Employment Outcomes among AFDC Recipients Treated for Substance Abuse in Washington State

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THE MAJOR WELFARE PROGRAM PROVIDING FINANCIAL assistance to poor families in the United States has been Aid to Families with Dependent Children (AFDC). Created more than 60 years ago, this federal-state program was intended to provide a minimal income to poor families with needy children, defined by the program as "children deprived of parental support or care because their father or mother is absent from the home continuously, is incapacitated, is deceased, or is unemployed" (Page and Larner 1997). Federal legislation required states to provide cash assistance to all eligible families. Working within federal limitations, the states administered the program, established the income levels below which families qualified for assistance in that state, and set the level of benefits that eligible families would receive there. The size of the AFDC program, and its costs, grew over time. In 1996, almost 14 million individuals, including 9 million children, received AFDC assistance nationwide, and total program costs (administration plus benefit payments) reached almost $26 billion (ACF 2000).

In an effort to move people off welfare and establish strong incentives to work, Congress passed the Personal Responsibility and Work Opportunity Act in 1996, abolishing the AFDC program and replacing

it with the Temporary Assistance to Needy Families program (TANF). Under TANF, states are required to design their own welfare programs, meeting federal criteria, using cash block grants that reflect their past spending levels. Important programmatic features of TANF are: (1) the requirement that all adult recipients work or perform community service, and (2) the five-year lifetime limit imposed on welfare payments to families. States may exempt up to 20 percent of the welfare caseload from this five-year limit, but otherwise are required to cut off welfare support after an eligible individual reaches the five-year maximum.

TANF assumes that AFDC recipients can, over time, successfully shift from welfare dependence to economic self-sufficiency. Since TANF was implemented, welfare rolls have shrunk by an unexpected degree under highly favorable labor market conditions. The longer-term effects of TANF remain uncertain, however. In particular, it is unclear whether welfare recipients—primarily poor single women with children—will actually be able to achieve and sustain employment at the levels needed to provide adequate economic support for themselves and their families. Achieving the goals of TANF will be even more difficult for welfare recipients with substance abuse problems. At a minimum, the rehabilitation needs of these individuals will have to be addressed through treatment. Currently almost nothing is known about the effects of treatment on employment among AFDC recipients.

The scope of the substance abuse problem within the welfare population is unclear. One recent national study found that prevalence rates among AFDC recipients for alcohol abuse/dependence (approximately 4–12 percent) and drug abuse/dependence (approximately 3–6 percent) were similar to those of the general population (Grant and Dawson 1996). However, other studies have reported higher prevalence rates for alcohol and/or drug abuse (Sisco and Pearson 1994; Chasnoff, Landress and Barrett 1990; Schmidt, Weisner and Wiley 1998). The prevalence of alcohol and drug abuse appears to vary among welfare populations. One study (Schmidt, Weisner and Wiley 1998) found the prevalence of substance abuse in a northern California county was higher among recipients of general assistance than among AFDC recipients. This same study found no strong direct link between substance abuse and welfare dependency among AFDC recipients over the six-year period of analysis. Other studies, however, have found evidence of a link between substance abuse and welfare dependency, and have documented the significant barriers to employment posed by substance abuse (Kaestner 1998; Substance Abuse

and Mental Health Services Administration 1997; U.S. Department of Health and Human Services 1997).

Other research conducted in a variety of settings on different populations during the same period found that chemical dependency treatment does have a positive effect on employment outcomes. Early analyses conducted on data gathered through the Drug Abuse Reporting Program (DARP) and the Treatment Outcome Prospective Study (TOPS) (Sells 1974; Hubbard, Marsden, Rachal, et al. 1989), as well as other studies (McLellan, Luborosky, O'Brien, et al. 1982; French, Zarkin, Hubbard, et al. 1991), found positive effects of treatment in promoting employment and enhancing earnings. Studies conducted in Washington State on indigent clients whose treatment was publicly supported also showed positive effects of treatment on employment outcomes (Longhi, Brown, and Chapman 1994; Wickizer, Joesch, Longhi, et al. 1997; Brown, Longhi, and Luchansky 1998). While important, these studies do not provide information about the effect of treatment on employment among AFDC clients.

Study Aims and Context

The purpose of this study was to evaluate the effects of substance abuse treatment on employment outcomes among AFDC recipients admitted to treatment in Washington State during a two-year period beginning July 1994. A secondary aim was to demonstrate the utility of state-level computer databases for conducting evaluation research and outcome studies. The specific questions we sought to address were:

1. What is the general pattern of earnings and welfare payments before and after treatment?
2. Is exposure to treatment associated with improved employment outcomes?
3. Does time on welfare prior to treatment affect employment outcomes?

In addition, because TANF was implemented August 1997 in Washington State and our earnings data extended through the third quarter of 1998, we were able to examine income trends for our AFDC client population through the first year of TANF implementation.

