# Using State Information Systems
# for Drug Abuse Services Research

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*Political and social demands for effective and cost-effective treatments for drug and alcohol dependence challenge public policy makers and services researchers to assess provider performance, monitor client outcomes, and document effectiveness and cost-effectiveness of care. The information systems built and maintained by the public authorities that fund substance abuse treatment services are an underused source of information on provider performance, client characteristics, treatment completion, readmission rates, treatment outcomes, and costs of care. An overview of performance measurement and state substance abuse databases sets the context for the article. The authors' work with the Maine, Massachusetts, and Ohio substance abuse information systems demonstrates ways services researchers can investigate the organization, use, costs, and cost-effectiveness of publicly funded substance abuse treatment services. Finally, challenges of working with state databases—they are hard to access, must be handled carefully, can be difficult to interpret, and require collaboration with policy makers and treatment providers—are addressed.*

**Demands for evidence** of effectiveness shadow substance abuse treatment services. During the past decade, for example, purchasers and consumers have challenged publicly funded substance abuse treatment systems to document quality of care and demonstrate that services are appropriate, effective, and cost-effective. The Institute of Medicine (1990), however, found that state information systems for substance abuse treatment services were poorly maintained and underdeveloped. The report recommended investments in "data

acquisition systems" to manage, evaluate, and improve treatment services (Institute of Medicine, 1990).

State data systems evolved and matured following the Institute of Medicine (1990) critique. The data can contribute to analyses of the organization and delivery of substance abuse treatment services. Services researchers, however, must be sensitive to the limitations and idiosyncrasies in each state's database. This article reviews the development of performance measures, provides an overview of features of state data systems, and identifies caveats for researchers working with the data. Examples are drawn from our work with the states of Maine, Massachusetts, and Ohio. The data systems are reviewed and discussed to stimulate services research interest, to illustrate potential analyses, and to contribute to the policy discussion on the nature of information infrastructures for substance abuse treatment systems.

## DEVELOPMENT OF PERFORMANCE MEASURES

States are investing in the development of information systems to monitor the processes and outcomes associated with treatment for abuse and dependence on alcohol and other drugs. At least three factors contribute to the current impetus to build data systems: skepticism, managed care, and purchase of service reforms.

Persistent skepticism about the value of treatment for alcohol and drug dependence requires purchasers and providers to support data systems that record client attributes, track the use of services, and, increasingly, monitor outcomes to determine effectiveness. California, for example, documented reductions in alcohol and drug use, declines in criminal involvement, and improved employment and concluded that the treatment of substance abuse produced substantial savings to California taxpayers (Gerstein et al., 1994). Study results were used to combat beliefs that treatment is ineffective and to mobilize political support for increased state appropriations for substance abuse treatment and prevention services. Other states have used similar strategies to assert the general value of addiction treatment systems (e.g., Ohio, Oregon, Washington). Limitations in the design of these studies, however, leave some analysts unconvinced. Most of these studies are simple pre-post comparisons and fail to control for changes in behavior that may have occurred in the absence of formal treatment.

The introduction and expansion of managed care strategies for substance abuse and mental health services adds another dynamic to the demand for measures of effectiveness and the development of state information systems. Purchasers monitor measures of performance to assess access to care, track consumer satisfaction with care, and identify the most effective service providers. Commercial and public purchasers of health insurance, for example, collaborated with health plans and managed care organizations to develop the Health Plan Employer Data and Information Set (HEDIS) as a standardized set

of performance measures that can be used to assess and compare health plans (National Committee for Quality Assurance, 1996). Because HEDIS measures related to substance abuse services are limited, behavioral health plans have developed their own set of reporting standards—Performance Measures for Managed Behavioral Healthcare Programs (PERMS) (American Managed Behavioral Healthcare Association, 1995).

