal care settings represents an underestimate of drug use during pregnancy (U.S. Department of Health and Human Services (USDHHS) 1989).

Treatment Availability.

The number of drug treatment slots for pregnant women is unknown but is described anecdotally as extremely sparse. Treatment facilities have historically been oriented toward male addicts because illicit drug use, particularly that of heroin, was higher among men. Thus, treatment slots for women were few, and special slots for pregnant women were even fewer. In 1989, it was estimated that about one-third of clients in drug treatment facilities were female (NIDA and National Institute on Alcohol Abuse and Alcoholism 1990). However, the drug-using population is changing with respect to gender. Among young adults, women use crack as readily as men, and crack dependency is placing demands on the treatment system. But although the spread of crack in the late 1980s has increased the need for treatment slots for women, these slots, and those for pregnant women in particular, remain limited (Diesenhouse 1990; Alters 1989). In the above mentioned congressional survey, 12 of the 18 hospitals reported that they have no place to refer pregnant women for drug treatment (U.S. Congress 1989a).

Many treatment centers refuse to treat pregnant women. For example, a survey of 78 drug treatment programs in New York City found that 54 percent categorically do not treat pregnant women, 67 percent do not treat pregnant women on Medicaid, and 87 percent do not treat pregnant women on Medicaid whose primary drug of use is crack (U.S. Congress, Chavkin testimony, 1989a). A class action suit has recently been brought against three hospitals and a drug treatment center in New York City for refusing to provide drug and alcohol treatment for pregnant women (NY Times 1989). The implications of excluding pregnant women from treatment are that more infants will be born with the effects of fetal drug exposure and that there will be higher rates of maternal morbidity and mortality (U.S. Congress 1989).

More widespread availability of drug treatment may increase access to prenatal care. In one study, women enrolled in a methadone maintenance program were more likely to receive adequate prenatal care than drug-using women not enrolled in a treatment program (75 percent versus 50 percent) (Edelin et al. 1988). Thus, drug treatment can be viewed as an opportunity to engage women in prenatal care, just as prenatal care can be used to encourage drug treatment.

A shortage of treatment slots may have repercussions beyond the drug treatment system itself. Under Massachusetts law, drug abusing individuals who are a danger to themselves or to others may be required to obtain substance abuse treatment. However, the shortage of slots for women in Massachusetts is so acute that in 1989 more than 100 women who had not been charged with a crime spent time in prison because treatment placement was unavailable. A class action suit to stop this practice has been filed (Diesenhouse 1990).

There is an increasing number of programs specifically designed for pregnant women. Recent initiatives by NIDA to establish demonstration programs and by some States to give priority to pregnant women should expand treatment availability.

Effects of Maternal Drug Use

Drug use during and after a woman's pregnancy can seriously affect her health and that of her infant. The infant exposed to drugs may have serious health problems and long-term developmental and physical disabilities. Many studies have examined both the maternal and infant outcomes of drug use during pregnancy. Extensive reviews of this literature are available elsewhere, hence, only a brief overview of the findings will be presented here (see Jones and Lopez 1990).

Three methodological issues are apparent in assessing the effects of maternal drug use. First, it is difficult to control for confounding factors that may explain negative birth outcomes. Only a few studies have attempted to determine the societal and demographic factors that correlate with drug use during pregnancy. In addition to these factors, maternal health behaviors such as prior obstetric history (including risk factors such as histories of sexually transmitted diseases), nutritional status, and concomitant use of cigarettes and alcohol are important to the birth outcome and need to be studied more closely (Frank et al. 1988).

Second, most studies of women who use drugs during pregnancy classify users according to the use of a single drug. However, most drug-using pregnant women use several drugs, not just one (Wachsman et al. 1989; Zuckerman et al. 1989; Kariniemi and Rosti 1988). Polydrug use may occur for several reasons: to enhance the effect of one drug with another, to counteract the effects of one drug with another, or to substitute for the preferred drug (Bailey 1989). Polydrug prevention and treatment efforts need to account for the fact that reasons for polydrug use vary. The impact of varying drug combinations on mother and fetus also needs further attention.

Third, the amount and timing of exposure to drugs during the course of pregnancy has an impact on outcome, but the precise nature of the relationship requires further study.

Maternal Effects.

Studies of the maternal effects of drug use by pregnant women have been conducted on the various classes of illicit drugs. Many drugs have similar effects even though the drugs themselves are quite different. Some of the effects are described generically below. Special mention is made of crack cocaine because of the increased use of this drug by pregnant women and the demands it is placing on the treatment system.

Drug use places the pregnant woman at high risk because of such complications as sudden onset of uterine contractions; preterm labor; premature separation of the placenta from the uterine wall before delivery, which may lead to fetal or maternal death; and stroke. Many drugs have an anorexic effect, and some are associated with maternal hypertension (Jones and Lopez 1990).

Each of the classes of psychoactive drugs can cause organic mental disorder. Features of these disorders are psychological or behavioral changes, such as delusions and delirium related to drug-induced brain dysfunction. In addition to the direct effect on the mother, there may be indirect effects on the fetus as a result of what the mother does to herself (Jones and Lopez 1990).