The recent implementation of broad health and social welfare initiatives, including TANF and the Children's Health Insurance Program (CHIP), has focused increased attention on the problems of substance abuse and mental illness, and on the need for better understanding of outcomes among clients who utilize treatment and prevention services as part of these initiatives. States play a critical role administering these programs and have a pressing need for timely, reliable information on treatment outcomes for program management purposes and policy formulation. The challenge facing states is how to generate this information at an affordable cost. Few states have the resources—or luxury of time—to conduct costly studies involving large-scale primary data collection. Such studies often take years to complete and produce information that may be of diminished value, given the rapid changes in policy or programmatic circumstances occurring in most states. An alternative approach is to track client outcomes by analyzing data provided by state computer databases.

Methods

We identified the study population by searching the client treatment database maintained by the Washington State Division of Alcohol and Substance Abuse (DASA) to identify individuals admitted to state-supported treatment from July 1994 through June 1996 who reported being on AFDC at time of admission. This search procedure resulted in the initial identification of 5,514 clients (not including 620 clients who received detox). Subsequently, 476 (9.0 percent) of these clients were dropped from the potential subject pool because (1) they had a dual diagnosis (mental illness and substance abuse), or (2) they had incomplete data on key variables, for example, discharge date or treatment modality.

The remaining 5,038 AFDC clients had been admitted to six different treatment modalities. Three of these treatment modalities had sufficient numbers of admissions to permit analysis: outpatient treatment, intensive 21- or 28-day (non-hospital-based) inpatient treatment, and methadone maintenance. Outpatient treatment consists of a variety of diagnostic and treatment services provided according to a prescribed treatment plan in a nonresidential setting. The treatment services delivered through this modality include individual counseling, group counseling, family therapy, and vocational services. Intensive inpatient

treatment is a highly structured program for chemically dependent persons in a residential setting. Inpatient treatment services emphasize alcohol and drug education and individual and group therapy. Methadone maintenance provides opiate substitution treatment in an outpatient setting. Methadone programs provide counseling and administer methadone on a daily or near-daily basis. During the two-year study period, 3,784 AFDC clients received outpatient treatment, 706 received intensive inpatient treatment, and 299 received methadone treatment.

Selection of Treatment and Comparison Groups

One important limitation of using secondary data to evaluate treatment outcomes concerns the selection of treatment and comparison groups. Usually, as was the case here, information is available only on clients admitted to treatment, making it impossible to construct a nontreated equivalent comparison group. The challenge is to construct comparison groups that can provide a valid basis for analyzing treatment effects. As discussed more fully below, selection bias is a significant potential problem under these circumstances.

Our approach was to develop treatment and comparison groups on the basis of treatment exposure. Treatment groups within each of the three modalities (outpatient, intensive inpatient, and methadone) consisted of clients who completed treatment or who remained in treatment for a specified amount of time. Comparison-group clients consisted of clients who received no treatment other than detox, or clients who terminated treatment early. Thus, in effect, we evaluated the impact of treatment exposure, comparing clients having more exposure (treatment group) with other clients having less exposure (comparison group). Some clients (approximately 20 percent) were admitted to treatment more than once during the two-year study period. We defined the index admission as the first admission and evaluated the client's employment outcomes on the basis of this initial admission, following the principle of intention to treat.

The inclusion criteria used to select the treatment and comparison groups within each of the three modalities analyzed are outlined below:

Outpatient treatment

- First admission, no prior treatment
- Treatment group—minimum of 90 days of continuous treatment
- Comparison group—maximum of 21 days of continuous treatment

Inpatient treatment

- First admission or received prior detox only
- Treatment group—completed 21- or 28-day inpatient treatment regimen
- Comparison group—clients admitted to detox only who received no other treatment

Methadone maintenance

- First admission or received prior detox only
- Treatment group—completed minimum of 120 days of methadone maintenance treatment
- Comparison group—completed maximum of 60 days of methadone maintenance treatment

Application of these inclusion criteria yielded a study population of 3,173 AFDC recipients who received treatment for chemical dependency between July 1994 and June 1996. The number of clients selected for the treatment or comparison groups within each of the modalities were: outpatient—treatment group, 870, comparison group, 1,131; inpatient—treatment group, 629, comparison group, 260; and methadone maintenance—treatment group, 106, comparison group, 177. As described above, time in treatment served as the criterion used to define the treatment and comparison groups. Using this criterion was problematic for the inpatient comparison group because few inpatient clients (<10 percent) drop out within the first several days of treatment. Thus, for inpatient treatment, there was no appropriate comparison group representing clients that had minimal time in treatment. Instead, we selected for the inpatient comparison group clients who had detox but no further treatment during the study period.

