Briefing Paper

Cost Savings in Medicaid Medical Expenses: An Outcome of Publicly Funded Chemical Dependency Treatment in Washington State

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Washington State Department of Social and Health Services
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Research and Data Analysis

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A Five Year Cost Savings Study of Indigent Persons Served by Washington State's Alcoholism and Drug Addiction Treatment and Support Act (ADATSA)

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Table of Contents

Overall Medicaid Medical Cost Savings Summary of Results

Background

This research involved a five year follow-up study of 557 clients receiving chemical dependency treatment under the Alcohol and Drug Addiction Treatment and Support Act (ADATSA). This legislation, passed in Washington State in 1987, created a program to treat adults addicted to alcohol or other drugs. To qualify, clients must be indigent, unemployable and incapacitated due to their addiction. A maximum of six months of treatment and financial support is provided in any two-year period. The immediate goal of the program is abstinence, while ancillary goals include improved personal coping skills, as well as vocational and social skills. Success in moving toward these goals is expected to result in improvements in reaching the long-term goal of self-sufficiency. The program is administered by Washington State's Division of Alcohol and Substance Abuse (DASA)

The typical ADATSA client is an unmarried, white male in his early thirties, often homeless, living alone or with non-relatives, and often involved with the law. One out of every three clients is female, one out of every three is an ethnic minority. The average client has had a 15 year history of substance abuse starting at age 16, with one or more prior treatment episodes. A significant number of clients have physical, mental, or emotional problems. Clients with such characteristics provide a formidable test of the effectiveness of treatment.

The Study

The key question in this research was whether receiving chemical dependency treatment under the ADATSA program resulted in reduced Medicaid expenses. To answer this question, we compared Medicaid medical costs of those who received chemical dependency treatment in 1989-90 (n=344) with a similar group who were eligible but did not receive treatment in the same time period (n=213). Data for this study came from two sources. Information on chemical dependency treatment and the background characteristics of clients came from DASA's Substance Abuse Management System (SAMS), which has since been succeeded by the Treatment and Assessment Report Generation Tool (TARGET). Data on Medicaid medical costs came from Washington State's Medicaid Management Information System (MMIS), which records and processes all Medicaid claims in the state. Common client identifiers allow us to match information from these two independent sources.

'Treated' clients are defined as those who received at least 30 days of chemical dependency treatment, either inpatient or outpatient, or who completed at least the primary phase of treatment. 'Untreated' clients are defined as those who did not receive any treatment or those who entered and dropped out in the first 30 days, thus not completing their primary phase, after being assessed and found eligible for ADATSA in the Fall of 1989.

The Results

Over the five year follow-up period, treated clients cost, on average, $4500 less in medical care than untreated clients. A closer look at each individual year after treatment suggests that this result is not an artifact of one or two unusual years. Our cost savings figure compares very favorably with the $2300 invested in an average treatment episode.

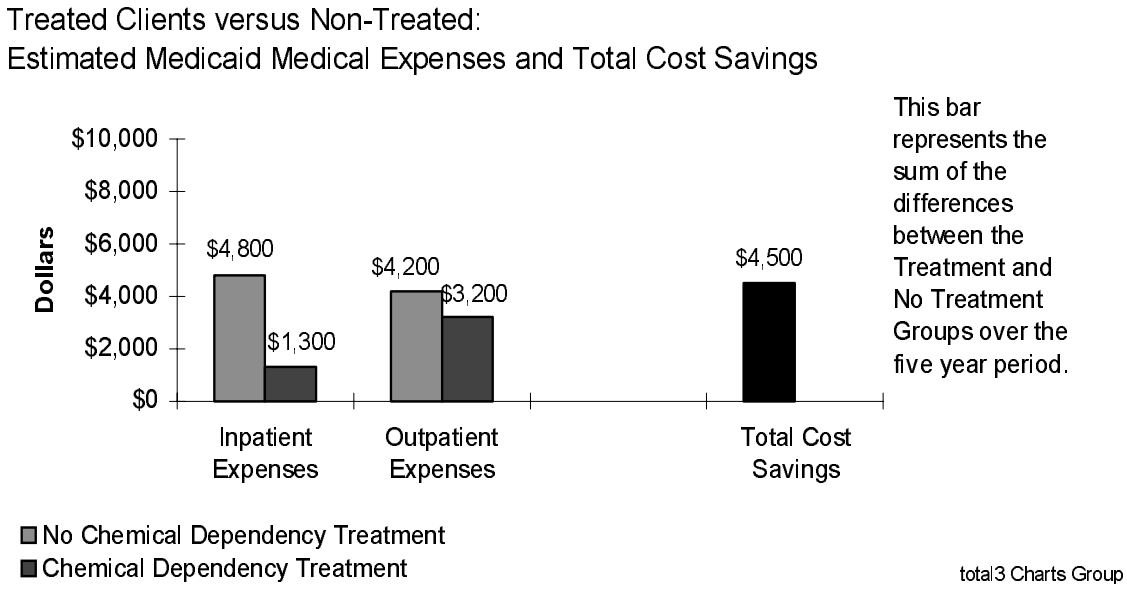
Patterns among different types of clients are interesting. Treatment has the largest effect, and produces the largest savings, for those who had Medicaid medical expenses prior to chemical dependency treatment. Treated clients who had Medicaid medical expenses prior to treatment cost, on average, $7900 less than a similar group of untreated clients over the five year follow-up period.

