

MEDICAID MANAGED CARE: EFFECTS ON THE PUBLIC SUBSTANCE ABUSE
TREATMENT SYSTEM IN MULTNOMAH COUNTY

By

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ABSTRACT

Managed care was developed to control the rising cost of health care. It was first introduced in the private sector but is becoming more common in the public sector. In the 1990s, growth in the costs of mental health and substance abuse services outpaced the rise in costs in most other areas of medicine. Because of this, managed care techniques have begun to be implemented in the behavioral health field as well. Most research on the effects of managed care on access, satisfaction, and quality of care have focused on physical health conditions and have looked at the private sector. It is likely that managed care may have different effects in the public sector and on mental health and substance abuse treatment.

In Oregon, concerns over the increasing portion of the public sector budget spent on health care prompted the introduction of managed care into the State's Medicaid program. A majority of Oregon's Medicaid recipients receive their health care services through fully capitated health plans (FCHPs). In exchange for a monthly fee for each enrollee, the FCHPs provide all covered health care services. Beginning in January of 1995, chemical dependency services were added to the Oregon Health Plan (OHP) on a fee-for-service basis. Thus, Medicaid clients began accessing substance abuse treatment through their health plans rather than approaching treatment agencies directly. Beginning in May of 1995, FCHPs were reimbursed for chemical dependency treatment through capitation payments rather than on a fee-for-service (FFS) basis. This research project compares process and outcome measures for drug and alcohol treatment clients in FFS versus

managed care.

Information on adults enrolled in publicly-funded drug and alcohol treatment programs in Multnomah County (Oregon) was extracted from a state-level database. Treatment agencies submit information on clients at admission and discharge from treatment. Cohort I (the FFS group) consists of all individuals beginning a substance abuse treatment episode between January 1, 1995 and April 30, 1995 and Cohort II (the managed care group) includes all individuals beginning substance abuse treatment between January 1, 1997 and April 30, 1997. Chi-square analyses were done on categorical measures and t-tests were done on continuous variables. Outcomes were adjusted for differences in baseline and demographic measures using stepwise logistic regression.

There were few differences in outcomes for the alcohol treatment sample. Individuals in managed care had higher 6-month treatment recidivism rates. In the drug treatment sample, there were several differences in process and outcome measures. Individuals in FFS received more intensive treatment, had much longer stays in treatment, and were more likely to reduce their drug use. In this study, individuals in managed care did not fare as well as those in the FFS payment arrangement. Managed care strategies which discourage the use of services may not be appropriate for substance abuse treatment since substance abusers already have a high resistance to entering and staying in treatment. Ultimately, untreated substance abuse may result in higher costs in other publicly-funded programs.

INTRODUCTION

Managed care developed in the United States as a result of the fragmented health care system and the continuous increases in cost. From the 1960s to the 1990s, health care costs rose more than twice as fast as costs in all other areas of the economy (Terris, 1998). Moreover, the growth in cost of mental health and substance abuse services has outpaced the rise in costs in most other areas of medicine (VanLeit, 1996; Grazier and Eselius, 1999). By the 1990s, states spent an average of 20% of their budgets on Medicaid programs (Stuart and Weinrich, 1998; Ridgely et al., 1999).

In the private sector, managed care has become the predominant delivery system for health care and it is becoming increasingly common in the public sector as well (Freund and Hurley, 1995). By 1997, 49 states were using some form of managed care in their Medicaid programs and nearly 50% of all Medicaid recipients were enrolled in managed care plans (Coughlin et al., 1999). Earlier managed care programs focused on physical health care but are now being developed for mental health and substance abuse services as well (Dangerfield and Betit, 1993).

Managed care is difficult to define since it covers a wide range of activities and settings. What the various arrangements have in common is that they attempt to influence the provision of health care services in a way that lowers costs while maintaining quality (Fairfield et al., 1997). Although there are endless variations, the most common types of managed care plans are health maintenance organizations (HMOs) and the preferred provider organization (PPO) (Fairfield et al., 1997).

HMOs are organized delivery systems that receive a fixed amount of money for each enrolled member in exchange for covering the member's health care needs. This financial risk may be assumed by the HMO or some risk may be shared with the health care providers. PPOs are organizations which establish a network of health care providers to serve an insured population on a reduced fee basis. Managed care organizations may use various utilization management techniques in order to control costs.

Some of the more common utilization management strategies include precertification (approval of services before they are delivered), concurrent review (ongoing review of care at regular intervals), and case management for high utilizers of health care services. Health care providers may also be expected to use clinical guidelines to determine a course of treatment, may have their practice patterns scrutinized to ensure their style is compatible with the goals of the managed care organization, or they may be offered monetary incentives for using less intensive or fewer treatment resources. Finally, the number and type of health care providers available and the benefit design offered to enrollees (i.e. exclusions, limitations, or co-payments), will influence treatment utilization (Mihalik and Scherer, 1998; Wells et al., 1995).

Incentives are also built into the managed care organization (MCO) through payment mechanisms. There is a payment arrangement between the payer and the MCO and also between the MCO and the health care provider. Contracts between the MCO and payer include full-risk capitation, partial-risk capitation, administrative services only, and administrative services with performance bonuses (Mihalik and Scherer, 1998). Capitation is an arrangement where the MCO agrees to provide health care services to a defined

population in exchange for receiving a prepaid amount for each enrollee. Full-risk contracts provide a strong incentive to control utilization since there is a potential for substantial profits or losses (Mihalik and Scherer, 1998). Partial-risk capitation involves staying within an established profit and loss margin. Above a certain percentage or amount, the payer retains the profits or suffers the losses. Under administrative service only contracts, the MCO continues to provide utilization management services but assumes no financial risk for enrollees. In the case of an administrative services only contract with a performance bonus, payers provide additional funds if specified performance goals are met.

Some of the most common payment arrangements between MCOs and health care providers include fee-for-service, capitation, case rates, and withholds (Mihalik and Scherer, 1998). Fee-for-service (FFS) contracts involve reimbursement for individual services at an established price. Providers may have an incentive to treat more patients and to provide more services since this will increase their revenue (Mihalik and Scherer, 1998). Capitation (fixed payment for providing services to a defined population) may be arranged between an MCO and an individual health care provider or group of providers. The incentives are comparable to capitation at the system level. Under case rate payment arrangements, health care providers agree to cover all necessary treatment for an established episode of illness and are paid according to a statistical model of average treatment expenses for specific diagnoses. This attempts to balance short term financial incentives with long term patient outcomes. In a withhold agreement, the MCO retains a percentage of payments until aggregate utilization measures are determined. Providers on

the panel who meet specified performance goals are more generously compensated, while those who do not receive a smaller proportion of the withheld funds. This type of arrangement may encourage under-treatment and does not take into account patient outcomes (Mihalik and Scherer, 1998).

Advocates of managed care claim that it offers many advantages over the traditional fee-for-service arrangement. First, it encourages cost-efficiency and early intervention (Hoge et al., 1994). It focuses responsibility on a single organization and increases coordination of care since one agency provides or purchases all services (Hoge et al., 1994; Gold, 1999). Finally, health care providers are often able to be more flexible in choosing what services to offer (Shore, 1996a). On the other hand, critics of managed care point out several disadvantages. Cost containment incentives may promote a focus on patient management rather than optimal outcomes, there may be less access to highly trained professionals or expensive services, and patients with relatively expensive diagnoses may be excluded from coverage (Cole et al., 1994).