Selected characteristics for the AFDC study population are shown in table 1. The average age at admission was 31. Approximately 75 percent of the clients were white, 12 percent were black, and 8 percent were Native American. Three of every four clients were female. The AFDC clients admitted to treatment had limited education, with almost 40 percent having no educational degree. Almost 50 percent of the clients reported that alcohol was their primary substance of abuse. Thirteen percent of the clients reported heroin was their primary substance of

TABLE 1
Selected Characteristics of AFDC Study Population ($n = 3,173$)

Characteristic	Mean or % (standard deviation)
Age at admission	31.1
	(7.0)
Race (%)	
White	73.1
Black	11.9
Native American	7.8
Asian and other	7.1
Female (%)	74.7
Single, divorced, widowed or separated (%)	79.7
Education (%)	
No degree	36.6
High school degree only	52.7
Vocational training or post–high school	8.5
Other	2.3
Primary substance of abuse (%)	
Heroin	13.4
Cocaine	14.5
Methamphetamines	10.6
Alcohol	47.8
Other drugs	13.7
Frequency of drug/alcohol use (%)	
Daily	34.6
Weekly	34.8
Less than weekly	30.6
Intravenous needle users (%)	32.9
Admissions prior to July 1994 (%)	
0	78.9
1–2	19.0
>2	2.1
Quarters on welfare during six-quarter period prior to treatment	3.6
	(2.4)
Clients employed part-time year prior to treatment (%)	43.9
Average annual earnings among clients employed year prior to treatment	$1,033
	($1,452)

abuse, while 15 percent reported abusing cocaine most frequently. At the time of admission, the average AFDC client had been on welfare for 3.6 quarters during the six quarters prior to treatment. Finally, 44 percent of the clients had some part-time employment during the year prior to treatment, earning an average of $1,033.

Data and Measures

Three state computer databases provided data for our analysis. The client treatment database, described earlier, provided information on client characteristics, date of admission and discharge, and treatment activities. The data obtained from this database included the following variables: age, gender, race, education, primary substance of abuse, frequency of use, past mental health treatment, referral source, living arrangement, number of children in household, marital status, disability status, general health status, and household income.

We obtained employment data in the form of quarterly earnings for July 1993 through September 1998 (21 quarters) from the computer records of the Employment Security Department. Welfare payment data in the form of monthly cash grant amounts were obtained from the Economic Services Administration of the Department of Social and Health Services. The welfare payment data spanned 48 months, from July 1993 through June 1997. To facilitate the analysis and make the two data sources compatible, we converted (aggregated) the monthly welfare payment data to quarterly data.

The employment data spanned a sufficient amount of time to enable us to track employment outcomes over a two-year (eight-quarter) period following treatment and to construct baseline earnings measures representing the year prior to admission. Because the welfare data ended in June 1997, we were able to track welfare payments for six quarters posttreatment only for clients who were discharged by January 1996.

To assess the effect of treatment on employment outcomes, we analyzed three dependent measures constructed from the earnings data. The first measure was a binary variable that indicated if a client had any positive (>0) earnings during the two-year posttreatment follow-up period. The second measure, also a binary variable, indicated if a client had earnings of at least $2,500 or more during the follow-up period.

The third measure, annualized earnings (measured in nominal dollars), captured the combined effects of the number of hours worked and the hourly rate of pay over the two-year follow-up period. (Reliable data on the actual number of hours worked were not available.)

A number of unmeasured factors affected monthly welfare payments. For example, if an AFDC recipient changed residences, his or her housing allowance might have changed. Similarly, Washington State had certain work requirements in force during the study period. Failure to adhere to these work requirements might have resulted in sanctions and a reduction in welfare payments. Because we could not control for the effects of these factors, we did not analyze welfare payments or welfare status in relation to treatment. We do present descriptive information on welfare payments (measured in nominal dollars) and explore the relationship of welfare payments to earnings.

Statistical Analysis

We begin by presenting descriptive information showing patterns in earnings and welfare payments over time before and after treatment, then use multivariate analysis to examine employment outcomes in relation to treatment. Logistic regression was used to determine the effects of treatment on the likelihood of becoming employed during the follow-up period, with 1 representing any employment (earnings > 0) and 0 otherwise. A second logistic regression model was estimated to examine the effects of treatment on the a client's likelihood to gain more substantive employment. For this equation, employment was defined as having earnings of $2,500 or more during the follow-up period. We used multiple linear regression to estimate the effect of treatment on the annualized earnings of clients who became employed (earnings > 0) during the follow-up period. Although the earnings measure exhibited some skewness, estimating the model with earnings measured in log form had no effect on the results. We therefore proceeded to estimate the model with earnings measured in nominal dollars.

The data we obtained from the client treatment database allowed us to control for differences in a number of variables that we believed might be related to treatment status and employment outcomes and thus act as confounders. These variables, along with their form of measurement,

are:

- Race   categorical
- Gender   binary
- Age at admission   continuous
- Marital status   categorical
- Household size   continuous
- Number of treatment
  admissions prior to July 1994   continuous
- Prior mental health treatment   binary
- Primary substance of abuse   categorical
- Frequency of abuse   categorical
- Needle use   binary
- Education level   categorical
- Seeking employment at
  time of admission   binary

In addition to the above variables, our regression models included a variable that measured baseline earnings the year prior to treatment.