Crack can produce dependency in a shorter period of time than other drugs and is frequently used in conjunction with other drugs to counter the depression that follows the crack high. Marijuana is used for this purpose, as is smoked heroin (Jones and Lopez 1990). Crack use is also frequently associated with increased sexual activity (Miller et al. 1989) and multiple sexual partners, and it is becoming a major source of human immunodeficiency virus (HIV) transmission (Jones and Lopez 1990). Increased sexual activity increases the probability of pregnancy and may account for the increased number of pregnant addicts.

Effects on the Infant.

Almost all drugs used by the pregnant woman cross the placenta. The effect of the drug varies by both the type of drug and the developmental stage of the fetus. Maternal drug use may have addictive attributes for the infant so that the infant must undergo withdrawal at birth. There may be teratogenic effects, which vary both with the time and dosage of exposure and with the organic systems that are under development at the time of exposure. There may also be toxic effects, which result in prematurity, intrauterine growth retardation, and low birth weight. Evidence of neurobehavioral deficiencies in the infant is common with many drugs.

One study, which compared three groups of pregnant women (cocaine users throughout pregnancy, cocaine users in the first trimester only, and non-drug users), found that women who cease cocaine use during the first trimester of pregnancy do *not* have an increased risk of giving birth to an infant who is premature and/or shows intrauterine growth retardation. However, the infant is still at risk for increased neurological deficits compared with infants whose mothers did not use drugs during pregnancy (Chasnoff et al. 1989). These findings point up the importance of a pregnant woman's getting into drug treatment as early in her pregnancy as possible. Successful treatment early in pregnancy makes a difference and is clearly preferable to late or no treatment; however, treatment prior to conception is still the better option.

No studies were found that examined the relationship between the level of drug consumption and birth outcome. In the above-mentioned Chasnoff et al. (1989) study, the women who ceased use in the first trimester were enrolled in a drug treatment program, indicating that their drug use was probably more than casual.

Longitudinal studies of drug-exposed infants are rare and are methodologically complicated to execute. Frequently, mothers and infants are lost to followup and/or the infant is separated from the

mother. It is difficult to control for the postnatal environment. Further, it is not known the extent to which an enriched postnatal environment may help to reverse some of the effects of drug exposure.

A group of toddlers who had experienced fetal drug exposure was compared with a group of toddlers who had been born prematurely but were not exposed to drugs in utero. They found that the drug-exposed group was less socially and emotionally developed, showed evidence of learning disabilities, and seemed unattached to the caregivers. Some of these differences were subtle and required assessment by experienced child development specialists (Rodning et al. 1989).

Detoxification and Treatment.

Detoxification and withdrawal during pregnancy are complicated because of the medical risks for the fetus. Cocaine withdrawal during pregnancy requires medical supervision and sometimes fetal monitoring because of possible fetal distress (Jones and Lopez 1990). The problem with methadone maintenance during pregnancy is that almost all of the infants experience severe withdrawal symptoms, sometimes more severe than those experienced by infants born to heroin addicts not on methadone maintenance (Edelin et al. 1988).

Treatment involving pharmacological interventions specific to each type of drug are not commonly used during pregnancy and lactation because of fetal risk. Instead treatment for pregnant women is typically limited to psychologically based interventions (Jones and Lopez 1990).

Impact on Health and Other Service Systems

Drug use by pregnant women has implications that extend far beyond the drug treatment and prenatal care systems. Major impacts are felt on other parts of the health system as well as on other systems, such as foster care and education. For

the most part, precise numbers are unavailable to document the scope of these effects.

Health System.

The negative birth outcomes of drug-exposed infants have been described above. Problems such as prematurity or withdrawal necessitate longer lengths of stay, frequently in the neonatal intensive care unit. Eight of the 18 hospitals in the previously mentioned congressional survey reported that cocaine-exposed babies stayed 1 to 13 days longer than infants who were not exposed to drugs (U.S. Congress 1989a). Thus, drug-exposed infants are costly to care for and are placing increasing demands on space in neonatal and pediatric units. Often, the mothers are uninsured and not eligible for Medicaid, which contributes to the problem of uncompensated hospital care.

Another impact of the drug-exposed infant on the medical system is the so-called boarder-baby situation. This situation arises when an infant who is medically ready for discharge remains in the hospital as a boarder for a variety of reasons, including lack of a foster care placement or delayed protective service evaluation. Eight of the 18 hospitals in the congressional survey reported that drug-exposed infants regularly remain in their hospitals as boarder babies (U.S. Congress 1989a).

Waiting lists for early intervention programs for infants and young children with special needs are becoming longer, and it is thought that the increased demand relates to infants with drug exposure problems. Many program directors claim that a larger number of infants have mothers who are substance abusers. The length of time an infant must wait is of special concern. Frequently, the first 3 months of life is the critical period for starting therapy, so waiting may result in a more severe handicap (Reid 1989).

Maternal and pediatric acquired immunodeficiency syndrome (AIDS) associated with maternal intravenous (IV) drug use have tremendous implications with respect to demands placed on the

health care and other service systems. Recent reports indicate that, of all HIV-infected children under age 13, 80 percent have parents with AIDS or AIDS-related complex. The most common route of maternal infection is through sharing contaminated IV drug equipment or through sexual contact with an infected IV drug user. Currently, 50 percent of all infants born to infected mothers are themselves infected with the HIV virus (Weston et al. 1989). As of July 1989, there were only slightly more than 1,600 cases of pediatric AIDS reported to the Centers for Disease Control, but experts expect that this population will grow dramatically over the next few years to as many as 10,000 to 20,000 cases (Pizzo 1989).