Existing data on health care providers' responses to financial incentives is inconclusive (Miller and Sage, 1999). Clinical decision making is most likely to be influenced by the strength of the incentive and its linkage to individual patients (Goold, 1998). However, most clinicians are not very aware of their financial risks, except in broad, general terms (Grumbach et al., 1998). In addition, contracts with MCOs are becoming more complex and most health care providers have contracts with several health plans. Evidence suggests that health care providers develop a practice style that is compatible with the most dominant financial incentives rather than changing their practice style from one

patient to another (Hadley et al., 1999; Mitchell et al., 2000). For example, a study of primary care physicians in Washington state determined that compensation methods were not significantly related to cost or type of services provided. However, cost and utilization measures were shown to be related to patient and provider age, patient gender, and health plan benefit levels (Conrad et al., 1998). Physician financial incentives did not influence individual treatment decisions but did have an effect on overall productivity (Conrad et al., 1998). In the previously dominant fee-for-service compensation environment, there were incentives to provide more services. In this type of arrangement there is a risk that unnecessary services may be provided. In fact, there are instances where inappropriate surgical or radiologic services were provided to patients whose physicians had investments in these enterprises (Emanuel and Goldman, 1998).

Changes in payment levels for Medicaid and Medicare services also offer insight into the effect of financial incentives on health care providers. One study looked at the effect of an increase in Medicaid payments; the number of participating providers increased as well as the volume of services provided (Rice, 1997). On the other hand, a reduction in Medicare payments also resulted in an increased volume and intensity of services as well as a switch towards serving a greater number of patients with private health insurance (Rice, 1997).

In terms of satisfaction with their practices, health care providers who received strong or moderate incentives to reduce services were less satisfied than those who were encouraged to increase services or who did not receive any incentives (Hadley et al., 1999). In addition, providers were less satisfied if incentives were tied to productivity and

were more satisfied if incentives were tied to quality of care or patient satisfaction (Grumbach et al., 1998).

Managed care has generated considerable controversy, but there are few well designed studies in the research literature. This lack of information is largely due to the many difficulties of researching this topic. First, limited data is available due to the research being conducted in a proprietary, competitive environment (Wells et al., 1995). Most organizations are interested in receiving quick results while minimizing disruption in services. This results in reduced complexity of the studies, and often, the necessity to make design changes in the midst of a study. Second, maintaining confidentiality is of major concern to payers, insurers, and patients. This leaves little incentive to identify problems and a reluctance to allow access to certain data. Third, generalizability of the study results may be limited due to the diversity of managed care activities, the lack of standardized definitions of processes, and the continual changes in the managed care arena (Pincus et al., 1996). Finally, most research is focused on the overall impact of health care plans rather than on determining what individual elements are influencing specific outcomes (Pincus et al., 1996).

Despite these difficulties, there are several studies focusing on satisfaction and access to care for those enrolled in managed care plans. For privately insured individuals, the results have been mixed. A survey of employees by three large companies (N = 24,306 respondents) showed that overall satisfaction was greater for managed care enrollees while FFS enrollees were more satisfied with continuity and choice of provider (Hellinger, 1998). A random survey of 167,000 households with private insurance, showed that

HMO and indemnity (FFS) plan holders were equally satisfied with their plans but that indemnity enrollees rated access to medical services better than those in managed care plans (Hellinger, 1998). A follow-up study of the National Health Interview Survey showed slightly poorer access to care for HMO enrollees compared to those with indemnity coverage (Hellinger, 1998). Another study (which involved oversampling of individuals who were hospitalized, disabled, or in poor health) showed more problems with access and inadequate appointment times in managed care plans versus FFS plans (Hellinger, 1998). Additionally, a random survey of adults from three large cities showed that those with managed care plans were less satisfied than those in FFS plans. However, higher income individuals were more satisfied than lower income individuals regardless of the type of health plan (Hellinger, 1998). Finally, a study looking at disenrollment rates from managed behavioral health plans found that individuals with substance abuse problems and severe disorders were significantly more likely to disenroll than those with less severe problems (Gresenz and Sturm, 1999). Disenrollment rates were used as an indicator of dissatisfaction with the health plans.

For publicly-insured individuals, the results of access and satisfaction surveys have been more straightforward. However, the small number of these studies limits their generalizability. Medicaid enrollees in two studies reported more favorable results for managed care plans than for conventional (FFS) Medicaid programs (Sisk et al., 1996; Temkin-Greener and Winchell, 1991). Both surveys involved a random sampling of Medicaid enrollees before and after a switch from the FFS model to a prepaid system with the primary care provider acting as a gatekeeper to all medical services. One program

offered voluntary enrollment while the other was mandatory. There were no differences in the use of services between plan types, and managed care enrollees reported higher overall satisfaction and higher ratings of the quality of care.

For Medicare beneficiaries, the results were less favorable. In a 1990 survey of 12,800 randomly selected Medicare recipients, HMO enrollees were less satisfied with access, waiting times, and quality of care (Hellinger, 1998). Another survey of 12,000 Medicare recipients showed that HMO enrollees were slightly less satisfied, particularly those who were older or disabled (Hellinger, 1998). Finally, a randomly selected group of HMO enrollees was interviewed and compared to an earlier survey of FFS enrollees. Those in HMOs were three times as likely to report access problems (Hellinger, 1998).

Although satisfaction measures are important, they are probably not adequate for measuring quality. For instance, a statewide survey of insured individuals in California found a disparity between the percentage of consumers citing problems and those reporting dissatisfaction. Hospitalized or chronically ill individuals reported no difference in satisfaction levels compared to healthier individuals, but they were more likely to report problems that led to a worsening of their conditions (Enthoven and Singer, 1998). Well designed studies that focus on quality of care are even less numerous than those that focus on satisfaction.

Most outcome studies have focused on general medical conditions rather than on mental health or substance abuse disorders. The Medical Outcomes Study (MOS) is one widely cited study. Over two thousand patients from three large cities were followed for four years. Physical health outcomes (for those diagnosed with hypertension, type 2

diabetes, congestive heart failure, or recent myocardial infarction) did not differ for the average patient whether they were enrolled in a FFS or HMO system. However, low income individuals and those who were initially ill fared worse if they were enrolled in an HMO (Hellinger, 1998). Another study looked at survival rates (adjusted for severity) of non-Hispanic white women with breast cancer who were listed in the Orange County California Cancer Registry. Survival rates were highest at community and teaching hospitals and were lowest at HMO hospitals (Hellinger, 1998). Another study involved several annual telephone interviews of patients with rheumatoid arthritis. There were no differences found between HMO and FFS enrollees in the number of painful joints or in Health Assessment Questionnaire scores (Hellinger, 1998). Another survey of over 4,000 randomly selected Medicare beneficiaries who had joint pain did not show any difference in the likelihood of complete recovery based on type of health plan. However, those with continued joint pain during the previous year were significantly less likely to show improvement if they were enrolled in an HMO (Hellinger, 1998). Finally, another study of randomly selected Medicare recipients with colon cancer or strokes found no difference in complication or death rates between FFS and HMO enrollees (Hellinger, 1998).