As part of our study, we also examined the interactive effects of time on welfare and treatment. This allowed us to compare the effects of treatment on earnings for AFDC clients who had been on welfare prior to treatment for shorter (one to three quarters) versus longer (four to six quarters) time periods. The interactive model was estimated only for outpatient treatment, as the other two treatment modalities had insufficient numbers of clients to yield reliable parameter estimates.

A major question we confronted in conducting our analyses was the effects of selection arising from the specification of the treatment and comparison groups. There is some likelihood that clients in our treatment and comparison groups differed on characteristics we could not measure. If these characteristics were correlated with both treatment status and employment outcomes, selection bias would occur. Statistical methods have been developed to address problems of selection in evaluation research that relies on observational studies, but these methods could not be incorporated practically into the current analysis, given the data available to us. We considered the use of instrumental variables (Newhouse and McClellan 1998), but could not identify a variable that could serve as an adequate instrument for treatment yet have no direct effect on employment outcomes. Models that employ differencing techniques allow one to "difference out" the effects of time-invariant unmeasured factors.

But these models require longitudinal data with sufficient observations on each case to ensure reliable estimation. They also have the distinct disadvantage of eliminating the opportunity to obtain estimates of the effects of time-invariant factors that may be of interest, such as gender, race, and education. Other selection models, such as the Heckman procedure (Winship and Mare 1992), can be used under certain conditions if sufficient information exists to identify the selection equation. Given the limited secondary data available to us, it was not feasible to examine employment outcomes through standard selection models.

Despite our ability to control for differences in a number of factors that might influence both treatment status and employment outcomes, potential selection remains a concern for this analysis. Accordingly, readers should use caution interpreting the results presented below.

Results

Profile of Earnings and Welfare Payments before and after Treatment

Quarterly earned income declined the year before the AFDC clients entered treatment, and increased thereafter (fig. 1). Earnings reached a maximum eight quarters after treatment, but even at this point the average AFDC client had quarterly earnings of only $800, or $267 per
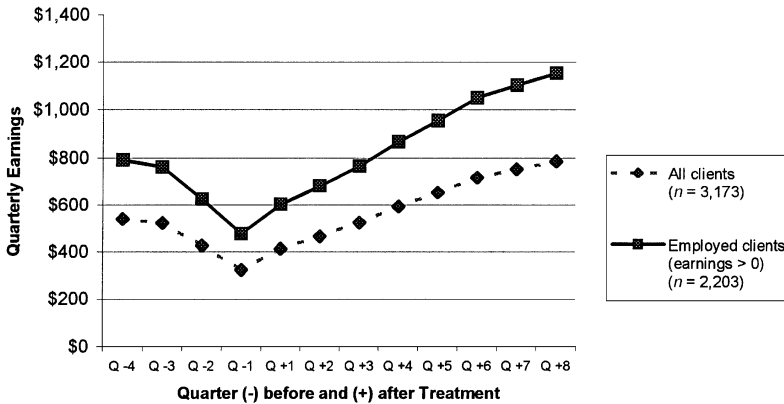

FIG. 1.   Quarterly earnings before and after treatment among AFDC clients treated for substance abuse in Washington State.

month. The lower line in figure 1 represents all 3,173 clients in the study population, including approximately 1,000 clients who had zero earnings throughout the 12-quarter pre- and posttreatment tracking period. Restricting the analysis to clients who had some labor force participation (earnings > 0) would increase the average quarterly earnings by approximately 30–40 percent, as shown by the upper line in figure 1. However, the average quarterly earnings were still very modest, on the order of $1,200, or $400 per month, eight quarters after treatment.

Earnings among the AFDC clients varied by education level and ethnic group. Clients with a high school degree or post–high school training earned substantially more than clients with no degree. By eight quarters after treatment, AFDC clients with a high school degree earned 35 percent more than the clients with no degree. Asian AFDC clients had higher quarterly earnings than whites, blacks, or Native Americans. The average earned quarterly income for Asian AFDC clients eight quarters posttreatment was approximately $900. The corresponding quarterly income for whites, blacks, and Native Americans was $810, $580, and $605, respectively.

The percentage of clients who became employed after treatment differed among the three treatment modalities, as shown in table 2. Sixty-six percent of the AFDC clients in the inpatient treatment group had some positive earned income posttreatment, as compared with 61 percent of clients in the outpatient treatment group and 50 percent of those in the methadone treatment group. The corresponding percentage figures for the inpatient, outpatient and methadone comparison groups were 50, 57, and 38 percent, respectively.

The annualized earned income for AFDC clients who had some labor force participation (earnings > 0) varied as well (table 2). Clients in the outpatient treatment group had the highest annualized earnings over the two-year follow-up period ($5,340), followed by clients in the methadone treatment group ($4,824). Clients in the inpatient treatment group had annualized earnings of $4,501. The corresponding income figures for AFDC clients in the respective comparison groups were $3,469, $2,554, and $3,322. Even though AFDC clients in the three treatment groups earned more than their comparison group counterparts ($p < .05$), conclusions about the influence of treatment is unwarranted because these income figures are not adjusted for differences in gender, race, education, prior treatment, pretreatment employment, or other factors.