Changes in purchase of service contracts are a third factor accelerating the evolution of performance and outcome monitoring for substance abuse treatment. Increasingly, state and federal governments are implementing contracts that require demonstrations of specified levels of outcomes rather than just purchasing the delivery of services. The U.S. Department of Health and Human Services, for example, asked the National Academy of Sciences' National Research Council to assess the feasibility of linking performance expectations to federal funding for public health, mental health, and substance abuse services (National Research Council, 1997). The review found few currently collected measures that were directly applicable to assessments of state performance. Moreover, because of differences in data definitions and data collection procedures, as well as differences in the populations being served, it may be inappropriate to make comparisons across states. Despite these limitations, the review panel proposed measures to monitor health outcomes (e.g., alcohol- and drug-related death rates), processes (e.g., prevalence of screening pregnant women for alcohol and drug use), and capacity (e.g., percentage of at-risk populations using specialized services). Because outcomes are often difficult to assess, intermediate measures were suggested to monitor behavior risks (e.g., age of first use for alcohol, tobacco, and other drugs; percentage of adolescents disapproving of marijuana use). The Department of Health and Human Services appears to be ready to proceed with the implementation of procedures that require states to document results and meet performance expectations.

## OVERVIEW OF STATE DATA SYSTEMS

States vary substantially in the process of implementing information systems and requirements for outcome and performance measures. States are typically building on data collection infrastructures that recorded client characteristics and perhaps service use but did not include measures of change during treatment and follow-up assessments. These data systems are likely to draw increased attention from services researchers and contribute to analyses of the organization, delivery, and effects of publicly financed treatment services for alcohol and drug abuse and dependence. State data systems, however, are not easy to access, and an understanding of the idiosyncratic features of each system is essential for appropriate interpretation of data.

Most states and territories collaborate with the Substance Abuse and Mental Health Services Administration and participate in an administrative data system

that records admissions to publicly funded treatment programs for alcohol and drug abuse and dependence—the Treatment Episode Data Set (TEDS) (Substance Abuse and Mental Health Services Administration, 1995). Generally, substance abuse treatment services that receive any funding from state alcohol and drug abuse agencies (the state authority) are required to provide information on all admissions. The TEDS includes 19 required variables that states must collect and report and 15 optional data items that may be reported if collected. The data elements are outlined in Appendix A (required items) and Appendix B (optional items). TEDS represents the minimum data that states and treatment programs must collect.

A federal role in the collection and analysis of data from state substance abuse treatment systems was eliminated when federal funds for the treatment and prevention of alcohol and drug abuse were aggregated in 1980 into the Alcohol, Drug Abuse, and Mental Health Block Grant (Camp, Krakow, McCarty, & Argeriou, 1992; Institute of Medicine, 1990, 1997). During the decade with little federal role in the collection and use of client data, state data systems either evolved to meet changing needs or, in some states, were abandoned or neglected. States generally built on legacy data systems developed during the 1970s by the National Institute on Drug Abuse (the Client Oriented Data Acquisition Data Process [CODAP]) and the National Institute on Alcohol Abuse and Alcoholism (the National Alcoholism Program Information System [NAPIS]). The information systems reflect idiosyncratic developmental histories, variations in the resources committed to information systems, and the personalities and leadership in the state authority and provider organizations. Thus, when federal reporting requirements were reinstated, with the passage of the Comprehensive Alcohol Abuse, Drug Abuse and Mental Health Amendments of 1988 (P.L. 100-690) (Substance Abuse and Mental Health Services Administration, 1995), state information infrastructures varied substantially. The minimum client data set reflects compromises that addressed what was desirable, what was affordable, and what larger and smaller states were able to provide. Individual states may develop much more comprehensive admission, discharge, and billing systems. The inclusion of discharge data permits assessments of change from intake. Information on services delivered—either through a summary report or through accumulation of claims data—provides detail on the treatment process. Data from individual state databases, therefore, may be more detailed than found in the TEDS and permit relatively more complex analyses.

## THREE STATE DATA SYSTEMS

The Brandeis/Harvard Research Center on Managed Care and Drug Abuse Treatment is collaborating with the state substance abuse treatment and prevention authorities in Maine, Massachusetts, and Ohio to access and analyze admission, discharge, and service delivery information. Each state supports a

relatively well-developed data system that permits assessments of change in the reimbursement systems, alterations in populations served and services received, and variations in provider practice patterns.