One notable fact about Medicaid medical expenses is that they are incurred by relatively few clients. However, the expenses of those few clients can be very large. Our research is a quasi-experimental design, where we compare naturally occurring treatment and comparison groups. It is possible that a few very expensive clients in that comparison group might be responsible for the savings we found. If so, our results would not be valid. To insure that our estimate of $4500 in cost savings over five years was not the result of a few unusual cases, the most expensive clients were dropped from the analysis, and the cost estimates recalculated. The recalculated estimates were only slightly less than our original figures; the difference between the two was less than $100. This fact increases the confidence we have in our original estimate.

Savings in Medicaid Medical Costs After Chemical Dependency Treatment

Question: What are the average cost savings in Medicaid medical expenses?

- Over the five year follow-up period, **the average treated client had Medicaid medical costs that were $4,500 less than those of the average untreated client**: $3,500 less in hospital expenses plus $1,000 less in outpatient medical expenses.



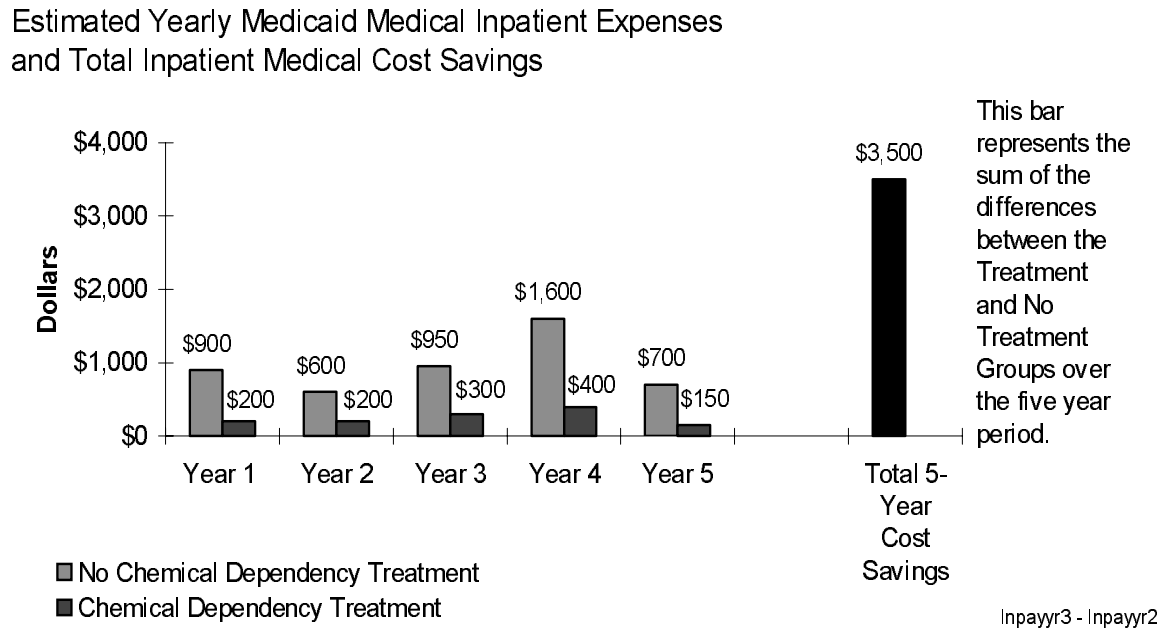
- The amount of savings in Medicaid medical costs compared very favorably with the $2,300 amount spent on average for chemical dependency treatment in 1989-90. Expenses for further chemical dependency treatment and support are yet unknown for the whole five year period, but were only $500 for the first follow-up year.