A few studies have looked at outcomes for individuals with mental health disorders being treated in FFS and managed care systems. The previously described Medical Outcomes Study looked at patients being treated for depression. Those who were treated by psychiatrists fared worse in HMOs than in FFS plans (Wells and Sturm, 1995). Another major study, the Health Insurance Experiment (HIE), is the only published study where participants were randomly assigned to different types of health insurance plans.

Individuals in the prepaid health plan used more mental health services but their care was less intensive (they had fewer visits and were more likely to see a general practitioner rather than a specialist). No differences in outcome were found for the sample as a whole, but few individuals had severe or chronic mental illness (Mechanic et al., 1995).

However, the lowest income group who began the experiment with health problems fared worse in the HMO than in the indemnity plan (Hellinger, 1998). Another study in Monroe and Livingston counties (in upstate New York) looked at outcomes of seriously mentally ill individuals treated in the public sector before and after a switch from a FFS to a capitated health system. Costs were lower in the capitated system largely because of a decrease in hospitalizations and an increase in outpatient and case management services. Outcomes did not differ between the two groups (Reed et al., 1994). Finally, one study looked at a large private employer who switched from a FFS health insurance plan to managed care for employee behavioral health coverage. The managed care organization and the health care providers did not share any financial risk since the contract was for administrative services only and the providers were paid on a FFS basis. Costs were reduced while access was increased because services were less intensive and were of a shorter duration. However, no measures of quality were used (Goldman et al., 1998).

Even fewer studies have looked at managed care's effects on substance abuse treatment. An observational study examined changes in treatment style over time in a capitated managed care program in a midwestern city. There was a shift from extended hospital care to short-term detoxification without any increase in alternative forms of treatment (Mechanic et al., 1995). Another study compared managed care, private-pay,

and public-funded patients at a single treatment facility in Hawaii. No difference in two-year recidivism rates was found between the groups (Renz et al., 1995). Another study compared substance abuse treatment utilization claims for a single employer who switched from an HMO to a behavioral health carve-out plan for employee health coverage. Under the carve-out plan, cost and utilization decreased and outpatient and inpatient service use decreased. However, intermediate service utilization (residential, recovery homes, day treatment and intensive outpatient) increased under the carve-out plan (Stein et al., 1999). Another study compared health insurance plans at a single managed behavioral health organization (MBHO). The plans that put the MBHO at financial risk had similar patient access rates but costs that were 17% lower than plans which did not put the MBHO at financial risk (Sturm, 2000). Finally, Medicaid recipients in Philadelphia were followed before and after voluntary enrollment in HMOs was introduced. Drug and alcohol treatment clients served under the managed care arrangement received fewer services, had shorter treatment durations, and had more medical and family problems even though they were being served by the same outpatient programs (Larson et al., 1997).

In summary, managed care plans have been able to lower costs by providing less intensive services. However, results of satisfaction and outcome studies have been mixed. The most significant studies have focused on older HMO models and have shown large variations in outcomes between similar plans (Mechanic, 1998). Also, one flaw in previous literature reviews is the failure to control for differences in benefit levels. When only studies with similar benefit levels were compared, fee-for-service plans outperformed managed care plans on a variety of measures of quality of care (Sullivan, 1999). At this

stage in the research process, however, generalizability of the findings is limited. The largest area of concern appears to be the effects of managed care on certain subpopulations (lower income, the elderly, and the seriously or chronically ill).

In fact, many who receive publicly funded health care services are unemployed, disabled, or have serious or chronic illnesses (Shore, 1996b). In addition, the Medicaid population often requires a broad range of non-medical services due to difficulties with transportation, poor nutrition, inadequate social support, illiteracy, and other problems (Landon et al., 1998). Because of this, managed care may have different effects in the public sector than in the private sector.

Moreover, the public sector plays a dominant role in financing treatment for mental illness and substance abuse. Nearly two-thirds of all chemical dependency treatment is supported by the public sector, either through direct provision of services or by contracting with private treatment facilities (Mechanic et al., 1995; Mark et al., 2000). Historically, more limits have been placed on mental health coverage and fewer benefits have been provided compared to physical illnesses of the same scope and severity (Iglehart, 1996; Boyle and Callahan, 1995). This gap in needed services has resulted in a large reliance on the public sector even for those with private health insurance coverage (Grazier and Eselius, 1999; Shore, 1996b).

This research project is also important because substance abuse is a significant public health problem. Lifetime prevalence of alcohol use disorders in the United States has been estimated to range from 13.5% to 23.5% while current (6-month) prevalence ranges from 4.8% to 9.7% (Schorling and Buchsbaum, 1997). Lifetime prevalence of drug abuse and

dependence is estimated to range from 6.1% to 11.9% and current (6-month) prevalence ranges from 2% to 3.6% (Schorling and Buchsbaum, 1997). Drug and alcohol abuse have a profound effect on individuals, families, and society as a whole. Approximately 120,000 deaths a year in the U.S. are attributed to drug and alcohol use and economic costs total more than \$165 billion (Schorling and Buchsbaum, 1997). Drug use is also strongly associated with criminal involvement (Hiller et al., 1996). In fact, national estimates are that substance abuse is a contributing factor in the crimes of nearly 80% of all criminal offenders (News, Journal of Psychosocial Nursing, 1997). In Multnomah County (Oregon), a recent study estimated that nearly \$60 million of County spending was related to alcohol and drug abuse. The largest costs were borne by the criminal justice system, health services, and social service programs (Blackmer, 1993).

Fortunately, substance abuse treatment has been shown to reduce criminal behavior for an extended period after treatment completion and is actually less costly than incarceration (News, Psychiatric Services, 1998; Treatment Outcome Working Group, 1996). In Multnomah County (Oregon), a study showed a decline in arrests the year following participation in an assessment for substance abuse treatment (Barron and Finigan, 1999). Many other studies have also demonstrated that substance abuse treatment reduces health care costs, unemployment, welfare dependency, and homelessness (Amaro, 1999). A recent study in Oregon showed that, for every dollar taxpayers spent on addiction treatment, more than five dollars were saved on other programs (Office of Alcohol and Drug Abuse Programs, 1999). Despite the cost-effectiveness of providing drug and alcohol treatment, fewer than one in four individuals needing treatment will receive it.

This is due to a lack of funding, the individual's denial of the need for treatment, failure to identify the condition, or other system barriers (Larson et al., 1997).

Managed care may also have different effects on mental health services than on general medical care. There are some difficulties with mental health and substance abuse disorders that are not as common with general medical conditions. First, stigma and ignorance about mental illnesses often discourage individuals from seeking treatment, heighten concerns about confidentiality, dampen the ability of clients and families to advocate for needed services, and contribute to the lack of community support for mental health treatment (VanLeit, 1995; Dana et al., 1996). Additionally, there is little consensus regarding cost-effectiveness of differing approaches to treatment (Boyer, 1993; Iglehart, 1996). Because of this, there is much debate about how health plan benefits should be structured. Finally, many individuals with mental health and chemical dependency problems have chronic or recurring illnesses requiring ongoing support services in different treatment settings over time (Leshner, 1997; Mechanic et al., 1995).