Foster Care System.

While many drug-using mothers can care adequately for their children, others are not able to do so. Estimates are unavailable on the extent of the problem. The child welfare system is increasingly involved in cases of abuse and neglect in which drug or alcohol abuse plays a role. Much of this increase occurred in the late 1980s and is generally thought to be related to the spread of crack. For example, in New York State the number of child neglect cases in which crack was involved was three times as great in 1988 as in 1986. In 1988, 80 percent of reported child abuse cases in Washington, D.C., involved substance abuse as compared with only 25 percent of such cases in 1985 (U.S. Congress 1989b).

Nationally, the number of children in foster care increased by 23 percent between 1985 and 1988, after it had decreased by 9 percent between 1980 and 1985. It is hypothesized that this increase also relates to the spread of crack (U.S. Congress 1989b). A more recent nationwide survey by the American Public Welfare Association estimated that in 1987 there were 280,000 children in foster care. Eighteen months later, there were 360,000 children in foster care--an increase of 29 percent. The pattern of increase varied across States, however; States with a less serious drug problem exhibited a flatter rate of increase. This provides

corroborating evidence that the recent increased demands on the foster care system may be related to the problems of drug abuse (Besharov 1989b).

Other Service Systems.

Many studies have attempted to document the impact of maternal drug exposure on infants. Far fewer studies have examined the longer term impact on school-age children. It is thought that the neurological damage caused by fetal drug exposure results in cognitive and emotional delays. Because the spread of crack is a relatively recent phenomenon, and most crack babies are currently younger than elementary school age, it would appear that the demands on the educational system for children with learning disabilities related to drug exposure will increase in future years.

There is evidence that psychoactive drug abuse can induce organic mental disorders, thus directly affecting maternal behavior. This finding has implications for the mental health system's involvement in providing pre- and postnatal preventive interventions to protect the mother and the infant. Also, the acute effects of many drugs mimic many mental disorders; thus the mental health system may become involved initially in the treatment of an individual who has a drug abuse problem and not a psychiatric condition (Jones and Lopez 1990).

Other systems are affected by maternal drug abuse as well. To the extent that pregnant women are prosecuted for exposing the fetus to drugs, the criminal justice system is involved. Although few cases have been prosecuted to date, there is a trend toward an increasing number. The welfare system is also affected, as drug-using women become pregnant and must rely on the system for support.

Service Delivery Issues

Access to Care.

Anecdotal evidence suggests that pregnant women are denied access to care because of a critical shortage of treatment slots. Even with sufficient capacity, however, various access barriers may prevent pregnant women from seeking drug treatment services. On the demand side, certain women may face sociodemographic barriers; these women include those who are of low income or low educational status, belong to a minority, have a language barrier, or are very young (especially under age 15). Previous studies of prenatal care patterns suggest that these groups are less likely to receive adequate prenatal care (Richmond and Filner 1979). Attitudinal barriers may also impede access--e.g., fear of being prosecuted and of losing custody of the child.

On the supply side, system-related barriers are more amenable to change by treatment providers (Brown 1989). Currently, most general treatment programs do not accept pregnant women into treatment, perhaps because of liability concerns or because they are not equipped to provide the specialized medical management that is required. Where specialized treatment services are available, access may be impeded if there is limited information on where to obtain services. In addition, waiting lists are especially problematic for this special population because of the narrow (less than 9 months) window of opportunity for prenatal care and drug treatment. Some treatment programs (including many of the more innovative ones) impose eligibility criteria that exclude certain subpopulations of pregnant women. Most of the programs serve women aged 18 and over, with few addressing the needs of pregnant addicted adolescents. In addition, some programs require that clients be drug free for a certain amount of time (ranging from 3 to 28 days) upon entry to the program. However, if access to detoxification services is also limited (in order for users to become drug free), pregnant women could be denied treatment during the early and critical stages of pregnancy. Finally, language

requirements (e.g., fluency in English) and a lack of child care might also restrict access for certain groups of women.

In designing programs to treat pregnant women who use drugs, both supply-side and demand-side access barriers must be addressed to engage and maintain pregnant women in the treatment system.

Cost of Care.

To our knowledge, no studies have been conducted on the cost of treatment for drug-impaired pregnant women and drug-exposed infants. What is the marginal cost of providing treatment to this special population? Two comparisons are of particular interest: prenatal care costs for drug-using versus non-drug-using women, and drug treatment costs for pregnant versus nonpregnant women.

In addition, no studies have been conducted comparing the cost of drug treatment with the benefits, such as a reduction in maternal mortality and morbidity and the improved medical, social, and educational status of infants. We would expect the "benefit-cost ratio" to reveal that the benefits outweigh the costs, but empirical research has not been conducted to confirm our intuition.

In a similar vein, cost-effectiveness studies that compare the outcomes of alternative service delivery models with the costs of providing those services have not been conducted. Not only are such studies nonexistent for pregnant women, but they are rare for the treatment population in general. However, the effectiveness of treatment for this special population needs to be considered differently from that for the general population, given that treatment must account for the impact of withdrawal and pharmacological intervention on both the woman and the fetus. Rapid withdrawal, for example, may produce fetal distress that is more harmful than passive dependence (Jones and Lopez 1990).