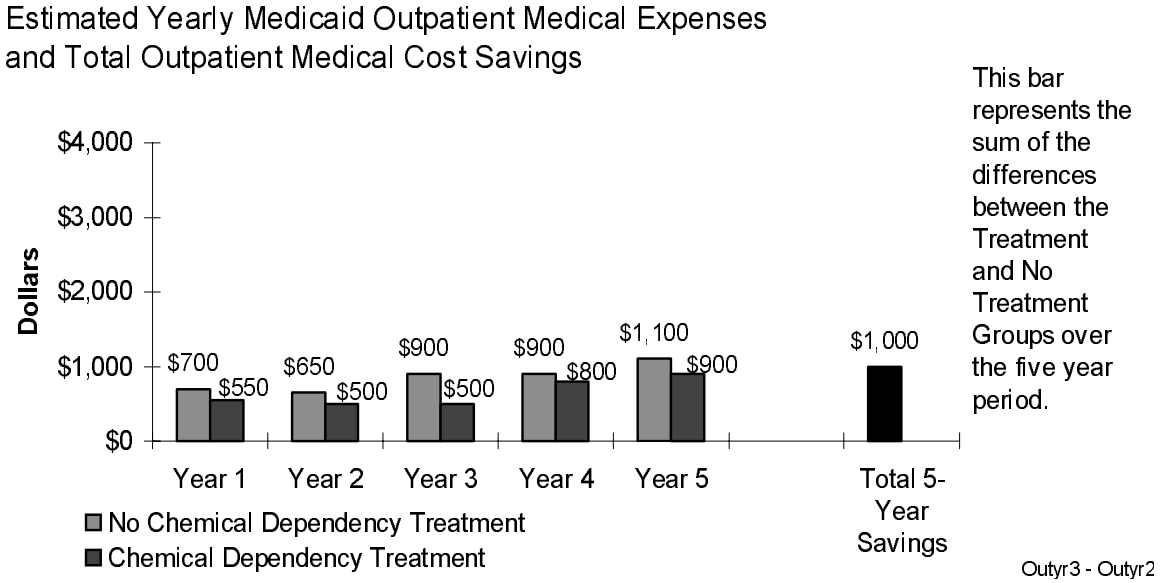
Yearly Medicaid Medical Expenses and Savings

Question: The five year results, presented previously, raise a question. Are they the product of one or two very unusual years?

To answer this question, we must examine Medicaid medical expenses on a yearly basis.

- While there is variation across time, treated clients cost less than untreated clients in each of the follow-up years, for both inpatient and outpatient expenses. Thus, treated clients produce savings consistently over time.





Subgroup Differences in Expenses and Savings

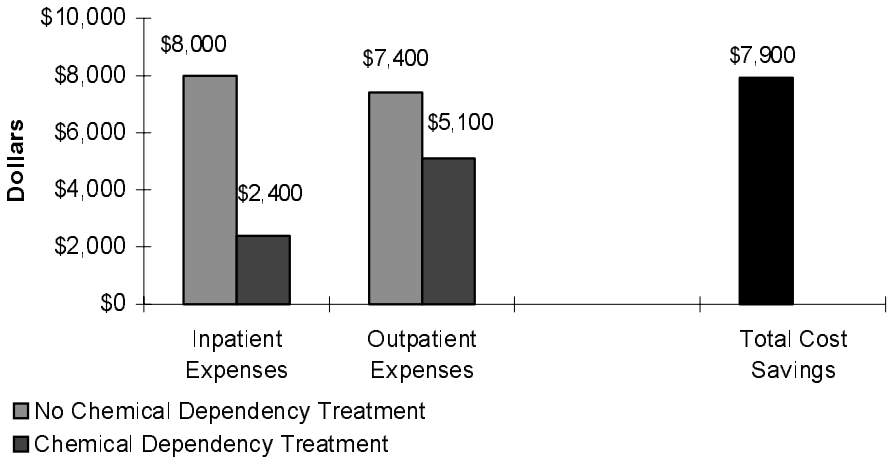
Question: Are the effects of chemical dependency treatment constant across all groups of clients?