BACKGROUND INFORMATION

By the late 1980s, Oregon was spending an increasing portion of the public sector budget on health care. In addition, 18% of the population was uninsured and costs of uncompensated care were being shifted onto private health care purchasers (Office for Oregon Health Plan Policy and Research, 1999; Gold, 1997). These concerns prompted the initiation of a series of health care reforms, referred to as the Oregon Health Plan

(OHP). A major component of the OHP was the expansion and reform of the state's Medicaid program. Coverage was extended to those with incomes up to 100% of the Federal Poverty Level, benefits were based on a prioritized list of paired medical conditions and treatments, and health care was provided through managed care plans. Detailed information on the development of the OHP can be found elsewhere (Pollack et al., 1994). A majority of Medicaid recipients (about 83%) receive their health care services through fully capitated health plans (FCHPs). In exchange for a monthly fee for each enrollee, the FCHPs provide all covered health care services (Office for Oregon Health Plan Policy and Research, 1999). Initially, coverage was only included for physical health services. Mental health and chemical dependency benefits were phased in over a period of several years (Pollack et al., 1994).

Oregon's Medicaid demonstration has resulted in expanded coverage to more individuals, has decreased the numbers of the uninsured, has reduced the use of hospital emergency rooms, and has reduced uncompensated care and subsequent cost-shifting (Leichter, 1999). It appears, however, that the OHP has resulted in only minimal cost savings in Oregon's Medicaid program (Jacobs et al., 1999). Surveys of OHP enrollees indicate equal or higher levels of satisfaction compared to the previous fee-for-service system (Office for Oregon Health Plan Policy and Research, 1999). What is less clear, however, is the effect the switch to managed care has had on the quality of health care services.

In January of 1995, chemical dependency services were added to the OHP on a fee-for-service basis. Thus, Medicaid clients began accessing substance abuse treatment through

their health plans rather than approaching treatment agencies directly. Beginning in May of 1995, FCHPs were reimbursed through capitation payments rather than a fee-for-service arrangement (Office of Medical Assistance Programs, 1997). Mandated benefits included outpatient treatment, detoxification, and methadone maintenance. FCHPs were also required to coordinate referral and follow-up of enrollees to residential treatment or supplementary services (i.e. mental health, employment, or legal services) (Office for Oregon Health Plan Policy and Research, 1999). Residential drug and alcohol treatment, and publicly-funded treatment for those ineligible for the OHP, is still provided through state and county programs. This staggered implementation of chemical dependency services into the OHP offers a unique opportunity to explore the effects of the introduction of managed care into the behavioral health field and into the public sector.

METHODS

Information on adults (age 18 and above) enrolled in publicly-funded drug and alcohol treatment programs in Multnomah County was extracted from a state-level database, the Client Process Monitoring System (CPMS). At admission and discharge, treatment agencies submit information on all clients receiving services. Employees from the State Mental Health and Developmental Disability Services Division enter the data into a mainframe computer. Two studies found a high degree of agreement (greater than 90%) between information in CPMS and information found in treatment agency databases (Windell, 1997; Blackmer, 1993). Although findings are mixed, previous research

indicates that substance abusers can reliably report information about past drug use, drug-related events, and demographic variables (Barron et al., 1999; Sobell et al., 1995).

Cohort I consists of all individuals with OHP coverage who began a substance abuse treatment episode between January 1, 1995 and April 30, 1995. This is the time period when health plans were reimbursed on a fee-for-service basis for covered chemical dependency treatment. Cohort II includes individuals with OHP coverage who began a treatment episode between January 1, 1997 and April 30, 1997. During this time period, health plans were required to provide substance abuse treatment as part of the mandated benefits package (in other words, there was no additional reimbursement beyond the monthly capitation payments).

After the initial sample was selected, detoxification or methadone maintenance episodes were excluded from the study due to the nature of the outcome measures. Finally, if an individual received more than one non-concurrent treatment episode during the four month period, only the first episode was included. The one exception to this is that residential or intensive residential treatment were included as primary treatments if outpatient treatment began first and residential or intensive residential treatment began within one month of starting outpatient treatment or within one week of completing outpatient treatment. This is to allow a reasonable amount of time to arrange for entry into treatment. For the most part, each treatment episode refers to one individual since few individuals received more than one type of treatment simultaneously (5% from cohort I and 3.7% from cohort II). The CPMS database has information on whether an individual was receiving drug treatment or alcohol treatment. When these groups were

compared, they differed on all but one of the baseline and demographic measures.

Because of this, separate analyses were carried out for each group. The sample size for alcohol treatment is $N = 828$ (cohort I = 379 and cohort II = 449). The sample size for drug treatment is $N = 1,118$ (cohort I = 452 and cohort II = 660).

Demographic variables and baseline measurements (at entry into treatment) as well as outcome measures following treatment were compared between cohort I and cohort II. Chi-square analyses were done on categorical measures and t-tests were done on continuous variables. Any differences in baseline or demographic measures between the groups were accounted for by doing a stepwise logistic regression analysis using all of the measures as independent variables.

Demographic and baseline measures include: gender, marital status, race/ethnicity, age, number of dependents (0-5 years old), number of dependents (6-17 years old), educational attainment, employment status, monthly income, number of substances currently used, current use of alcohol, current use of amphetamines, current use of cocaine, current use of marijuana/hashish, current use of opiates, and whether the individual was referred to treatment by a criminal justice agency. All of these variables were taken from the CPMS database.

Outcome measures taken from CPMS include: admission modality, treatment episode duration, reduction in drug use (during treatment), and treatment completion (defined as completing the prescribed treatment plan, completing at least two-thirds of treatment goals, and remaining abstinent for a minimum of 30 days prior to termination).

Process and Outcome measures that were created using information from CPMS

include: change in income, change in employment status, change in use of public assistance, change in homeless status, recidivism (defined as a return to treatment within six months of the start date of the initial treatment episode, since most recidivism occurs within three or four months of completing treatment; Thakur et al., 1998), early drop-out rate (defined as completing less than 30 days of treatment, since most attrition occurs within the first 30 days of entry into treatment; Carroll, 1997), percentage completing at least 90 days of treatment, and percentage completing at least 180 days of treatment.

One measure found in CPMS that was not used for this study is abstinence. The variable was defined as abstinence from primary substance of abuse at the end of treatment. The data was not reliable since even those who were still in treatment were included and some individuals who were listed as abstinent were also listed as not having reduced their drug use. The research literature indicates that abstinence is not a good indicator of treatment success due to the often chronic nature of substance abuse disorders (Treatment Outcome Working Group, 1996). Better outcome measures include those appropriate to chronic medical conditions, and should focus on broader social outcomes rather than just an individual's success or failure in treatment (Merrill, 1998). These principles were kept in mind in determining which outcome measures to use for this study. Additionally, variables were chosen to address some of the most common concerns about the effect managed care may have on the quality of substance abuse treatment.