Research on the cost of treatment, including cost-benefit and cost-effectiveness studies, is critical to program planners. In the third section of this paper, we propose a research agenda that would address some of the unanswered questions related to the cost of treatment.

Quality of Care.

The quality of drug treatment services for pregnant women is another area in which little research has been conducted, yet this is an area that deserves considerable attention to develop model treatment programs. Studies of the quality of care may be intertwined with studies of its cost-effectiveness. According to Donabedian (1980), "the balance of health benefits and harm is the essential core of a definition of quality" (p. 27). However, a social definition of quality takes into account the finite resources. Donabedian concludes that, "given a specified quantity of resources devoted to medical care, the highest quality of care would be that which yields the highest net utility for the entire population" (Donabedian 1980, p. 28).

Thus, an assessment of the alternative service delivery models is needed, to determine which model(s) yields the best outcome for this special population.

POLICY ISSUES

The relationship between drug use during pregnancy and adverse maternal and infant outcomes is well established (USDHHS 1989). As a result, policymakers are faced with critical questions about the strategies to treat pregnant drug users. These policy questions may also be viewed as supply-side issues because they are amenable to intervention at the provider or treatment level. This section raises four policy issues that need to be considered:

- What is the appropriate allocation of resources to serve this special population

(e.g., Federal vs. State; public vs. private; criminal justice vs. prevention vs. treatment)?

- What constitutes a comprehensive treatment model?
- How can the identification of drug use during pregnancy be improved, and what are the implications for provider practice and training?
- What are the prevailing philosophical attitudes and how does each contribute to the improvement of pregnancy outcome? (Societal responses are reviewed, including criminal action against the mother, removal of the drug-exposed infant to child protective services, and treatment and care for substance-abusing pregnant women.)

Assessing the Allocation of Resources

The *National Drug Control Strategy* (White House 1989) cites pregnant women who use drugs as a population requiring special outreach and treatment services. Two main strategies are included in the national plan: (1) to sponsor Federal research programs that will design and evaluate models of outreach and treatment for pregnant drug-using women and their infants; and (2) to encourage States to consider outreach to and identification and treatment of this population a high priority. In developing a comprehensive strategy to address the growing concerns about drug use during pregnancy, policymakers need to consider the allocation of resources along several dimensions, including the role of Federal versus State agencies and of public versus private financing mechanisms, as well as the balancing of priorities for criminal justice activities, prevention, and treatment.

The Federal Government has recently increased the level of resources devoted to programs that treat pregnant women who use drugs. Both NIDA and the Office of Substance Abuse Prevention (OSAP)

have recently awarded multiyear grants to treatment programs for pregnant addicts. Additional slots will be provided for pregnant women and their children so that they will not be separated during treatment. Moreover, the NIDA program provides research demonstration grants explicitly to evaluate the effectiveness of alternative delivery models.

In addition to the NIDA and OSAP program grants, funds are provided to States via a block grant funding mechanism. The funding level for the alcohol, drug, and mental health block grant rose from \$487 million in fiscal year 1988 to \$806 million in fiscal year 1989 (Fogle 1989), of which about 32 percent was devoted to drug abuse treatment in FY 1989. These funds are provided to State agencies with minimal restrictions on how they may be spent. Although the *National Drug Control Strategy* encourages States to assign a high priority to outreach to and treatment of pregnant women who use drugs, it remains to be seen how many States will do so.

Additional sources of support for pregnant women who use drugs are Medicaid; the Supplemental Food Program for Women, Infants and Children (WIC); the Title V Maternal and Child Health Block Grant; and Aid to Families with Dependent Children (AFDC). Little is known, however, about the extent to which these sources are supporting this special population. Do pregnant drug users face barriers in obtaining Medicaid coverage or qualifying for AFDC? Similarly, how often does the WIC program cover this population? How many Title V programs offer services to pregnant drug users? Do all Title V programs accept pregnant drug users for prenatal care or do eligibility criteria exist?

While we know that private revenues constitute an increasingly large share of total drug treatment system funding, we do not know whether this same trend applies to funding for programs that treat pregnant addicts. One estimate suggests that private fee-for-service reimbursements account for 38.5 percent of total system funding (IOM 1990). It is likely that private third-party reimbursements

are not nearly as plentiful for this special population, but further analysis is required to determine whether this is the case.

Finally, policymakers need to consider the allocation of funds among the various aspects of the Federal antidrug strategy. A recent analysis of Federal antidrug outlays for fiscal year 1989 revealed that treatment is the least-supported leg, with \$3.6 billion devoted to criminal justice efforts compared with \$682 million for prevention and \$524 million for treatment (White House 1989).

Toward a Comprehensive Treatment Model

A profile of women who use drugs suggests that they have considerable medical and psychological problems, frequently including those related to physical, sexual, and emotional abuse both as children and as adults. They also tend to lack housing, food, job training, and education (U.S. Congress, Halfon testimony, 1989a). Thus, women who use drugs are at higher risk during pregnancy because of both medical and psychosocial conditions.