- Chemical dependency treatment is particularly beneficial for two groups of clients, those with prior Medicaid expenses, and women.

Clients with and without Medicaid Medical Expenses Prior to Treatment

- Chemical dependency treatment is associated with greatly reduced costs for those who incurred medical expenses before treatment: $7,900 overall cost savings over the 5 year follow-up period. However, treated clients who did not have medical expenses prior to treatment still cost less: $800 overall cost savings over the same time period.

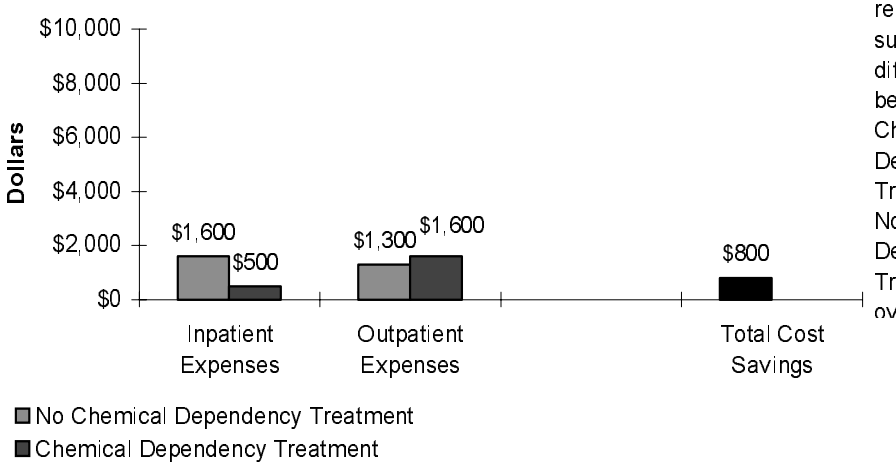
Clients with Prior Medicaid Medical Expenses:
Estimated Medicaid Expenses and Total Cost Savings



This bar represents the sum of the differences between the Chemical Dependency Treatment and No Chemical Dependency Treatment Groups over the five year period.

total3- Charts Group

Clients Without Prior Medicaid Medical Expenses:
Estimated Medicaid Expenses and Total Cost Savings



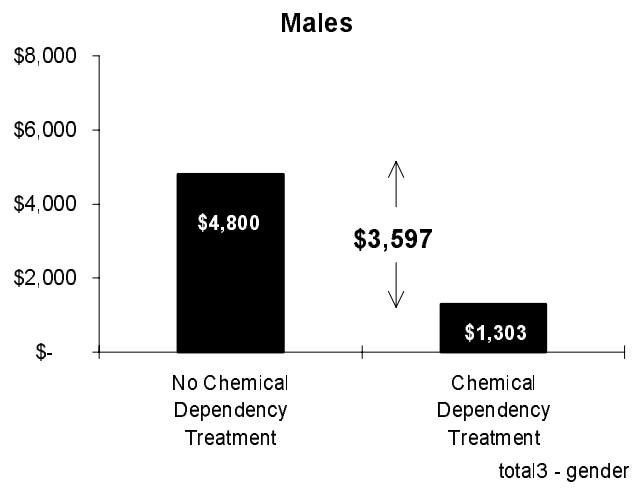
This bar represents the sum of the differences between the Chemical Dependency Treatment and No Chemical Dependency Treatment Groups over the five year