RESULTS

For the alcohol treatment sample, there were few differences in demographics or in

baseline measures between the two groups (see Tables 1A and 1B). The average age of the managed care group was about two years older than those in the fee-for-service (FFS) group. Also, about twice as many individuals in managed care were currently using opiates. Finally, more individuals in the FFS group had been referred by a criminal justice agency. For outcome measures, the only statistically significant difference found in the alcohol treatment sample was for treatment recidivism (see Tables 2A and 2B). Those in FFS were less likely to return to treatment within six months of their primary treatment episodes. More individuals in managed care returned for the same type of treatment, and nearly four times as many as those in FFS returned for a more intensive treatment option (for example, if the primary treatment was outpatient and an individual returned for residential or intensive residential treatment). There was a non-statistically significant trend towards more individuals in managed care staying in treatment longer than 180 days ($p = 0.104$). There was also a non-statistically significant trend ($p = 0.064$) observed for change in employment status. Those in FFS were less likely to have a change in employment status while nearly twice as many individuals in managed care had a less stable employment situation after completing treatment. After adjusting for baseline differences, the difference in recidivism still remained statistically significant (see Table 5).

For the drug treatment sample, the groups had several differences in demographics and baseline measures (see Tables 3A and 3B). As found in the alcohol treatment sample, more individuals in managed care were currently using opiates and they were about two years older than individuals in the FFS group. In addition, individuals in managed care had more school-age children, higher incomes, and a more stable employment situation.

FFS individuals worked fewer hours or were more likely to be unemployed and not seeking work. There were more females in the FFS group and they used a greater number of drugs than those in managed care. The FFS group was more likely to use amphetamines and there was a trend ($p = 0.069$) towards greater use of marijuana.

There were also several differences found in the process and outcome measures for the drug treatment sample (see Tables 4A and 4B). For admission modality, the managed care group was more likely to receive outpatient treatment and the FFS group was more likely to receive residential treatment. The proportion of individuals receiving intensive residential treatment was six times higher in the FFS group. Also, more individuals in managed care dropped out of treatment early. The average duration of the treatment episode was much longer in the FFS group (84.1 days versus 61.7 days for those in managed care). Also, a larger proportion of individuals in the FFS group stayed in treatment at least 90 days (and at least 180 days). More individuals in the FFS group reduced their drug use during treatment and also had an increase in their income after completing treatment. Finally, there was a non-significant ($p = 0.079$) trend towards higher rates of treatment completion in the FFS group. After adjusting for baseline differences, the measures that remained statistically significant were reduction in drug use, treatment length exceeding 90 days, and treatment length exceeding 180 days (see Table 6). Admission modality could not be adequately adjusted using logistic regression since it was difficult to model as a dichotomous variable.

DISCUSSION

For the alcohol treatment sample, there were only a few differences in outcome measures between those in FFS and those in managed care plans. These differences tended to favor the FFS payment arrangement. Differences in recidivism rates could be an indicator of higher relapse rates in the managed care sample. On the other hand, it could be that those in managed care were more inclined to seek treatment after relapsing. This finding may also indicate the placement of individuals into inappropriate levels of treatment. Additionally, higher recidivism rates could point to a lower quality of care under the managed care system. Further research would be needed in order to explain these results. One possible problem with this variable is that those with shorter treatment lengths may have a greater chance of recidivism due to the longer post-treatment time interval during the 6-month period. That is not a concern in this case, however, since the average treatment lengths were not significantly different in the alcohol treatment sample.

The managed care group was somewhat older than the FFS group. Studies have consistently shown that time in treatment increases with age and that older individuals have lower rates of relapse following treatment (Greeley et al., 1999; Pickens and Fletcher, 1991). In Multnomah County, a study of the publicly-funded substance abuse treatment system also found that treatment completion rates increased with increasing age of the clients (Blackmer, 1993). The difference in age between the two groups in the current study would predict more favorable outcomes for the managed care group, however, the logistic regression model did not show age to be a confounder. The other

statistically significant difference found was that more individuals in the managed care group currently used opiates. Although this study did not include those receiving methadone maintenance, admission modalities were compared between the two time periods. Among OHP members, 25.7% of individuals in FFS and 18.8% in managed care received this service. It appears that a larger percentage of opiate users in managed care enrolled in outpatient or residential treatment rather than methadone maintenance. A recent study comparing methadone maintenance to detoxification and intensive outpatient treatment found that those receiving methadone maintenance stayed in treatment much longer and had lower rates of heroin use (Sees et al., 2000). Thus, opiate users in Multnomah County may be receiving less adequate treatment under managed care.

For the drug treatment sample, there were several differences found in outcome measures between FFS and managed care. These differences favored the FFS payment arrangement. The difference in admission modalities was expected since less intensive services are often favored in managed care settings. This may not be a concern since a review of randomized controlled studies found similar outcomes for clients in alcohol and drug treatment regardless of the treatment modality (Donovan et al., 1994; Gwydish et al., 1998). However, more intensive treatments may be needed for those with less social stability or more severe problems (Gwydish et al., 1998). In any case, the FCHPs are required to decide proper treatment placement level using criteria developed by the American Society of Addiction Medicine (ASAM). Factors that are taken into account include diagnosis, risk of withdrawal symptoms, need for medical care, stability of the home environment, extent of emotional or behavioral complications, motivation for

treatment, and the potential for relapse (Gondolf et al., 1996).

Individuals in managed care also received much shorter treatment episodes. This is a concern since treatment duration has been shown to effect post-treatment outcomes (drug use and criminal involvement) in three large-scale national studies of treatment effectiveness (Etheridge et al., 1999). The best outcomes were found for those completing at least 90 days of treatment while those completing more than 180 days showed even more improvement. In addition, increasing the frequency of therapy sessions did not make up for shorter stays in treatment (Etheridge et al., 1999). Another argument for longer treatment episodes is that relapse is most likely to occur within the first three to six months of abstinence (Meyer, 1996). Despite this, the majority of individuals who enter outpatient or residential treatment stay for less than three months (Hser et al., 1997). In the current study, only about a third of the individuals in the drug treatment sample stayed in treatment longer than three months. Also, only 17.0% in the FFS group and 8.6% in the managed care group stayed in treatment for more than six months.

Differences in demographics that may have influenced outcome measures in the drug treatment sample include gender, income, employment status, and number of drugs currently being used. Researchers have shown that women in substance abuse treatment have different characteristics and problems than men in treatment (Jessup, 1997). Despite these differences, outcome measures have not been shown to differ by gender (Alterman et al., 2000; Stein and Cyr, 1997). On the other hand, more stable employment and financial resources have been associated with lower rates of relapse following substance abuse treatment (Kearney, 1997). Also, individuals who use a larger number of drugs are more

likely to continue using drugs after treatment (Greeley et al., 1999). The logistic regression model showed that all of these demographic differences had an influence on outcome measures in this study (see Table 6).

There are several limitations to this research project. First, several potentially important variables were not included in the statewide database that was used for this study. No information was available on social support, psychological functioning, prior treatment episodes, or drug use histories (other than current use). Increased social support and better psychological functioning are associated with lower rates of relapse following substance abuse treatment (Kearney, 1997; Pickens and Fletcher, 1991). Frequency and duration of drug use also predict the likelihood of relapse (Greeley et al., 1999). In addition, a study of Washington's publicly-funded substance abuse treatment system found that individuals who had received prior treatment had higher treatment completion rates (Wickizer et al., 1994). Finally, a large-scale national study of treatment effectiveness showed that treatment appears to have a cumulative effect over time (Joe et al., 1999).