Pregnancy complications brought on by drugs can often be alleviated with proper care and treatment; however, most pregnant addicts neither use nor have access to prenatal care. The Expert Panel on the Content of Prenatal Care (USDHHS 1989) noted that use of some illicit drugs is associated with irregular or very late appearance for prenatal care. Recognizing that pregnant addicts are a hard-to-reach, hard-to-treat population is essential to developing a strategy to address their needs. According to Weston et al. (1989), "the challenge for the field is to design programs that can be preventive in focus and comprehensive in design, involving prenatal care, drug treatment, and infant-parent support" (p. 4).

Characteristics of Treatment Programs.

An unknown number of programs do provide specialized treatment services to pregnant women

who use drugs although no formal studies have been conducted to date that compare and contrast such programs. In the absence of published information, we spoke informally to representatives of 18 programs (located in nine States) that serve drug-impaired pregnant women.

Because of the multiplicity of problems faced by the pregnant addict, the programs tend to be multifaceted in their scope of services, providing not just medical care but social services, counseling, and educational services as well. In addition, the staff is usually multidisciplinary, using the combined efforts of physicians, nurses, social workers, counselors, and others to address the diverse needs of the target population.

Currently, most of the programs appear to perform relatively little outreach into the community. Most clients are referred through word of mouth, the court system, detoxification centers, and hospitals or clinics.

Some outpatient programs provide day care services, and some inpatient and residential services make provisions for both older children and babies to remain with the mother. However, this is still uncommon. Only slowly is it being realized that restricting women and their children from being together during treatment is actually deterring these women from receiving necessary care.

Comprehensive programs recognize the multidimensional nature of the medical services pregnant addicts require--not only drug treatment but also obstetrical care (including prenatal, labor, delivery, postpartum care) as well as overall medical attention. Because previous research has shown that pregnant addicts are less likely to receive prenatal care than other women (Miller 1989), it is important that prenatal services are closely linked to the drug treatment program; if not provided on site, these services are generally provided through an affiliation with a local hospital or clinic.

In addition to needing drug treatment and prenatal care, pregnant addicts often have other medical problems caused by violence, sexually transmitted diseases, and increased risk for HIV infection. In comprehensive programs, a staff physician or nurse practitioner is usually available to tend to these other medical needs.

Counseling and education is usually an integral component of most comprehensive treatment programs. Individual and family therapy are often provided to build the confidence of pregnant addicts and to help them learn to deal with and understand the effects of drug abuse. Drug and alcohol education and AIDS education may be provided in group or one-on-one sessions. Prenatal education, family planning, parenting, nutrition, and health classes instruct women on how to take care of themselves and their children.

Another goal of comprehensive treatment programs is to make the woman self-sufficient. A social worker or other counselor is usually assigned to work with each client to help her obtain such resources as welfare, WIC, Medicaid, food stamps, subsidized day care, and low-cost housing. Some programs also provide vocational counseling and job training, as well as educational programs to obtain literacy skills and high school equivalency certificates. For many programs, contact with the client does not cease once she graduates from the program. An aftercare component provides ongoing assistance to the woman and her children. Group meetings, where women share their experiences and concerns, may be held regularly, and family and individual therapy may also be available following discharge from the program. Stress management becomes important because the transition back into the community can be very difficult. And postpartum classes that focus on child-rearing techniques and on developmental status during the first 2 years of a baby's life can be extremely beneficial for women with little or no experience with children.

Finally, monitoring the growth and development of the children is an integral part of several programs. Recognizing the developmental delays

that are often associated with maternal drug use during pregnancy, a few programs (most notably the Pregnant Addict and Addicted Mothers program in New York) have established preschool programs with guided group play and individual instruction.

Reaching a Consensus.

Currently, there is no consensus on what constitutes a model program in terms of services provided, outcomes, and costs. Although most experts would agree that such programs should provide prenatal care, drug treatment, and psychosocial services, there is no agreement on how the services should be linked. At present, many programs refer women to hospital-based programs or private practice physicians for prenatal services. But what is the most effective means of providing prenatal care? Should treatment be in a residential or outpatient setting? Can outpatient programs adequately address the multifaceted psychosocial needs of pregnant addicts?

One way policymakers can have a large impact is in facilitating research studies that assess the objectives and cost-effectiveness of alternative programs models. (The following section of this paper identifies a series of research questions related to program design.) In addition, an expert panel consisting of program directors, physicians, nurses, social workers, and other treatment providers could be convened to evaluate the research results and develop a treatment model for pregnant women who use drugs.

Improving the Identification of Drug Use During Pregnancy

Estimates of the number of women who use drugs during pregnancy are wide ranging. However, it is unknown how many women use drugs during pregnancy without being diagnosed as drug users. Nine of the 18 hospitals participating in the above-mentioned recent congressional survey of

the prevalence and impact of drug addiction suggested that the number of drug-exposed infants and substance-abusing pregnant women was undercounted for three reasons: (1) denial of drug use by pregnant women; (2) lack of diagnosis by providers; and (3) limitations in the accuracy of drug-screening tests (U.S. Congress 1989a). Another study found that only 27 percent of women testing positive for drug use during labor and delivery had admitted using drugs (Miller 1989). And yet another study, conducted in Pinellas County, FL, revealed that there was no significant overall difference in drug use between white and black or rich and poor pregnant women; the most important distinction was that most of the black babies born to drug-using mothers were reported to the State (as required under a Florida law), but only a small percentage of white babies were reported (Chasnoff et al. 1990)

The Expert Panel on the Content of Prenatal Care (USDHHS 1989) recently provided guidelines for psychosocial risk assessment before conception and during pregnancy. The panel recommended that both the preconception visit and first pregnancy visit should include a history of illicit drug use. The panel also suggested that all women be offered (but not required to have) an illicit drug screen, along with a battery of other laboratory tests. According to the panel's summary report: "Many pregnant women who use illicit drugs during their pregnancy are not addicted and may not be aware of the substantial risk associated with infrequent use. They can be identified by history, and they may respond well to educational messages about risk" (USDHHS 1989, p. 83).