## MAINE

Maine is primarily a rural state with population centers in Portland and Augusta. The state's population of about 1.2 million includes less than 1% persons of color. The state authority contracts directly with community-based providers to deliver treatment and prevention services. In fiscal year (FY) 1994, Maine's Office of Substance Abuse (OSA) contracted with 32 agencies for close to 100 different treatment programs. Nearly $6.8 million was allocated for treatment contracts. During FY 1994, 13,000 men (79%) and women (21%) were admitted to care. Less than 1% were persons of color. The mean age was 31.5 years, and 1 of 7 admissions (15%) reported an illicit drug as their preferred substance (85% listed alcohol as the preferred substance). Most admissions completed high school (68%), but more than half (52%) were unemployed. The median household income was less than $8,000. Two of 3 (68%) clients were involved with the criminal justice system. Discharge data suggest that between 80% (outpatient) and 90% (halfway houses) of the clients reported no alcohol or drug use in the 30 days prior to discharge.

In FY 1993, OSA altered the financing of alcohol and drug abuse treatment services. They began to monitor and report treatment provider performance and established specific standards for efficiency, effectiveness, and special populations. Efficiency standards monitor service use and require delivery of a minimum percentage of contracted services. Effectiveness standards reflect treatment outcomes and include self-report measures of drug use, employment and employability, criminal involvement, reduction in problems with family or employers, and referral in the continuum of care. Special population standards assess service delivery to target populations—women, adolescents, elderly, and poly-drug and intravenous drug users. The contract specifies a minimal standard for each indicator and requires that program performance remain at or above the minimal level on a specified number of indicators. In effect, OSA developed provider profiles that describe the use of financial resources, the amount of services delivered, and the outcomes of treatment. Commons, McGuire, and Riordan (1997) provide more detail on Maine's purchase of service reforms.

The Maine Addiction Treatment System (MATS) records admission and discharge data. At admission, a clinician records client descriptive information (e.g., demographics, alcohol and drug use, and measures of health and social functioning). When the client leaves a particular program (whether or not treatment is completed), a clinician again interviews the client. In addition to collecting current information on many of the admission variables, the clinician records the number and type of services the client received, expected payment sources, and referral information. If a client fails to complete treatment, the clinician completes the discharge form based on the last treatment contact with

the client as recorded in the clinical records. Termination status (no-show, arrest, death, etc.) appears on the discharge form. Information is collected for each treatment episode within an agency even if the client is referred from or to a program within the same agency. Service delivery information is available for each modality that a program offers and includes the number of units and unit cost. Each treatment episode notes the specific modality and agency. A client can be tracked throughout his or her treatment career.

Maine's data system has many strengths for research and program management purposes. The measures of outcome are comprehensive, and a substantial amount of information is available to adjust for the "case mix" of treated clients. The outcome measures appear to be sensitive enough to pick up the effect of the change in incentives introduced by performance contracting in 1993. Program effectiveness improved during a 4-year period—2 years before and 2 years after the introduction of performance contracting (Commons et al., 1997). Similarly, Lu and McGuire (1998) examined reduction in use and abstinence rates as outcomes and controlled for case mix. Instrumental variables techniques were employed to avoid the confounding of treatment length and intensity with unmeasured severity that bedevils effectiveness research with nonexperimental data. Approximately 10,000 outpatient episodes of care were studied, and clear evidence emerged for the effectiveness of treatment.

The Maine data, also, have important limitations that may be shared with data from other states. A major problem is that the data are reported by the clinician based on information reported by the client. The validity of the data is therefore open to question. Although some researchers have viewed self-report data favorably, and in practical terms, there is essentially no alternative; questions remain about whether the data are accurate or perhaps biased in some way. Clients, for example, may have an incentive to overstate the severity of their problem in an attempt to be admitted into treatment. Involuntary clients (referred by the legal system) may have the opposite incentive. Clinicians may also have incentives not to incur effort to report information accurately or to distort information. In a review of more than 1,000 episodes of outpatient treatment, we could find no confirmation in the clinical record of much of the information reported on the admission and discharge form. The presence of contradictory evidence in the record was uncommon, but it was common not to be able confirm information reported to the state.