Second, CPMS does not have information on which health plan an individual was enrolled in when receiving substance abuse treatment. As a result, this study does not include information about how treatment providers were reimbursed for services. In fact, a study of access to substance abuse treatment in the Oregon health Plan found that the payment method to providers influenced the access rate to services (Deck et al., 2000). Another issue is the different organizational structures of the various health plans. For example, two of the major health plans (CareOregon and ODS) have benefitted from a

federal demonstration project (the Portland Target City Project) which enhanced coordination between agencies and improved outreach efforts to those who are in need of substance abuse treatment (Barron, 1998). These efforts may result in increased access to treatment (and supplementary services), better matching to appropriate treatment programs, and superior post-treatment outcomes for clients in the health plans who were involved in the demonstration project.

Third, there is no information available on organizational differences between treatment agencies, and different treatment providers were used for Cohort I and Cohort II (see Table 7). In addition, many individuals received treatment at programs which have not traditionally provided services to Medicaid clients since the health plans are only required to refer half of those seeking substance abuse treatment to established publicly-funded programs (Barron et al., 1999). A review of the research literature shows that there is large variability among publicly-funded treatment programs in terms of organization, services provided, and treatment efficacy (McLellan et al., 1993). Looking at randomized controlled studies of substance abuse treatment effectiveness, treatment retention rates varied from 11% to 93% (Miller, 1993). In Multnomah County, a study of the public treatment system found large differences in completion rates between agencies providing the same service, even after correcting for differences in client demographics and treatment length (Blackmer, 1993). Training or morale of staff members may also influence treatment outcomes. Research has shown that a therapist's personality, counseling style, and expectations have a large influence on clients' success (Miller, 1998). Finally, type and quantity of services provided can effect treatment outcomes. One study

of public treatment programs in Los Angeles showed that individuals who received more frequent therapy sessions had lower relapse rates after treatment (Fiorentine and Anglin, 1996). A large national study found that treatment agencies that provided more social and public health services had clients who were more committed to treatment (Broome et al., 1999). Not surprisingly, a study found that programs that provided more services in a specific area (i.e. family therapy or employment assistance) showed the best outcomes in that area (McLellan et al., 1993).

Another limitation of this study is that it looked at outcome measures at the completion of treatment and did not include a follow-up period. Due to the often episodic nature of substance abuse, it is difficult to determine whether abstinence or reduced drug use is attributable to receiving treatment. It may also be unclear if the individual has made lasting changes in attitude and behavior patterns. A researcher in the treatment effectiveness field has recommended collecting drug use information for a two year period preceding and following treatment (Moras, 1993).

CONCLUSION

Although further study is needed to draw a firm conclusion about the effects of managed care on Multnomah County's public substance abuse treatment system, preliminary results from this research project indicate that there may be cause for concern. In the alcohol treatment sample, individuals in managed care had higher recidivism rates than those in the FFS payment arrangement. For individuals in drug treatment, there were much shorter treatment episodes and less favorable outcomes for the managed care group.

Nationally, there has been a decrease in planned lengths of stay and in the number of services provided to individuals receiving substance abuse treatment (Etheridge et al., 1999). This has coincided with the introduction of managed care into the behavioral health field in the past decade.

As previously mentioned, untreated substance abuse will likely result in higher costs in other publicly-funded programs. Thus, managed care strategies which discourage use of services may not be appropriate for substance abuse treatment since substance abusers already have a high resistance to entering and staying in treatment (Hser et al., 1997). Moreover, public sector agencies may not be able to reduce costs as much as those in the private sector due to already tight budgets (Osher, 1998). Since Medicaid managed care is fairly new, there is little information available on its effects (Office for Oregon Health Plan Policy and Research, 1999).

Another concern about Medicaid managed care is that it can reduce access to care for those who are uninsured. A study of community health centers found that centers involved with managed care served a smaller proportion of uninsured patients compared to centers not involved with managed care (Shi et al., 2000). In addition, states with the highest percentage of Medicaid enrollees in managed care plans have the lowest access to care for low income uninsured individuals (Cunningham, 1999). This occurs because the traditional safety-net providers are forced to compete with private Medicaid managed care plans or to contract with the plans to provide services at low reimbursement rates. In Oregon, some safety-net providers have received payments as low as 25% of the level before the implementation of the OHP (Bodenheimer, 1997). Nationally, the number of

uninsured and underinsured individuals continues to grow (Kuttner, 1999). By 1998, 19.7% of adults and 15.6% of children did not have health insurance (Holahan and Kim, 2000).

Finally, an economist who studies health care reform pointed out that the rate of growth in health care costs in the United States has been steady for six decades, and short of global budgeting, this overall trend will continue (Glied, 1997). Efforts such as the introduction of managed care only slow the rate of growth for a few years since new technologies continue to be developed (Glied, 1997). In fact, this appears to be happening in Oregon. Health plans are complaining that capitation rates are not keeping up with the costs of new technology, especially newer prescription drugs. Because of this, many plans are discontinuing service to the Medicaid population (Rojas-Burke, 2000). Any effort at reform of the health care system (locally or nationally) must take into account the interplay between access, cost, and quality of care. Ideally, managed care in the public sector would best be used as a method for improving quality of care, especially in the area of substance abuse treatment.

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TABLE 1A.

Alcohol Treatment Sample
Cohort I and Cohort II Baseline Data: Percentage Distribution

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	379	449	
Gender:			
Male	238 (62.8%)	271 (60.4%)	0.472
Female	141 (37.2%)	178 (39.6%)	
Race/Ethnicity:			
White	286 (75.5%)	309 (68.8%)	0.240
Black	35 (9.2%)	58 (12.9%)	
Native American	44 (11.6%)	58 (12.9%)	
Asian	1 (0.3%)	3 (0.1%)	
Hispanic	13 (3.4%)	19 (4.2%)	
Other	0	2 (0.4%)	
Marital Status:			
Never married	159 (42.0%)	194 (43.2%)	0.499
Married	51 (13.5%)	49 (10.9%)	
Widowed	9 (2.4%)	8 (1.8%)	
Divorced	99 (26.1%)	118 (26.3%)	
Separated	30 (7.9%)	50 (11.1%)	
Living as married	31 (8.2%)	30 (6.7%)	
Employment Status:			
Full time	64 (16.9%)	75 (16.7%)	0.811
Part time	35 (9.2%)	38 (8.5%)	
Irregular	16 (4.2%)	26 (5.8%)	
Unemployed/seeking	101 (26.6%)	127 (28.3%)	
Unempl./not seeking	163 (43.0%)	183 (40.8%)	
Alcohol Use:			
No	0	0	N/A
Yes	379 (100%)	449 (100%)	

TABLE 1A.
continued

Alcohol Treatment Sample
Cohort I and Cohort II Baseline Data: Percentage Distribution

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	379	449	
Amphetamine Use:			
No	339 (89.4%)	396 (88.2%)	
Yes	40 (10.6%)	53 (11.8%)	0.570
Cocaine Use:			
No	312 (82.3%)	369 (82.2%)	
Yes	67 (17.7%)	80 (17.8%)	0.958
Marijuana Use:			
No	265 (69.9%)	327 (72.8%)	
Yes	114 (30.1%)	122 (27.2%)	0.356
Opiate Use:			
No	367 (96.8%)	419 (93.3%)	
Yes	12 (3.2%)	30 (6.7%)	0.022*
Crim. Justice Referral			
No	193 (50.9%)	281 (62.6%)	
Yes	186 (49.1%)	168 (37.4%)	0.001***

*p < 0.05; **p < 0.01; ***p < 0.001 by chi-square

TABLE 1B.