TABLE 2
Employment Outcomes for Two-Year Follow-up by Modality

	Modality					
	Inpatient		Outpatient		Methadone	
Outcome measure	Treatment group ($n = 629$)	Comparison group ($n = 260$)	Treatment group ($n = 870$)	Comparison group ($n = 1131$)	Treatment group ($n = 106$)	Comparison group ($n = 177$)
Client employed (earnings > 0) during follow-up period (%)	66**	50	61	57	50	38
Client employed (earnings ≥ $2,500) during follow-up period (%)	41**	27	40**	30	29*	15
Average annual earnings during two-year follow-up period for clients with some employment (earnings >0)	$4,501 ($6,635)[a]	$3,322 ($4,028)	$5,340** ($7,188)	$3,469 ($4,832)	$4,824* ($6,223)	$2,554 ($3,940)

$p \leq .05$; ** $p \leq .01$.
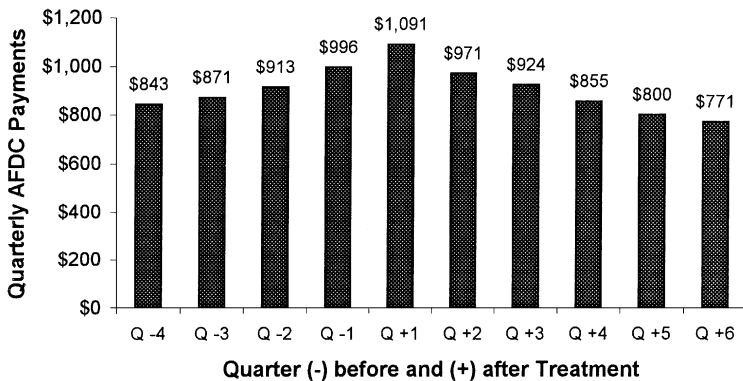[a] Standard deviation is given in parentheses.

FIG. 2.   AFDC quarterly payments before and after treatment ($n = 2,429$).

Further insight into the employment experience of this AFDC client population can be gained by examining the distribution of aggregate (total) income over the two-year follow-up period. Forty-two percent of the 3,173 AFDC clients had no earned income (excluding welfare transfer payments) in the follow-up period, 14 percent had $1 to $1,000, 12 percent had $1,001 to $3,000, 12 percent had $3,001 to $8,000, 9 percent had $8,001 to $15,000, and 11 percent had $15,001 or more.

The amount of welfare support (cash grants) received by the AFDC clients over the 10-quarter tracking period (4 quarters before treatment and 6 quarters after treatment) is shown in figure 2. As noted earlier, our analysis of welfare payments is based on 2,429 AFDC clients discharged from treatment by January 1996. The pattern in the figure shows modestly increasing welfare payments before treatment and decreasing payments after treatment. Four quarters prior to treatment, the quarterly cash grant amount for the average client was $843. The amount increased to $1,091 one quarter after discharge and then declined thereafter, reaching a minimum of $771 at six quarters after discharge.

As discussed earlier, a number of factors, including a change in family size or a change in living arrangement, could affect welfare payments. Because information regarding these factors was unavailable, we refrain from comparing treatment and comparison groups with regard to welfare payments. It is instructive, however, to explore whether, and the extent to which, employment reduced clients' dependence on welfare.

During the study period, AFDC recipients in Washington State were allowed to supplement their welfare payments with earned income. In

fact, even before TANF, Washington State had certain work requirements for some welfare recipients. One would expect that as earned income increased, reliance on welfare would decrease. We examined the correlation between income and welfare payments among the 2,429 AFDC clients depicted in figure 2, and also analyzed the difference in welfare payments over the six-quarter posttreatment tracking period (fig. 2) for clients with annualized earnings above and below $2,500. A complex formula was used to determine the amount of offset to a client's welfare grant payment if he or she had earned income. The offset was not dollar for dollar, however. An AFDC recipient's grant payment was reduced less than the amount of income he or she earned, and it occurred on a lagged basis (three months after the reported earnings). Thus, one would expect a negative, though modest, correlation between earnings and welfare grant payments.

Income and welfare payments were found to be negatively correlated ($r = -.24$, $p < .001$). The average client with annualized earnings of less than $2,500 had mean welfare payments of $5,929 during the six-quarter posttreatment tracking period. In contrast, the average client with earnings over $2,500 had welfare payments of $3,829 ($p < .001$). Thus it appears that employment, even at a modest level, decreased reliance on welfare.