Unavoidably, use of information to manage a system will introduce incentives to those reporting the information to report with a certain slant. We have attempted to investigate the distorting of information due to the introduction of performance contracting. Lu (1998) found that although measures of monitored performance (e.g., abstinence) improved following performance contracting, a measure of unmonitored performance (e.g., retreatment) did not suggest improvement. The analysis suggests a need for caution when interpreting measures reported by those who have something to gain by reporting favorable performance.

## MASSACHUSETTS

Massachusetts (population about 6 million) has a relatively large ethnically and racially diverse population (6% African American and 6% Hispanic; both concentrated in urban centers). Large cities are located in every area of the state, and there are few rural areas. The state authority's purchase of service budget of approximately $80 million is used to contract directly with community-based providers and supports nearly 300 contracts with about 150 different community-based organizations. During state FY 1994, more than 98,000 admissions were recorded to publicly funded services. The mean age was 33.5 years, 28% of the admissions were women, and the admissions included 16% African Americans and 11% Hispanics. In the year prior to admission, 62% reported using one or more illicit drugs, 82% used alcohol, and 26% reported using heroin in the year prior to admission. In addition, 41% of the FY 1994 admissions reported cocaine use during the year prior to admission. Although 53% of the admissions reported that they had no health insurance, some admissions indicated commercial health insurance or membership in HMOs (18%), and 1 in 4 admissions (25%) were Medicaid recipients.

The system began collecting data on admissions and discharges from publicly funded alcoholism treatment programs in February of 1983 (McCarty & Argeriou, 1983). A parallel system was implemented for drug abuse treatment services in July of 1985 (McCarty, 1985), and the two systems were modified and integrated during 1987. Significant revisions occurred during 1990 to comply with federal requirements for a national client data set (Camp et al., 1992). Camp et al. (1992) discussed the development and implementation of the 1990 version of the information system and provided detail on the variables and response categories. Since the 1990 modification, minor revisions have been made to facilitate client tracking and links with the commonwealth's Medicaid managed behavioral health care program. The Massachusetts client data set includes admission and discharge information from all clients entering publicly funded addiction treatment services and links billing data to the client record. One-page admission and discharge forms record client data, and claims data are linked to the client information. The system's goals are to improve system and program management, develop accurate descriptions of clients, and evaluate services and policies (McCarty & Argeriou, 1983). The data have been used to document readmission patterns to detoxification services (McCarty, Mulligan, & Argeriou, 1987), to evaluate time to readmission for homeless individuals treated in different settings (Argeriou, & McCarty, 1993), and to assess client trends and evaluate policy implementation and change (e.g., Camp et. al., 1992).

A major strength of the Massachusetts information system is that it is a claims-type database. Treatment programs invoice by admission for all units of service delivered during the prior reporting period (usually the past month). Fee-for-service contracts are awarded through a competitive-bidding process,

and unit rates for specified services are negotiated and standardized statewide. Claims are matched to admission records and paid if a valid admission form has been entered into the system. The Massachusetts information system, therefore, requires complete client data on the admission record before a claim can be paid, and it records paid units of service for each admission.

The discharge information enhances the value of the data but also has limitations. Variables completed at discharge include date of discharge, reason for discharge, referrals to additional services, services received during care, employment status at discharge, and achievement of clinical goals. Thus, client change during treatment can be assessed on some dimensions. Unfortunately, because discharge data are not required for payment, about 20% of the admissions do not have discharge information and are much higher for some treatment programs. Moreover, there appears to more variability in how programs define discharge variables. Variation in completion rates, for example, may reflect inconsistency in the definition of "completed treatment." Researchers, policy makers, and providers tend to have less confidence in analyses of discharge data.