Alcohol Treatment Sample
Cohort I and Cohort II Baseline Data: Mean Scores

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	379	449	
Age, years	35.4	37.0	0.015*
Number of dependents (0-5 years old)	0.29	0.25	0.261
Number of dependents (6-17 years old)	0.40	0.39	0.884
Education, years	11.7	11.5	0.320
Monthly income, US\$	396.11	406.55	0.824
Number of drugs used	1.64	1.67	0.580

*p < 0.05; **p < 0.01; ***p < 0.001 by independent sample t-test

TABLE 2A.

Alcohol Treatment Sample
Cohort I and Cohort II Process and Outcome Data: Percentage Distribution

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	379	449	
Admission modality:			
Outpatient	349 (92.1%)	415 (92.4%)	
Residential	23 (6.1%)	30 (6.7%)	
Intensive residential	7 (1.8%)	4 (0.9%)	0.464
Reduction in drug use:			
Yes	169 (54.0%)	173 (50.6%)	
No	144 (46.0%)	169 (49.4%)	0.383
Treatment completion:			
Yes	123 (39.3%)	129 (37.7%)	
No	190 (60.7%)	213 (62.3%)	0.678
Income change:			
None	232 (74.1%)	266 (77.8%)	
Increased	61 (19.5%)	52 (15.2%)	
Decreased	20 (6.4%)	24 (7.0%)	0.346
Employment status change:			
None	226 (73.9%)	224 (68.5%)	
Improved	62 (20.3%)	67 (20.5%)	
Worsened	18 (5.9%)	36 (11.0%)	0.064
		Adjusted	0.520
On public assistance:			
Never	213 (68.1%)	227 (66.4%)	
No longer	14 (4.5%)	15 (4.4%)	
Began/continued	86 (27.5%)	100 (29.2%)	0.882
Homeless status:			
Never	282 (90.1%)	294 (86.0%)	
No longer	9 (2.9%)	11 (3.2%)	
Became/remained	22 (7.0%)	37 (10.8%)	0.225

TABLE 2A.
continued

Alcohol Treatment Sample
Cohort I and Cohort II Process and Outcome Data: Percentage Distribution

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	379	449	
Treatment recidivism:			
None	351 (92.6%)	385 (85.7%)	
Same treatment level	24 (6.3%)	45 (10.0%)	
Higher level	4 (1.1%)	19 (4.2%)	0.003**
			Adjusted 0.023*
Early drop-out:			
No	202 (64.5%)	232 (67.8%)	
Yes	111 (35.5%)	110 (32.2%)	0.372
In treatment 90 ⁺ days			
No	176 (56.2%)	201 (58.8%)	
Yes	137 (43.8%)	141 (41.2%)	0.511
In treatment 180 ⁺ days			
No	270 (86.3%)	279 (81.6%)	
Yes	43 (13.7%)	63 (18.4%)	0.104
			Adjusted 0.173

*p < 0.05; **p < 0.01; ***p < 0.001 by chi-square

TABLE 2B.

Alcohol Treatment Sample
Cohort I and Cohort II Process and Outcome Data: Mean Scores

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	379	449	
Treatment episode duration, days	90.6	90.9	0.962

*p < 0.05; **p < 0.01; ***p < 0.001 by independent sample t-test

TABLE 3A.

Drug Treatment Sample
Cohort I and Cohort II Baseline Data: Percentage Distribution

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	452	660	
Gender:			
Male	185 (40.9%)	329 (49.8%)	
Female	267 (59.1%)	331 (50.2%)	0.003**
Race/Ethnicity:			
White	308 (68.1%)	449 (68.0%)	
Black	95 (21.0%)	142 (21.5%)	
Native American	33 (7.3%)	42 (6.4%)	
Asian	4 (0.9%)	2 (0.3%)	
Hispanic	10 (2.2%)	18 (2.7%)	
Other	2 (0.4%)	7 (1.1%)	0.606
Marital Status:			
Never married	220 (48.7%)	314 (47.6%)	
Married	56 (12.4%)	70 (10.6%)	
Widowed	5 (1.1%)	4 (0.6%)	
Divorced	86 (19.0%)	152 (23.0%)	
Separated	52 (11.5%)	69 (10.5%)	
Living as married	33 (7.3%)	51 (7.7%)	0.550
Employment Status:			
Full time	29 (6.4%)	65 (9.8%)	
Part time	35 (7.7%)	50 (7.6%)	
Irregular	16 (3.5%)	19 (2.9%)	
Unemployed/seeking	112 (24.8%)	217 (32.9%)	
Unempl./not seeking	260 (57.5%)	309 (46.8%)	0.003**
Alcohol Use:			
No	200 (44.2%)	320 (48.5%)	
Yes	252 (55.8%)	340 (51.5%)	0.164

TABLE 3A.
continued

Drug Treatment Sample
Cohort I and Cohort II Baseline Data: Percentage Distribution

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	452	660	
Amphetamine Use:			
No	242 (53.5%)	413 (62.6%)	
Yes	210 (46.5%)	247 (37.4%)	0.003**
Cocaine Use:			
No	207 (45.8%)	316 (47.9%)	
Yes	245 (54.2%)	344 (52.1%)	0.494
Marijuana Use:			
No	239 (52.9%)	383 (58.0%)	
Yes	213 (47.1%)	277 (42.0%)	0.089
Opiate Use:			
No	352 (77.9%)	448 (67.9%)	
Yes	100 (22.1%)	212 (32.1%)	0.000***
Crim. Justice Referral			
No	310 (68.6%)	435 (65.9%)	
Yes	142 (31.4%)	225 (34.1%)	0.351

*p < 0.05; **p < 0.01; ***p < 0.001 by chi-square

TABLE 3B.

Drug Treatment Sample
Cohort I and Cohort II Baseline Data: Mean Scores

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	452	660	
Age, years	31.8	33.4	0.002**
Number of dependents (0-5 years old)	0.28	0.28	0.936
Number of dependents (6-17 years old)	0.23	0.33	0.023*
Education, years	11.3	11.4	0.252
Monthly income, US\$	226.86	297.01	0.004**
Number of drugs used	2.30	2.18	0.010**

*p < 0.05; **p < 0.01; ***p < 0.001 by independent sample t-test

TABLE 4A.