Effects of Treatment on Employment Outcomes

Our analysis of employment outcomes in relation to treatment, based upon logistic regression analysis, is presented in table 3 in the form of abridged results. Two employment measures are shown: any employment (earnings > 0) and substantive employment (earnings $\geq$$2,500). The logistic regression models estimated for this analysis controlled for differences in the variables previously described in the methods section. As shown in table 3, treatment exposure was positively associated with an increase in the likelihood of becoming employed. Five of the six odds ratios shown were statistically significant and generally ranged from 1.2 to 1.9. Thus, treatment clients, on average, had a 20–90 percent better chance of becoming employed than clients in the comparison group. Other variables also influenced the likelihood of a client becoming employed, but, with few exceptions, their influence was modest. The most important factor was the client's pretreatment employment

TABLE 3

Abridged Results of Logistic Regression Showing Odds Ratios for Becoming
Employed during Two-Year Follow-up Period

Treatment modality	Any employment			Employment resulting in earnings ≥ $2,500		
	Adjusted OR[a]	CI$_{95}$	p value	Adjusted OR[a]	CI$_{95}$	p value
Outpatient treatment ($n = 2,001$)	1.20	0.99–1.45	.065	1.58	1.29–1.94	<.001
Inpatient treatment ($n = 889$)	1.77	1.26–2.50	.001	1.62	1.12–2.32	.01
Methadone treatment ($n = 283$)	1.88	1.09–3.25	.02	2.87	1.43–5.61	.002

[a] The treatment variable was coded 1 = treatment group, 0 = comparison group. The adjusted odds ratio (OR) therefore gives an estimate of the odds of becoming employed for the average client in the treatment group relative to the comparison group, controlling for differences in other variables. For example, clients in the outpatient treatment group had a 20 percent greater chance (OR = 1.20), on average, of having any employment during the follow-up period than outpatient comparison group clients.

experience, as measured by baseline earnings during the year prior to treatment. For every $100 earned in the year before treatment, the odds of becoming employed improved by roughly 12 percent, other things being equal. Native Americans were significantly less likely ($p < .01$) to become employed. Having a high school degree was generally associated with an increase in the odds of becoming employed ($p < .05$). Previous mental health treatment was found to decrease the odds of becoming employed. In general, the frequency of substance abuse or the type of substance abused had little effect on employment. However, needle use was associated with a decreased likelihood of becoming employed ($p < .05$).

For clients who did become employed during the follow-up period (earnings > 0), we examined the association between treatment exposure and annualized earnings (table 4). Each of the three treatment modalities exhibited a positive association between the two. The estimated treatment coefficients were statistically significant and of large enough magnitude to be of practical significance. The estimated outpatient

TABLE 4
Association between Treatment Exposure and Annualized Earnings for AFDC
Clients with Some Labor Force Participation

Variable	Outpatient treatment (n = 1, 200) coefficient (S.E.)	Inpatient treatment (n = 541) coefficient (S.E.)	Methadone treatment (n = 121) coefficient (S.E.)
Constant	696	1978	−5111
	(786)	(1511)	(5181)
Baseline earnings	2.14***	2.64***	0.55
	(0.122)	(0.152)	(0.426)
Unemployed but seeking	−263	123	1270
employment at time of admission	(361)	(539)	(1056)
Age at admission	22.2	21	33
	(23.8)	(36)	(91)
Male	2230***	−369	−1318
	(396)	(519)	(1237)
Black[a]	−213	26	221
	(517)	(706)	(1250)
Native American	−289	−583	−1637
	(641)	(815)	(5101)
Asian/other	−348	13.14	−2225
	(532)	(877)	(2130)
High school degree[b]	696**	385	100
	(330)	(467)	(1212)
Post−high school or	855	2092***	4529**
vocational training	(589)	(809)	(1800)
Other education	142	610	760
	(925)	(1881)	(3687)
Married	316	−500	991
	(417)	(548)	(1217)
Number of children in	114	219	−223
household	(131)	(179)	(497)
Received prior outpatient	−334	−1559	−1154
mental health treatment	(688)	(1026)	(1842)
Needle user	−361	−524	732
	(405)	(496)	(4099)
Weekly abuser[c]	−253	−91	4930
	(336)	(683)	(3042)
Daily abuser	−340	−72	5149**
	(438)	(656)	(2546)
Heroin abuser[d]	−77	−1956**	−210
	(967)	(926)	(2296)

Cocaine abuser	−120	−1477**	510
	(479)	(588)	(4447)
Methamphetamine abuser	225	448	—[e]
	(530)	(706)	
Other drug abuser	−582	−1125*	—[e]
	(437)	(683)	
Treatment exposure	1802***	1001*	2246**
	(312)	(587)	(1029)

[a] White is the omitted variable.
[b] No degree is the omitted variable.
[c] Less than weekly is the omitted variable.
[d] Alcohol abuser is the omitted variable.
[e] No methadone clients reported these substances as primary substance of abuse.
*p ≤ .10; **p ≤ .05; ***p ≤ .01 (two-tailed tests).
Note: R^2 values for the outpatient, inpatient, and methadone treatment equations are, respectively, 0.31, 0.42, and 0.25.

coefficient implies that the average AFDC client staying in treatment for 90 or more days (treatment group) who became employed would have approximately $1,800 more in annualized earnings than the average client who remained in outpatient treatment for 21 days or less (comparison group). Similarly, the coefficients for the inpatient and methadone treatment modalities (table 4) suggest that the average client in the treatment groups of these modalities would have approximately $1,000 and $2,250 more in annualized earnings than the average client in the respective comparison groups.