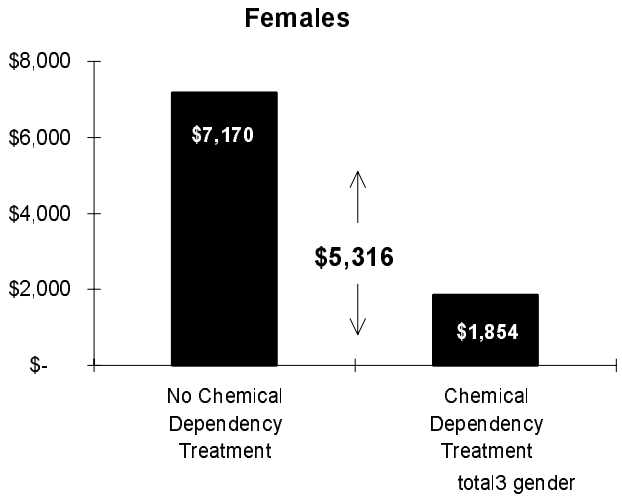
total3 - Charts Group

Gender Groups

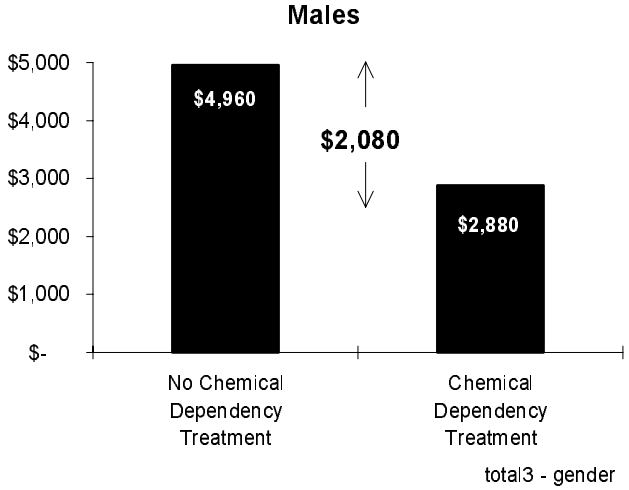
- While both males and females have lower Medicaid medical expenses if treated for chemical dependency, the differences are not equal. The savings for treated males is larger than the savings for treated females in outpatient expenses ($2,000 for males versus $600 for females), while the reverse is true for inpatient costs. **Treated females cost over $5000 less than untreated females in inpatient medical costs over the five year period while treated males cost about $3,500 less than untreated males for the same inpatient medical costs .**

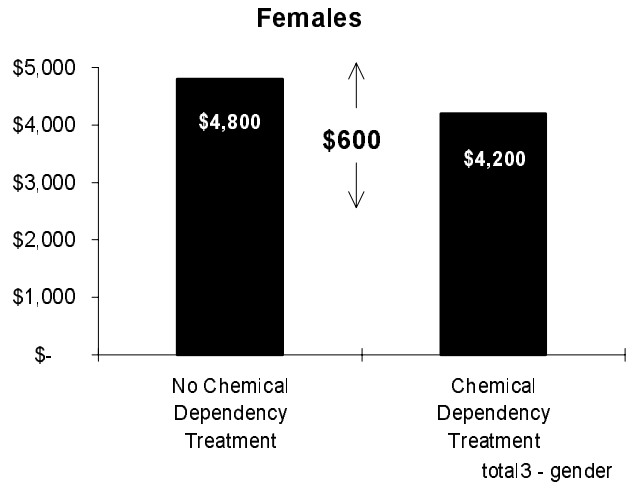
Inpatient Medical Expenses





Outpatient Medical Expenses





There are no available data currently to differentiate between the possible reasons for these gender differences in type of Medicaid savings. Further data are being collected on income assistance, treatment re-entry and Medicaid eligibility over the five year period. These data may shed some light on the above findings.

Appendix

Data Sources

Data for this study came from the following two computerized data systems that are operated within Washington State's Department of Social and Health Services (DSHS).

MMIS: The Medicaid Management Information System records eligibility, utilization and reimbursement information for medical services available to low income persons in Washington State and is operated by the Medical Assistance Administration. While Medicaid pays for some chemical dependency treatment and some mental health services, our interest was strictly in medical services and their costs.

SAMS: The Substance Abuse Management System was operated by the Division of Alcohol and Substance Abuse until 1993, when it was succeeded by the Treatment and Assessment Report Generation Tool (TARGET). Both systems contain information about chemical dependency services provided to publicly funded clients, including assessment, residential treatment, and outpatient treatment. This treatment is designed to assist in the recovery of alcohol or drug addiction. Data include a wide variety of client characteristics, treatment activities, information about those who provide treatment, and discharge status.

Creating a dataset to analyze involves matching data on individual clients from both of these systems. In general, this process involves determining which variables identify clients in each system (for example, name, date of birth, Social Security number), and which of those variables are held in common by both systems. If an appropriate common variable does not exist, matching from one system to another often means creating a variable which is typically a composite of a number of client identifiers common to both systems. While it is necessary to have some means of identifying clients to match information from different sources, all client data are kept confidential.