Because a database has been in place since 1983, policy implementation can be assessed and monitored by looking at changes in patterns of care and in the populations served. McCarty, Caspi, Panas, Krakow, and Mulligan (1997) reviewed admissions to detoxification services and found substantial increases in access to care for women, African Americans, Hispanics, and injection drug users. Admissions of women increased from 12% during FY 1984 to 28% in FY 1997. Efforts to increase services for minority ethnic groups led to a doubling of admissions among African Americans (8% of admissions in 1984 versus 18% of admissions in 1997) and a six-fold increase among Hispanics (2% of admissions in 1984 versus 12% of admissions in 1997). Similarly, the spread of HIV infection among injection drug users led to policies that facilitated access to care (McCarty, LaPrade, & Botticelli, 1996) and resulted in dramatic increases—in FY 1988, 3,800 admissions reported injection drug use (12%); reported injection drug use increased to 13,000 admissions (29%) in FY 1997.

Currently, we are working the state substance abuse authority (the Massachusetts Department of Public Health, Bureau of Substance Abuse Services), the state association of treatment providers (Alcohol and Drug Abuse Association), and individual treatment programs to develop provider profiles for detoxification and outpatient services. The analyses suggest that differences among the treatment centers have more affect on variation in length of stay than differences among clients. Client characteristics and patterns of alcohol and drug use have much less influence on length of detoxification than the characteristics of the detoxification service—client-staffing ratios, funding levels, and use of medications. The analyses suggest that it may be feasible to develop a report for consumers that helps them select the most appropriate facility for their needs. This process has demonstrated the value of working closely with all groups of stakeholders to analyze and interpret data from the client information system.

**OHIO**

Ohio is a large state (10.8 million population) with substantial urban and rural areas. The Ohio Department of Alcohol and Drug Addiction Services (ODADAS) is the state alcoholism and drug abuse prevention and treatment authority. ODADAS works with county and regional planning boards to plan and fund more than 500 treatment services and 270 prevention programs. The total budget for state FY 1994 was $168 million, and of that, $121 million was distributed for treatment services. Publicly funded programs in Ohio reported more than 63,000 admissions to treatment during FY 1994. Ohio operates the public system through local (primarily single- or multicounty) boards. Each board has responsibility for managing allocated federal, state, and local funds.

All publicly funded alcohol and drug treatment services participate in Ohio's data acquisition system. The Alcohol and Drug Client Data Set (ADCDS) collects descriptive information about the client. Clinicians record client demographics, living arrangements, drug-use patterns, prior treatment, medical and criminal history, and source of referral and payment. Similar information is recorded when the client is discharged (case closure record), transferred to another modality of care (transfer record), or at the close of the state fiscal year (case summary records). Service amounts and types are recorded in the case closure and case summary records. The Uniform Financial Management System (UFMS) is used for budgeting and costing services. Directors of treatment programs complete worksheets that enumerate agency revenue, the volume of services, and the associated costs. Cost per unit of service is calculated and combined with the service volume information to determine the actual costs of care received. Descriptive estimates of publicly supported substance abuse treatment services were developed for the state and for selected substate areas to examine variation across the state in the allocation of resources.

First, nuances and patterns in the data were examined to identify potentially problematic information. Several data quality issues required analytical solutions to maintain data utility: failure to submit discharge data, duplicate records, record accuracy, and outliers on length of stay and service volume. One of four (25%) admission records could not be matched to case closure records, and information about length of stay and service use was not available. Presumably, missing case closure reports represent instances in which providers did not comply with data collection requirements or submitted case closure records that could not be matched to intake records. Missing case closure reports varied by admission modality. Long-term rehabilitation (35% missing case closure records) and ambulatory outpatient (26% missing) were more likely to be missing case closure records than shorter duration modalities such as freestanding (5% missing) and ambulatory detoxification (1% missing). The rate of missing case closure records also varied by provider and by the time of year in which the client was admitted.