Other variables included in the regression analysis had a mixed effect on treatment. The variable most strongly related to posttreatment annualized earnings, except for methadone clients, was pretreatment baseline earnings. Clients who were employed before treatment also tended to become employed after treatment, independent of other factors. Male outpatient AFDC clients had significantly higher ($p < .001$) earnings than female clients. Education was associated consistently with greater earnings: AFDC clients who had a high school degree or who had vocational training or other post–high school education had greater earnings than clients with no educational degree.

One of the questions we sought to address through this study was whether the amount of time on welfare prior to treatment affected the annualized earnings of AFDC clients. We explored this question in a limited fashion for AFDC clients in the outpatient treatment modality
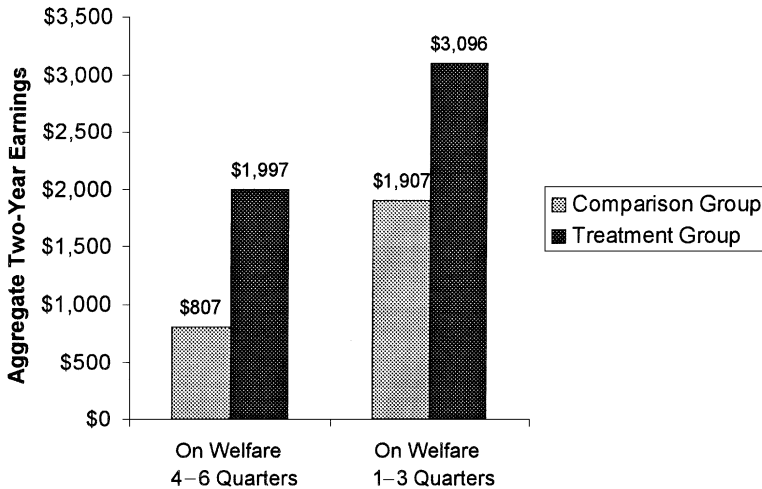
FIG. 3. Predicted annualized posttreatment earnings among outpatient clients with varied pretreatment time on welfare.

(the larger number of outpatient clients improved the precision and reliability of the estimates) by testing the same model as represented in table 4 with an interactive term added to capture the effects of time on welfare (time on welfare was interacted with the treatment variable). This analysis enabled us to compare the effects of outpatient treatment exposure for AFDC clients on welfare for one to three quarters prior to treatment versus four to six quarters prior to treatment. The results are summarized in figure 3.

Time on welfare proved to have a substantial effect on posttreatment earnings. AFDC clients on welfare for four or more quarters prior to treatment had lower annualized earnings during the two-year follow-up period than clients who were on welfare for one to three quarters. Nonetheless, treatment was associated with increased earnings. Clients on welfare for four to six quarters who received 21 days or less of outpatient treatment (comparison group) had predicted annualized earnings of $807 over the two-year follow-up period as compared with $1,997 for clients who received 90 days or more of treatment ($p < .05$). We found comparable and statistically significant differences for clients on welfare for less time, except the level of predicted earnings among these clients was substantially higher (fig. 3).

Summary and Conclusions

To our knowledge, this study is the first to report detailed data on income, welfare payments, and treatment effects for AFDC clients with substance abuse problems. Such data acquire added importance because of recent changes in the nation's welfare system. States now have much greater responsibility for administering welfare-to-work programs. Fulfilling this responsibility requires a better understanding of the impact of services and interventions, including substance abuse treatment, that have been developed to assist welfare recipients in their efforts to achieve greater self-sufficiency.

This study had two aims. The first was to document the effects of substance abuse treatment on employment and earnings among AFDC clients admitted to treatment in Washington State during a two-year period beginning July 1994. The second aim was to demonstrate the utility of state computer databases for conducting evaluation and tracking client outcomes.

Given the observational nature of the data used for this analysis, readers should use caution in interpreting the study's results. Although we were able to control for a number of factors—most importantly, pretreatment earnings—unmeasured differences between clients in the treatment and comparison groups may have introduced some unknown bias into the analysis.

Employment Outcomes

Our analysis showed that treatment was associated with increased employment and earnings. Relative to the comparison groups, AFDC clients in the treatment groups were more likely to become employed following treatment. Statistical estimates suggest that treatment also had a favorable effect on earnings for clients who became employed. These findings are notable, especially in light of the fact that the primary goal of treatment is rehabilitation, not employment. The length of time on welfare appeared to exert a negative effect on clients' earnings following treatment. Clients on welfare for longer periods prior to treatment earned less, although exposure to treatment appeared to increase earnings nonetheless.