The Process of Determining the Magnitude of Treatment Effects

Step 1: Minimizing the Problem of Selectivity Through Careful Selection of Treatment and Comparison Groups

Differences in motivation or disposition may occur as clients select themselves to receive or not receive treatment. This is the crux of the selectivity problem. If motivation and disposition are not the same in both treatment and comparison groups, differences in outcomes may be due, not to the effectiveness of treatment, but to unequal levels of motivation. Such differences are difficult to eliminate. In a retrospective design differences in these factors can be minimized by the careful choice of a comparison group and by reducing differences between treatment and comparison groups through statistical regression analysis.

The clients in this study who received no treatment shared with clients who completed treatment (primary or all phases) the fact that they sought public assistance at a local Community Service Office (public assistance office). Given an appointment for an ADATSA assessment, they showed up to meet with an ADATSA counselor at the Assessment Center. They were then assessed and considered eligible for treatment. Up to this point motivational factors should have been similar.

The possible differences due to selectivity lie in the fact that comparison group clients did not accept (and/or were not accepted for) a particular treatment path or did not show up for treatment (about two out of three clients in this group). However, two findings from our earlier report suggest that these differences may be minor and unrelated to treatment outcomes:

- Client profiles changed little from eligibility to starting and completing treatment. In particular, only two out of fifteen factors significantly decreased the chances of starting treatment: having physical or mental problems (Longhi et. al., 1991: 58-63).

- Clients having court-ordered assessments were just as likely as other clients to start treatment, complete treatment and become employed. Since legal coercion is presumed to have different consequences on motivation than voluntarily seeking help, this finding calls into question the role of motivation in obtaining treatment and in achieving certain treatment outcomes.

Step 2: The Final Statistical Model and the Effects of Treatment

Pre-treatment differences in client characteristics can be controlled for, or adjusted statistically, as long as these characteristics are measured. Six background variables were available for all clients: Sex (Male/Female); Race (White/Non-white); Age (less than 30/over 30); Marital Status (Married/Other); Education (HS=12 years/ less than 12 years); and Prior Employment (Average Wages in the Two Years Prior to Assessment).

The second step was a statistical model that incorporated the additive and/or interactive effects of background variables and treatment. This model statistically tests for overall effects of treatment among all clients (i.e. additive effects) regardless of background characteristics.

Statistical models in regression analyses take the form of :

$$y = b_o + b_1x_1 + b_2 x\ 2 \text{ ---- } b_n\ x_n + e$$

The terms in this equation are as follows:

y is the dependent variable (outcome)
x_1 through x_n are the independent variables (client background characteristics and treatment)
e is an error term
b_1 through b_n are the coefficients which depict the independent effects of background variables and treatment of each variable on the dependent variable (outcome).

Step 3: The Calculation of Adjusted Medicaid Medical Expenses: The Magnitude of Treatment Effects

The last step is to present the results of the statistical model in the most understandable form. This means showing the outcome levels achieved by the average client in both groups assuming clients in these groups had the same background characteristics. We chose to define the average ADATSA client as someone who had the average value on pre-treatment characteristics of all clients, both treatment and comparison group. The adjusted outcomes of treatment for this average client are the outcomes they would have achieved had all ADATSA assessed and eligible clients received treatment. These adjusted outcomes also approximate the most probable effects of a randomized assignment of ADATSA clients to a treatment and a control group had we conducted an experimental study rather than a retrospective one.

To calculate the point estimates of Medicaid outcomes, we began with the values for pre-treatment characteristics of our hypothetical average client. Then, we multiplied the values by the appropriate regression coefficient, which indicates the expected effect of that characteristic on the outcome.

In statistical terminology this step is referred to as calculating the estimated, predicted or expected values of Medicaid expenses. By using values of the average client in this calculation, we minimize differences due to client characteristics. The difference between the adjusted outcomes for the two groups constitutes the statistically estimated or adjusted effect of treatment.

Variables

Sex: A dichotomous variable coded with a 1 for males and a zero for females.
White: A dichotomous variable coded with a 1 for whites and zero for non-whites.
Prior Inpatient Medical Costs: Inpatient (hospital) costs incurred in the 12 months prior to treatment.
Prior Outpatient Medical Costs: Outpatient costs incurred in the 12 months prior to treatment.
Medical Costs During Chemical Dependency Treatment: All Medicaid medical costs incurred during the chemical dependency treatment period.