Drug Treatment Sample
Cohort I and Cohort II Process and Outcome Data: Percentage Distribution

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	452	660	
Admission modality:			
Outpatient	388 (85.8%)	604 (91.5%)	
Residential	40 (8.8%)	50 (7.6%)	
Intensive residential	24 (5.3%)	6 (0.9%)	0.000***
Reduction in drug use:			
Yes	211 (56.0%)	239 (44.9%)	
No	166 (44.0%)	293 (55.1%)	0.001***
			Adjusted 0.027*
Treatment completion:			
Yes	98 (26.0%)	112 (21.1%)	
No	279 (74.0%)	420 (78.9%)	0.082
			Adjusted 0.169
Income change:			
None	279 (74.0%)	426 (80.1%)	
Increased	72 (19.1%)	67 (12.6%)	
Decreased	26 (6.9%)	39 (7.3%)	0.027*
			Adjusted 0.073
Employment status change:			
None	277 (76.7%)	365 (73.0%)	
Improved	54 (15.0%)	86 (17.2%)	
Worsened	30 (8.3%)	49 (9.8%)	0.462
On public assistance:			
Never	250 (66.3%)	358 (67.3%)	
No longer	12 (3.2%)	16 (3.0%)	
Began/continued	115 (30.5%)	158 (29.7%)	0.951
Homeless status:			
Never	312 (82.8%)	436 (82.0%)	
No longer	28 (7.4%)	32 (6.0%)	
Became/remained	37 (9.8%)	64 (12.0%)	0.436

TABLE 4A.
continued

Drug Treatment Sample
Cohort I and Cohort II Process and Outcome Data: Percentage Distribution

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	452	660	
Treatment recidivism:			
None	373 (82.5%)	523 (79.2%)	
Same treatment level	55 (12.2%)	97 (14.7%)	
Higher level	24 (5.3%)	40 (6.1%)	0.391
Early drop-out:			
No	219 (58.1%)	272 (51.1%)	
Yes	158 (41.9%)	260 (48.9%)	0.038*
			Adjusted 0.135
In treatment 90 ⁺ days			
No	246 (65.3%)	396 (74.4%)	
Yes	131 (34.7%)	136 (25.6%)	0.003**
			Adjusted 0.007**
In treatment 180 ⁺ days			
No	313 (83.0%)	486 (91.4%)	
Yes	64 (17.0%)	46 (8.6%)	0.000***
			Adjusted 0.000***

*p < 0.05; **p < 0.01; ***p < 0.001 by chi-square

TABLE 4B.

Drug Treatment Sample
Cohort I and Cohort II Process and Outcome Data: Mean Scores

	Cohort I (fee-for-service)	Cohort II (managed care)	p-value
N	452	660	
Treatment episode duration, days	84.6	61.5	0.000***

*p < 0.05; **p < 0.01; ***p < 0.001 by independent sample t-test

TABLE 5.

Alcohol Treatment Sample
Multivariate Influences on Outcome Measures

Dependent Variable	Predictor Variables	Odds Ratio	p-value
Change in employment status (Improved vs. no change/worsened)	Male (vs. female)	1.71	0.000***
	Crim. Justice Referral (Yes vs. no)	1.59	0.000***
Treatment recidivism (Yes vs. no)	FFS (vs. managed care)	0.75	0.023*
	Male (vs. female)	0.78	0.047*
	Crim. Justice Referral (Yes vs. no)	0.54	0.000***
In treatment 180 ⁺ days (Yes vs. no)	Age (increasing)	1.03	0.025*

*p < 0.05; **p < 0.01; ***p < 0.001 by logistic regression

TABLE 6.

Drug Treatment Sample
Multivariate Influences on Outcome Measures

Dependent Variable	Predictor Variables	Odds Ratio	p-value
Reduction in drug use (Yes vs. no)	FFS (vs. managed care)	1.18	0.027*
	Crim. Justice Referral (Yes vs. no)	1.39	0.000***
	Amphetamine use (Yes vs. no)	1.47	0.046*
	Income (increasing)	1.00	0.022*
	Dependents, 6-17 years (increasing)	0.69	0.001***
	Education (increasing)	1.09	0.016*
Change in income (Increased vs. no change/decreased)	Male (vs. female)	0.77	0.017*
	Crim. Justice Referral (Yes vs. no)	1.68	0.000***
	Income (increasing)	0.99	0.000***
	Employment stability (increasing)	2.66	0.009**

TABLE 6.
continued

Drug Treatment Sample
Multivariate Influences on Outcome Measures

Dependent Variable	Predictor Variables	Odds Ratio	p-value
Treatment completion (Yes vs. no)	Male (vs. female)	0.79	0.012*
	Crim. Justice Referral (Yes vs. no)	1.32	0.003**
	Alcohol use (Yes vs. no)	1.99	0.020*
	Amphetamine use (Yes vs. no)	1.81	0.047*
	Cocaine use (Yes vs. no)	1.81	0.047*
	Marijuana use (Yes vs. no)	2.00	0.018*
	Dependents, 0-5 years (increasing)	0.73	0.050*
	Number of drugs used (increasing)	0.24	0.015*
Early drop-out (Yes vs. no)	Male (vs. female)	1.17	0.044*
	Crim. Justice Referral (Yes vs. no)	0.81	0.006**
	Opiate use (Yes vs. no)	1.49	0.035*

TABLE 6.
continued

Drug Treatment Sample
Multivariate Influences on Outcome Measures

Dependent Variable	Predictor Variables	Odds Ratio	p-value
In treatment 90 ⁺ days (Yes vs. no)	FFS (vs. managed care)	1.24	0.007**
	Male (vs. female)	0.75	0.001***
	Crim. Justice referral (Yes vs. no)	1.45	0.000***
	Education (increasing)	1.12	0.008**
In treatment 180 ⁺ days (Yes vs. no)	FFS (vs. managed care)	1.55	0.000***
	Male (vs. female)	0.77	0.031*
	Crim. Justice Referral (Yes vs. no)	1.34	0.012**
	Age (increasing)	1.04	0.028*
	Education (increasing)	1.16	0.009**

*p < 0.05; **p < 0.01; ***p < 0.001 by logistic regression

TABLE 7.

Alcohol and Drug Treatment Samples
Treatment Providers

N	Cohort I (fee-for-service)	Cohort II (managed care)
831	831	1109
Treatment Agency:		
Addiction Recovery Assoc.	22 (2.6%)	20 (1.8%)
Alder Associates	4 (0.5%)	1 (0.1%)
AT&TC (OHSU Behav. Health)	36 (4.3%)	70 (6.3%)
ASAP Treatment Services	96 (11.6%)	109 (9.8%)
Caremark Behav. Health	0	60 (5.4%)
CODA	69 (8.3%)	91 (8.2%)
DePaul Treatment Centers	83 (10.0%)	86 (7.8%)
Diversion Associates (Changepoint)	89 (10.7%)	74 (6.7%)
El Programa Hispano	0	1 (0.1%)
Harmony House	5 (0.6%)	6 (0.5%)
InAct	0	68 (6.1%)
Kaiser Permanente	0	34 (3.1%)
Native American Rehab. Assoc.	49 (5.9%)	89 (8.0%)
Network Behavioral Health	105 (12.6%)	119 (10.7%)
N.W. Treatment Services	40 (4.8%)	30 (2.7%)

TABLE 7.
continued

Alcohol and Drug Treatment Samples
Treatment Providers

N	Cohort I (fee-for-service)	Cohort II (managed care)
	831	1109
Treatment Agency:		
Pacific A&D Counseling	0	2 (0.2%)
Ptld. Addict. Acupuncture Center	99 (11.9%)	93 (8.4%)
Project for Community Recovery	19 (2.3%)	60 (5.4%)
Project Network (Legacy)	1 (0.1%)	5 (0.5%)
Providence	0	79 (7.1%)
Serenity Lane	0	5 (0.5%)
TASC	58 (7.0%)	0
Transition Projects, Inc.	56 (6.7%)	7 (0.6%)