However, the panel recognized that, "in addition to primary prevention efforts, development of methods to improve the recognition of illicit drug use by health professionals" is necessary (USDHHS 1989, p. 84). This is especially important in light of frequent denials of drug use by pregnant women.

The Federal Government, through a variety of grants and contracts, has supported the development of educational resources for providers

in the area of substance abuse (Czechowicz, personal communication, 1989). Beginning in 1985, several of the medical societies, including the American College of Obstetricians and Gynecologists and the American Academy of Pediatrics, conducted a needs assessment and produced resource guides. More recently, a contract program was initiated to enhance curriculum and develop faculty in medical and nursing schools, and to integrate alcohol and drug abuse education across various hospital departments. Additional funds have been allotted by OSAP to expand the faculty development program to include social work. OSAP also intends to focus education initiatives on special topic areas such as perinatal addiction, and it plans to develop a computerized data base on substance abuse education and training resources. The Health Resources and Services Administration also has a substance abuse initiative to develop a curriculum for physicians on early recognition of substance abuse.

Policymakers should evaluate the level of resources currently committed to the education of providers, especially with regard to diagnosis and treatment of pregnant women who use drugs. Is the level of funding sufficient? Are funds being allocated efficiently and effectively?

Even with improved identification capabilities, policymakers should recognize that two other factors may prevent providers from offering treatment to pregnant women who use drugs. One is the concern about malpractice liability. Even a single exposure to cocaine in the first trimester of pregnancy may cause neurological damage; however, traces of cocaine might not be detectable at the time of delivery, potentially resulting in a finding of negligence against the physician. Also, maternal detoxification can subject the fetus to considerable risk; thus, fear of liability related to fetal problems is frequently offered as a reason that many providers refuse to treat pregnant women. Policymakers should consider the effect of malpractice concerns on access to care for this special population.

A second concern is the level of reimbursement for treatment. Medicaid generally provides a flat fee for prenatal care, labor, and delivery services. Because a pregnant woman who uses drugs is at higher risk and requires more intensive services, a provider may be reluctant to accept such cases. Policymakers should review the reimbursement policies under public programs to determine their impact on access to prenatal care.

Evaluating the Philosophical Approach

Although illicit drug use in the general population is an emotionally charged issue, the situation is even more complex in the case of a pregnant drug-addicted woman. Another issue arises--protecting the fetus from the adverse effects of drug addiction. Where treatment is concerned, whose welfare is being considered--the mother's or the fetus'?

Three schools of thought currently prevail on the best approach to dealing with drug use during pregnancy. One school maintains that treating the woman offers the best chance of improving both maternal and fetal outcomes. The second favors removing the child from the mother and treating only the child because the mother is essentially untreatable (Besharov 1989a). The third views the behavior of the woman as a criminal activity and turns to the criminal justice system rather than to the health care or social service systems.

There is a national trend toward expanding the scope of State and Federal intervention in a woman's pregnancy. More and more States are now considering the development of medical and legal regulations and statutes designed to control or limit a woman's behavior during pregnancy (McNulty 1987; U.S. Congress, Parness testimony, 1989a). The pregnant woman who uses drugs is especially at risk for these sanctions.

In many States, the drug-abusing mother faces the loss of custody of the newborn as a result of previous or continuing drug usage. Minnesota, California, North Dakota, and Washington all have

made injury to the unborn a criminal offense under tort law (U.S. Congress, Parness testimony, 1989a)

The Supreme Court ruled in two different cases (in 1925 and 1962) that addiction was an illness and did not constitute willful criminal behavior (U.S. Congress, Chavkin testimony, 1989a). Today the scenario is much different. With the increased use of "street drugs" and the increase in drug-related violence, policymakers are looking more and more toward criminalization of the drug addict.

Fetal rights and fetal well-being are also prominent issues of this era. Throughout most of history, the legal status of the fetus has been based on the "born alive" rule, which stated that "the fetus has to be born alive as a precondition to legal personhood" (McNulty 1987). Essentially, the mother and fetus were considered a single entity, and the welfare of the fetus was not considered separately from that of the mother. Today, fetal rights are increasingly being recognized and accepted. Legal precedents are being set in which the fetus has been acknowledged as a legal entity in circumstances that are not contingent upon subsequent live birth (McNulty 1987). Forced medical treatment to "protect the fetus" and child custody seizures of a fetus have resulted from tort findings related to prenatal abuse.