Case summary reports provided a measure of service use for cases without case closure records. Duplicate admission and transfer records were identified

and eliminated (1.5% of admission records). Information contained on summary records that crossed fiscal years (7%) were summed across years and attached to the appropriate admission record. Finally, summary records with identical information found on the closure records (18% of summary records) were removed. Information from some of the closure and summary records was incomplete or inconsistent. One in five case closure records (22%) did not note any service for the treatment episode. Moreover, outlier cases were observed that reported illogical or atypical lengths of stay (e.g., detox episodes lasting 100 days or more). Similarly, calculation of length of stay was sometimes complicated with last date of service values that were inconsistent with other information. Limits on the maximum "plausible" length of stay were generated for each modality based on general clinical practices (i.e., reasonable lengths of stay for each modality) and through examination of statistical clustering around mean values. These outlier limits applied to 1% of cases with length-of-stay values.

County boards were compared on measures of use and costs. Estimates of the population below 100% of the federally defined poverty level were used to assess disparities in the use of public resources for indigent populations. Substantial differences were observed between metropolitan and rural boards. Differences are also apparent among individual boards within the RuralCare and MetroCare groupings. Table 1 and Table 2 summarize the analyses.

Statewide, about $53 per person in poverty was spent on publicly subsidized (in whole or part) substance abuse treatment in Ohio during FY 1994. In insurance terms, this is about $4.40 per member per month. In 10 major metropolitan boards/counties, spending was about $60 per person in poverty versus $31 per person in 13 nonmetro boards/counties (comprising 21 counties). Spending within the 10 metro boards ranged from $28 to $166 per person in poverty, whereas the range among the rural boards was from $12 to $84 per person in poverty. The variation among boards raises fundamental questions: whether this reflects differences in need for treatment across the areas, differences in meeting the need for care, or differences in how care is delivered.

Cost differences can also be analyzed in terms of differences in access to care and the costs of care. Spending per person in poverty was almost twice as high in metro as in rural boards, and access to care (measured by rate per 100,000 persons in poverty accessing care) was 20% higher for rural boards. Metro boards, on average, spent about $2,000 per person accessing care (admitted to treatment at least one time) compared to $850 in the selected rural boards. The higher costs in metro areas appear to be due to the use of more intensive and expensive modalities of care and to higher reimbursement rates per day enrolled in care. The duration of treatment enrollment was very similar in the metro and rural areas. Clients in the 10 metropolitan areas, however, were more likely to access hospital detoxification (3% vs. 0%) and residential services (36% vs. 10%). Within medium-intensity modalities, the metro boards paid $78 per day of enrollment versus $46 per day in the rural boards. Similarly, standard outpatient cost $8.65 per day enrolled (as opposed to per day a service was received) in the metro boards versus $4.40 in the rural boards. The cost

TABLE 1:    Access to Care and Estimated Expenditures for Metropolitan and Rural County
            Boards

| Type of Board | Access to Care[a] | | State Public Expenditures[a] |
| | Treated Individuals per 1,000 Residents | Treated Individuals per 1,000 Residents in Poverty | Expenditures per County Resident in Poverty ($) |
| --- | --- | --- | --- |
| MetroCare boards | 5.7 | 30.1 | 60 |
| RuralCare Boards | 6.0 | 36.1 | 31 |
| Other counties | 6.2 | 41.5 | 45 |
| State total | 5.9 | 34.0 | 53 |

a. Classified by client's county of residence.

difference per day enrolled in treatment is attributable to a combination of receipt of more hours/units of service while enrolled (about one third higher in urban boards) and to higher costs to deliver similar units of care.

Variations among boards reflect differences in local need for services, differences in local funding, and decisions on expenditure of funds. Estimates similar to these could be used to estimate rates for either insurance or managed care purposes should the state or a board elect to offer such contracts. Another critical limitation of the Ohio reimbursement system in use during state fiscal year 1994 with respect to being able to develop estimates of the cost of "insurance coverage" was the existence of reimbursement "caps" for each provider. Reimbursement of providers was nominally based on a fee-for-service basis; however, for each publicly supported provider there was effectively a cap on the total budget (and subcomponents by types of billable services) they could bill against during the year. This means that insurance and managed care entities would not know how much actual demand there was for substance abuse services over and beyond those actually delivered by publicly supported providers given their limited budgets. When service systems have demand in excess of funded capacity, patients may be queued. Thus, the number of patients served and the volume and value of services delivered may underestimate the actual demand for services. Changes in financing may alter the potential demand for services.