Generalizing Our Findings

These findings pertain to nearly all ADATSA clients, (84%), but AFDC recipients were excluded because of some unique conditions. First, 78% of that subgroup is female, and 17% of those were pregnant at the time of assessment. As expected, pregnant clients incurred large medical expenses, and the source of those expenses, whether from the mother or infant, cannot be determined. Also, we have no data on pregnancies after treatment, and their effect on medical costs. These factors confound any attempt at analysis, and weaken any relationship that might exist between treatment and subsequent Medicaid costs.

The Division of Alcohol and Substance Abuse (DASA) within the Department of Social and Health Services (DSHS) serves many different types of clients, and this study examines only those served by the ADATSA Program. Generalizations should be confined accordingly, and not projected to all clients receiving DASA services.

Costs of Treatment

Treatment costs refer only to the costs of ADATSA treatment in the first treatment episode after being assessed in the Fall of 1989. Information on further costs of treatment, due to re-entry subsequent to the first episode, have been collected only for the first year of the five year follow-up period.

Other ADATSA Reports

Published Reports:

The ADATSA Program: Clients, Services and Treatment Outcomes
A Study of Indigent Persons Served by Washington State's Alcoholism and Drug Addiction Treatment and Support Act, Longhi, et. al., Report Number 4.17, October 1991.

ADATSA Treatment Outcomes: Employment and Cost Avoidance
An Eighteen Month Follow-Up Study of Indigent Persons Served by Washington State's Alcoholism and Drug Addiction Treatment and Support Act, Longhi, Brown and Comtois, Report Number 4.19, November 1994.

ADATSA Follow-up Study of Extended Outpatient Care
A Comparison of 90 Days versus 180 Days of Outpatient Treatment for Clients of Washington State's Alcoholism and Drug Addiction Treatment and Support Act, Vanderhyde, Kamara et. al., Report Number 4.21, November 1995.

Statistical Model of

Inpatient Medical Expenses After Treatment

The Effects of Client Characteristics, Pre-Treatment Experiences and Chemical Dependency Treatment

Independent Variables	All Clients Regression Coefficients	Some Prior Medicaid Expenses Regression Coefficients	No Prior Medicaid Expenses Regression Coefficients
CLIENT CHARACTERISTICS			
AGE	36.24	-11.05	22.51
SEX	-4342.80 **	-4531 *t*	-1387.80 *t*
WHITE	221.31	-343.90	674.63 *t*
PRIOR INPATIENT COSTS	.10 *	.07	
DURING TREATMENT COSTS	1.09 ***	.98 *	.19
TREATMENT AND TREATMENT INTERACTIONS			
TREATMENT	-5985.89 ***	-7756.58 **	-1887.02 *t*
TREATMENT AND SEX	3503.94 *	3802.78	1006.91
TREATMENT AND PRIOR INPATIENT COSTS	-.15 *t*	-.14	
R-Square	.10	.09	.03

* Significance at $\alpha < .05$ level

** Significance at $\alpha < .01$ level

*** Significance at $\alpha < .001$ level

t Significance at $.05 < \alpha < .20$

Statistical Model of

Outpatient Medicaid Expenses After Treatment

The Effects of Client Characteristics, Pre-Treatment Experiences and Chemical Dependency Treatment

Independent Variables	All Clients Regression Coefficients	Some Prior Medicaid Expenses Regression Coefficients	No Prior Medicaid Expenses Regression Coefficients
CLIENT CHARACTERISTICS			
AGE	35.50	35.74	30.19
SEX	-1855.23 *t*	-1995.74	-782.39
WHITE	350.80	16.96	752.25
PRIOR OUTPATIENT COSTS	3.77 ***	3.68 ***	
DURING TREATMENT COSTS	1.10 ***	1.06 **	-0.07
TREATMENT AND TREATMENT INTERACTIONS			
TREATMENT	-345.00	893.08	-746.93
TREATMENT AND SEX	-80.68	-2241.93	1385.30
TREATMENT AND PRIOR OUTPATIENT COSTS	-1.60 **	-1.87 *	
R-Square	.42	.46	.014

* Significance at $\alpha < .05$ level

** Significance at $\alpha < .01$ level

*** Significance at $\alpha < .001$ level

t Significance at $.05 < \alpha < .20$