While treatment appeared to enhance employment and earnings among AFDC clients, the level of earnings achieved remained modest,
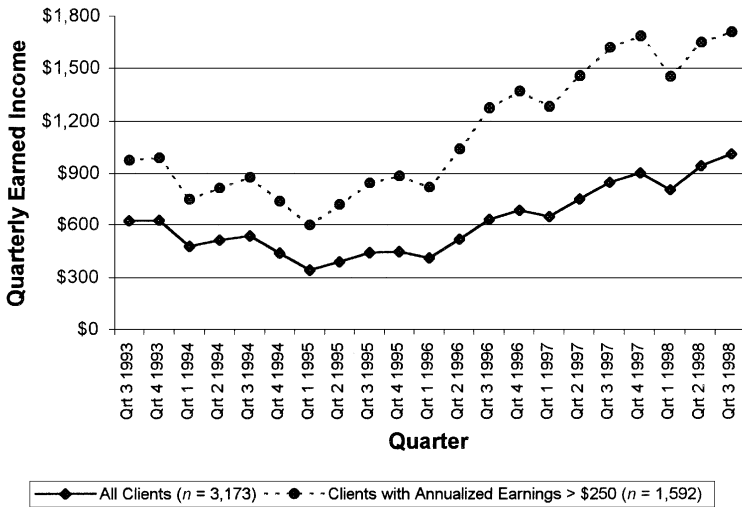
FIG. 4. Income trends among AFDC recipients treated for substance abuse in Washington State through the first year of TANF implementation.

at best, with 42 percent of all clients having no earned income in the two-year follow-up period and an additional 14 percent having less than $1,000 of earned income.

Recent federal welfare reform (TANF) has introduced strong incentives to work. Thus, clients today may be earning somewhat more than the data reported in our study suggests. TANF was implemented in Washington State during the third quarter of 1997. Because our employment data cover the period through September 1998, we were able to assess, in a limited fashion, the trends in earnings over time among our AFDC client population with reference to the time of TANF implementation. Figure 4 shows the average quarterly earnings from the third quarter of 1993 through the third quarter of 1998 for all AFDC clients ($n = 3,173$) and for clients who had some labor force participation, as measured by posttreatment annualized earnings of $250 or more during the tracking period ($n = 1,592$). As figure 4 shows, average quarterly earnings did increase modestly after the implementation of TANF, but the upward trend in earnings started well before TANF implementation. Despite the incentives of TANF directed toward employment, the level of earned income that these AFDC clients achieved was very modest. By the third quarter of 1998, the average quarterly income among all 3,173 clients was $1,013. Even if one considers only clients with some

labor force participation, as represented by the upper line in figure 4, the level of earned income in the third quarter of 1998 was still quite modest—$1,710, or $570 per month.

The goals of employment and self-sufficiency underpinning TANF may be achievable for only a small minority of welfare recipients with addiction and substance abuse problems, unless ancillary vocational services are provided along with treatment. Earlier studies from Washington State indicate that vocational services enhance employment and earnings when delivered in conjunction with treatment (Brown, Longhi, and Luchansky 1998). In the absence of these services, the outlook is not promising, notwithstanding the findings reported here. There is a very real possibility that clients who are unable to obtain employment may be forced to rely on other local and state health and welfare systems once their time allotment for financial assistance under TANF is exhausted. If so, the costs of operating these systems will increase, perhaps substantially.

Using State Computer Databases for Tracking Outcomes

One of the objectives of this study was to demonstrate the utility of state computer databases for tracking client outcomes. State agencies are under increased pressure to demonstrate accountability for their budgets, and have to plan and administer substance abuse programs in the face of rapidly changing environments. These needs require the capability to perform timely analyses and outcome evaluations at a reasonable cost. A recent conference, sponsored by the Agency for Healthcare Research and Quality (AHRQ, formerly the Agency for Health Care Policy and Research [AHCPR]) and conducted in Albuquerque in June 1999, brought together senior state-level officials to discuss and examine issues related to substance abuse and mental health within the context of broader health and social welfare initiatives. A prominent theme running through this meeting was the critical need for better and more timely information regarding the impact of substance abuse and mental health treatment and prevention services. Time and again, conference participants emphasized the importance of having reliable, timely information on outcomes for program management and policy formulation.

State computer databases contain client-level information representing important outcome indicators of substance abuse treatment, including employment, public assistance payments, Medicaid utilization and

expenditures, and criminal justice data. As such, these databases represent a potentially valuable resource for the development of state-level systems to track client outcomes and perform evaluation studies, notwithstanding the important methodological issues that arise when secondary data, obtained from computer databases, are analyzed.

The increasing complexity of the policy and program environments surrounding substance abuse treatment systems is placing more emphasis on the timely evaluation and analysis of their outcomes. By utilizing the information available in their computer databases, states can greatly improve their capacity to perform evaluation and outcome studies.

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