Recently a woman was tried before a grand jury for manslaughter in the death of her addicted newborn (Goodman 1989). Another woman was convicted of delivering drugs to the recipient in her womb, and in yet another case, a judge sent a pregnant woman to jail after a drug test revealed she was using cocaine (Goodman 1989). In California, an increasing number of infants are being taken away from their mothers at birth because of positive tests for drug abuse and perinatal addiction (McNulty 1987).

Policymakers need to consider whether criminalization serves the best interests of either the pregnant woman or the fetus. It is unlikely that a pregnant addict who fears imprisonment will enroll in a treatment program. Similarly, many

women fear their children will be taken away from them and so do not concede to treatment. Criminalization may also discriminate against poor minority women. Jessup and St. Clair (1989) suggest that the use of drugs by lower socioeconomic, nonwhite women is generally seen as a criminal activity while addiction in the white, middle-class population is viewed as a disease.

Even if policymakers were concerned only with protecting the fetus, imprisonment of a drug-addicted pregnant woman would not likely lead to an improved pregnancy outcome. It is unlikely that prisons provide an adequate level of prenatal care, nutrition, and social support. The implications of criminalization of drug use during pregnancy need to be considered further in terms of the impact on the mother, the child, and society at large.

RESEARCH QUESTIONS

Given the paucity of data on the scope of the problem, this section identifies a number of research questions that must be answered so that the demand for and supply of treatment within this special population can be better quantified. This section also discusses issues that need to be addressed when evaluating treatment programs.

Scope of Problem

To quantify the problem better, further conceptual work is needed in clarifying and delineating standard terminology and in establishing diagnostic criteria for drug abuse. Definitions of use and detection criteria need to be established. However, this is a generic issue in performing drug abuse services research, and it applies to all population groups, not just to pregnant women.

Characteristics of Pregnant Drug Users.

More detailed characteristics of pregnant women who use drugs need to be obtained. Basic sociodemographic information (such as age, educational status, and socioeconomic status) would be useful, as would be knowledge regarding a relationship with a male partner, use of prenatal care, history of abusing and being abused, other children, and housing and shelter arrangements.

This information would be useful in planning prevention efforts, outreach programs, and type of treatment. For example, a residential treatment program may be the preferred treatment program for a woman without a regular home. Child care is not necessary during pregnancy if there are no other children. The presence of a male partner who also uses drugs may make treatment more difficult and may require different intervention strategies. The type of intervention might be different for a young adolescent experiencing her first pregnancy than for an older mother who already has children.

Patterns of Drug Use in Pregnancy.

To develop better prevention efforts, it would be useful to gain an understanding of the etiology of initial drug use, presumably prior to pregnancy. Did drug use begin as a response to the social environment, stress, or psychopathology (Jones and Lopez 1990)? What was the progression in type of drug use?

There is also a lack of information on type of drugs used during pregnancy, extent of polydrug use, level of use, and pattern of use over time (e.g., episodic, daily). Whether patterns of use vary depending on the urban/suburban/rural location and geographic region is also unknown.

Such information would be useful for a variety of purposes--e.g., planning an educational campaign or deciding whether to implement a treatment program model that has been successful with a particular type of addict.

Service Delivery

Very little is known about the availability of treatment services for drug-impaired pregnant women, including addicts as well as occasional users. Moreover, little is known about the effectiveness of existing treatment models or which ones produce the best outcomes at the lowest cost? This discussion focuses on two research goals of critical importance: identifying the resources available to treat this special population, and assessing the need for and availability of treatment for pregnant addicts.

Inventories of Treatment Services.

Inventories of treatment programs, such as the National Drug Abuse Treatment Unit Survey funded by NIDA, do not currently gather information on the availability of treatment services for pregnant women who use drugs during pregnancy. Moreover, few States are aware of the programs that do provide such services, and their directories of treatment programs do not indicate whether pregnant women are served. An essential component of the research agenda, therefore, is to determine the availability of treatment services for this special population. Among the data elements that would be of interest are the following:

- Does the program treat pregnant women?
- Is prenatal care provided through the program (on site or off site), are pregnant women referred elsewhere for prenatal care, or must they obtain prenatal care on their own?
- Does the program serve men and women, or women only? Does the program serve women who are not pregnant?
- Are there any eligibility requirements for treatment: age, geographic location, drug-free status, language?
- Does the program maintain a waiting list? Are pregnant women given priority? How long is the waiting list for pregnant women?
- What types of outreach services and public education are performed? How are the clients referred to the program?
- Who operates the program (public, private)?
- Who funds the program? Do clients pay for any services out-of-pocket?
- How long has the program been operating?
- How many clients are served? How many are pregnant women?
- What type of treatment model is used: residential, outpatient, or inpatient?
- What medical, social, and educational services are provided--e.g., methadone maintenance/detoxification/rehabilitation; prenatal care; prenatal, drug, or vocational education; housing services; aftercare; parenting skills, etc.
- What is the average length of stay?
- Do women stay after giving birth? How long? Are there facilities for keeping their children with them?

As a first step, NIDA has initiated a large-scale survey of drug abuse treatment facilities to gather data on the availability of services for pregnant women who use drugs (among other topics). Known as the Drug Abuse Service Research Survey, this survey was fielded during late 1990, with results to become available in 1991. For programs that treat pregnant females, the survey will ask how many were treated during the previous 12 months, what services were provided, whether any pregnant females were referred to

another drug treatment program, and--of the total female client base--how many tested positive in pregnancy tests. This survey will fill an important gap in our knowledge of the scope and organization of the treatment system for drug-impaired pregnant women.