Note that in the development of the estimates, several major (and a number of minor) assumptions were made. First, we assumed that the public system is responsible for subsidizing care for the state's poverty population, and that other individuals pay for care through insurance or out-of-pocket. This group is estimated for Ohio (and the respective various boards of the state) using the population with household incomes at or below the poverty level. Second, treatment episodes in which the expected primary source of reimbursement was "public" or "self-pay" were assumed to be medically indigent individuals. National surveys have shown that client payments constitute a little more than 10% of treatment revenues. This discussion highlights how critical the data system will be to any steps to move toward contracting out components of public substance abuse treatment systems. Notably, it will be essential for a data system

TABLE 2: County Variations in Distribution of Services, Cost per Day of Care, and Mean Length of Stay

| | Distribution of Treatment Modalities[a] (%) | | | Cost per Day of Treatment[a] ($) | | | Mean Days in Treatment per Episode[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| Type of Board | Hospital Treatment (detox & rehab) | Other Treatment Modalities[b] | Standard Outpatient | Hospital Treatment (detox & rehab) | Other Treatment Modalities[b] | Standard Outpatient | Hospital Treatment (detox & rehab) | Other Treatment Modalities[b] | Standard Outpatient |
| MetroCare boards | 3 | 36 | 61 | 545 | 78 | 9 | 12 | 112 | 263 |
| RuralCare boards | 0 | 10 | 90 | N/A | 46 | 4 | N/A | 124 | 255 |
| Other counties | 1 | 10 | 89 | 401 | 60 | 5 | 15 | 167 | 304 |
| State total | 2 | 25 | 73 | 513 | 71 | 6 | 12 | 126 | 280 |

a. Comparison by county where treatment was received.
b. "Other" treatment modalities include residential and ambulatory detox, long- and short-term rehabilitation, and intensive outpatient.

1101

to have valid information about the insured or coverage status of clients, as well as the sources of payments for a given treatment episode.

Because the analyses are only a first step, the identification of differences among boards stimulates additional questions and speculation about the sources of the differences. Do discrepancies reflect different "needs" for services in the communities? Are some boards delivering higher quality services that are yielding better outcomes for clients and taxpayers? Are there real differences in the cost of delivering similar qualities of care in the various boards? Continued dialogue with state and county policy makers and with local treatment providers is required to address and resolve these questions.

## DISCUSSION

Our work with the Maine, Massachusetts, and Ohio substance abuse information systems demonstrates ways in which services researchers can investigate the organization, use, costs, and cost-effectiveness of publicly funded substance abuse treatment services. Assessments of provider and system performance, analyses of service use and trends, examinations of the costs and cost-effectiveness of care, and comparisons among individual treatment programs can contribute to the enhancement of system effectiveness and improvements in service quality. The data, however, are generally difficult to access, must be handled carefully, may be difficult to interpret, and require collaboration with policy makers and treatment providers.

State laws and regulations governing access to the data vary. Although selected localities may consider the data public information and release them to qualified investigators, states often classify the client variables and other information in the data file as medical records and protect the data from public release. Only summary reports are released as public information. It is critical, therefore, to develop strong collaborations with the policy makers who control data access and the treatment providers who participate in the data collection. Policy makers may be reluctant to work with independent investigators because analyses have political as well as scientific value. Ambiguities in the data often support multiple interpretations of results, and the leadership of major state agencies needs to have much confidence in the individuals authorized to analyze data. Collaborations with policy makers and providers require meaningful roles in the specification of the research questions, selection of the analyses, and interpretation of the results. Investigators who are reluctant to engage their partners in the analytic process may encounter limited access to the data.