In addition to the national survey of treatment availability, individual State studies would also be useful. The *National Drug Control Strategy* (White House 1989, p. 44) encourages States to "make outreach efforts to and identification and treatment of expectant mothers who use drugs a top priority in their drug treatment plans." An inventory of drug treatment services for pregnant addicts would be a first step in addressing this mandate.

Assessment of Service Need Versus Supply.

Recent studies have suggested that there is a severe shortage of treatment slots for pregnant addicts. Anecdotal evidence from program directors indicates that there are significant waiting lists, even though pregnant women may receive priority. An important research question, therefore, is: What is the relationship between the need for and availability of treatment? To answer this question would require, in essence, a needs assessment of the population in need (as discussed above), together with an inventory of the available treatment resources (also discussed above). Such information should be disaggregated to the State level (at a minimum) to facilitate resource allocation and program planning.

Evaluation of Treatment Programs

Whether because of lack of funding, lack of time, or other reasons, no formal evaluations of treatment programs have been conducted to date. As a result, a number of important questions about program effectiveness remain unanswered. These questions become all the more salient as NIDA and OSAP have recently funded a series of demonstration projects for the treatment of

pregnant addicts. These initiatives present an ideal opportunity to establish a formal evaluation component involving multiple treatment sites to address the questions posed here.

Specification of Effectiveness Measures.

The first concern is how to measure the outcome or effectiveness of a treatment program for pregnant addicts. A thorough review and assessment of available measures is a prerequisite to implementing any evaluation protocol. Typical measures used to evaluate substance abuse programs include the abstinence and readmission rates after a specified period of time (e.g., 6 months, 1 year) following completion of the treatment program. Additional measures may be pertinent to a treatment population of pregnant addicts in light of their unique medical and social situations. For example, how often do they participate in aftercare following delivery? What is the rate of reduction in drug use during pregnancy? And for programs that use a methadone maintenance model during pregnancy, how often do clients engage in detoxification during the postpartum period?

In addition to drug treatment outcome measures, suitable measures of maternal and fetal outcomes are necessary. The literature contains numerous studies of fetal outcomes, but less attention has been paid to maternal complications and outcomes.

Assessment of Alternative Delivery Models.

The existing delivery system contains a myriad of programs with varying clinical settings, treatment protocols, and scope of services. Among the research questions that need to be addressed are the following:

- Can pregnant addicts be served effectively in a drug treatment program that serves men and women, women only, or pregnant women only? What are the costs

and outcomes of these treatment alternatives?

- What is the relative effectiveness of a residential versus an inpatient versus an outpatient treatment program? Does one type of setting address the pregnant addict's special service needs better than the others?
- What is the preferred method for providing prenatal care to this special population? Options include providing prenatal services within the drug treatment program, referring the client for prenatal services (with little coordination from the drug treatment program), or requiring the woman to find her own prenatal care (treating only the drug problem).
- Of the various drug treatment protocols (e.g., methadone maintenance versus detoxification programs), what are the variations in maternal *and* fetal outcomes? What are the advantages and disadvantages of alternative treatment protocols for this special population?
- What types of outreach efforts are most effective in bringing women into treatment, and what type of aftercare is required to support women after treatment?

Most of the recent studies have tended to focus on a single site, comparing the experimental group receiving treatment with a control group receiving no treatment. The next generation of research needs to move beyond the single site to include multiple treatment programs with alternative treatment approaches.

Assessment of Patient Outcomes.

Women who use drugs during pregnancy are not a homogeneous group. White, black, rich, poor, urban, rural--all segments of the nation's

population are touched by drug use during pregnancy. Research studies need to present disaggregated information by patient characteristics to assess whether some programs (or program components) are more effective than others for selected patient subpopulations. Of course, one limiting factor in some of the earlier studies, and especially in single-site studies, is the number of patients. Larger multisite studies would permit more disaggregated analysis of outcomes.

One recent finding by Amaro et al. (1989) that bears further exploration is that pregnant adolescents use drug treatment services more readily when such services are tied to prenatal care programs than when they are associated with drug treatment facilities. Is this a localized finding or is it generalizable to the adolescent population nationally? Are other patient characteristics (e.g., ethnicity, geographic location) also associated with service preferences that would lead to better outcomes?

CONCLUSION

Drug use during pregnancy requires intervention for the health of both the mother and the infant. There is an increasing demand for services by pregnant women, and treatment slots for this special population are in short supply. Because basic descriptive data on drug use patterns of pregnant women are lacking and because specific treatment strategies for pregnant users have not been studied, the questions regarding what type of treatment, for whom, when, and under what conditions are not fully answered. If expansion of the drug treatment system for pregnant women is to be done efficiently and if the impact on other service systems is to be mitigated, a major research effort is required to make informed decisions.

The negative maternal and infant outcomes of drug exposure are so well documented that, although precise estimates of demand and supply are lacking, expansion of treatment capacity is

critical. However, the expansion of treatment capacity must go hand in hand with a concerted research effort to assess the scope of the problem and to develop the most cost-effective treatment programs.

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