Investigators must also protect the confidentiality of the data. The confidentiality standards applied to substance abuse treatment records are more stringent than those applied to most medical records. Because of the stigma attached to alcohol and drug dependence and to encourage treatment entry, the federal authorization to fund alcoholism and drug abuse treatment services required

federal regulations to protect the confidentiality of patient records—42 CFR Part 2 (Legal Action Center, 1991; Lopez, 1994). Qualified researchers may access patient records, without patient consent, if the research protocol protects the confidentiality of the data and does not permit redisclosure. Patients may not be identified directly or indirectly in research reports, and the information cannot be used to penalize or prosecute patients (Legal Action Center, 1991). These confidentiality standards are unique to the substance abuse field, and services researchers working in the field must be cognizant of and comply with the standards. As a general practice, researchers should remove patient-identifying information from the database before analysis begins.

The confidentiality standards also complicate efforts to track patients through the systems of care. Although readmission rates are often used as a measure of provider performance, assessments of readmission can be difficult. Because of the need to protect confidentiality, state data systems usually do not include patient name and address. Combinations of letters from patient names and dates of birth are used to construct patient identifiers that can be linked and tracked. The reality is that the resulting identifiers are not unique and that individuals using alcohol and drug abuse treatment services sometimes use a variety of names and nicknames. Thus, attempts to track readmissions must sort out false positives and false negatives. Researchers must be aware that tracking efforts may have less value than anticipated because of these limitations.

The complexity of the data systems offers another challenge to the use of state information systems. The data systems are complex, the treatment systems are complicated, and the intake and discharge interviews are often completed by disinterested and untrained individuals. A consequence is that even in the best of systems there are persistent inconsistencies in the ways in which interviews are completed, a spectrum of definitions for variables, and multiple sources of trivial and significant errors. Some variables may be of limited value because of variations in how the data values are defined. Researchers must appreciate the limits of the data and the subtleties of the data collection process. Conversations with policy makers and providers are essential to accurate interpretation of the data.

Finally, policy makers and providers have a proprietary interest in the data. They seek collaborations with investigators to learn more about the services they provide and the men and women they serve. It is essential to share results with both groups. Not only will investigators benefit from a more complete appreciation of the strengths and weaknesses of the analyses, but the treatment system benefits if the results can be used to improve and enhance system performance. Analyses of state databases offer substantial opportunity for the development of quality improvement processes (Fishbein & McCarty, 1997; Institute of Medicine, 1997). Providers can learn from services researchers, and the quality of care can be improved.

The discussion of limitations in the databases is not intended to discourage work with state data sets but to provide a realistic assessment of problems that

must be solved. Investigators should anticipate a significant investment of time and resources to draw value from the information systems. More systematic study of the databases from individual states will contribute to policy development, policy evaluation, and system improvements.

## APPENDIX A
### List of Required Data Elements for the Treatment Episode Data Set

Required data elements
    1. Provider identifier
    2. Client identifier
    3. Codependent/collateral status
    4. Transaction type
    5. Admission date
    6. Number of prior treatment admissions
    7. Source of referral
    8. Date of birth
    9. Gender
  10. Race
  11. Hispanic ethnicity
  12. Education (highest grade completed)
  13. Employment status
  14. Use of alcohol and other drugs
      Primary substance of abuse
      Secondary substance of abuse
      Tertiary substance of abuse
  15. Usual route of administration
      Primary substance of abuse
      Secondary substance of abuse
      Tertiary substance of abuse
  16. Frequency of use
      Primary substance of abuse
      Secondary substance of abuse
      Tertiary substance of abuse
  17. Age of first use
      Primary substance of abuse
      Secondary substance of abuse
      Tertiary substance of abuse
  18. Type of treatment service
  19. Anticipated use of methadone during treatment

## APPENDIX B
## List of Optional Data Elements for the Treatment Episode Data Set

Optional data elements
1. More specific codes for primary substances of abuse
2. More specific codes for secondary substances of abuse
3. More specific codes for tertiary substances of abuse
4. DSM III-R diagnosis
5. Presence of psychiatric problem
6. Pregnancy status
7. Veteran status
8. Current living arrangements
9. Primary source of income
10. Health insurance
11. Expected source of payment for treatment
12. Detailed categories for employment status
13. Detailed categories for criminal justice referrals
14. Marital status
15. Time waiting to enter treatment (days between first contact and first service)

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