

# Improving 24-Month Abstinence and Employment Outcomes for Substance-Dependent Women Receiving Temporary Assistance for Needy Families With Intensive Case Management

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Substance use disorders are among the most prevalent and costly national health problems. Addressing substance use disorders among low-income mothers has special importance because of the vulnerable nature of the population and the higher prevalence rates of substance use disorders than for other women.<sup>1–4</sup> The passage of welfare reform legislation heightened concerns about the well-being of low-income mothers with substance use disorders and opened new opportunities for system change. Under Temporary Assistance for Needy Families (TANF) regulations, women who fail to participate in mandated work activities face sanction and loss of benefits. At the same time, welfare reform granted much greater latitude to states to develop comprehensive support services, including funding substance use disorders treatment.<sup>5</sup>

Recent reviews note that women with substance use disorders represent a minority of TANF populations but experience more severe and persistent barriers to employment and are less likely to become employed than are their counterparts without substance use disorders.<sup>6,7</sup> There is a consensus that women with substance use disorders who receive TANF need services that are more intensive than the rapid labor force attachment approach typically found in welfare settings.<sup>8</sup> However, there is an absence of research to guide states in evaluating policy and program options.

In an earlier study, we reported on substance use outcomes comparing 2 policy-relevant options for women receiving TANF who were diagnosed with substance dependence: (1) a substance use disorders screen-and-refer program, and (2) a substance use disorders screen-and-refer program augmented by intensive case management (ICM) and vouchers.<sup>9</sup> Substance use disorders screen-and-refer models screen applicants in welfare offices for substance use disorders with paper and pencil screening measures. Applicants screening positive are assessed for substance use disorders, and if treatment is

**Objective.** We examined abstinence rates among substance-dependent women receiving Temporary Assistance for Needy Families (TANF) in intensive case management (ICM) over 24 months and whether ICM yielded significantly better employment outcomes compared with a screen-and-refer program (i.e., usual care).

**Methods.** Substance-dependent (n=302) and non-substance dependent (n=150) TANF applicants in Essex County, New Jersey, were recruited. We randomly assigned substance-dependent women to ICM or usual care. We interviewed all women at 3, 9, 15, and 24 months.

**Results.** Abstinence rates were higher for the ICM group than for the usual care group through 24 months of follow-up (odds ratio [OR]=2.11; 95% confidence interval [CI]=1.36, 3.29). A statistically significant interaction between time and group on number of days employed indicated that the rate of improvement over time in employment was greater for the ICM group than for the usual care group (incidence rate ratio=1.03; 95% CI=1.02, 1.04). Additionally, there were greater odds of being employed full time for those in the ICM group (OR=1.68; 95% CI=1.12, 2.51).

**Conclusions.** ICM is a promising intervention for managing substance dependence among women receiving TANF and for improving employment rates among this vulnerable population. (*Am J Public Health.* 2009;99:328–333. doi: 10.2105/AJPH.2007.133553)

deemed necessary, clients are mandated to a substance use disorders treatment program. This screen-and-refer approach for women with substance use disorders who apply for benefits is the most common strategy that states employ.<sup>10</sup>

Although screen-and-refer programs focus on case identification and triage to substance use disorders treatment, evidence strongly supports the consideration of more-intensive interventions. Studies of women with substance use disorders who receive TANF indicate high rates of co-occurring mental health and social problems that are not likely to be addressed in substance use disorders treatment.<sup>11,12</sup> In addition, newer conceptualizations of substance use disorders as a chronic illness suggest that interventions should provide extended monitoring over time; coordination of services may improve outcomes when added to standard substance use disorders treatment.<sup>13,14</sup>

In our earlier study, we found that substance-dependent women receiving TANF in ICM had significantly higher levels of access and retention in substance use disorders treatment and were almost twice as likely to be abstinent 15 months following study entry than were those assigned solely to a screen-and-refer option. In our current study, we had 2 primary aims: to examine whether early group main effects for abstinence were sustained over longer-term follow-up (16–24 months) and to test whether ICM yielded significantly better employment outcomes when compared with screen and refer.

To the best of our knowledge, no previous study has reported employment outcomes among women who formerly received TANF either in substance use disorders screen-and-refer programs or in ICM. Testing the effectiveness of policy-relevant interventions for low-income mothers with substance use disorders is

vitality connected to health issues post-welfare reform. Women who fail to achieve employment are subject to sanction and loss of social safety net benefits, including Medicaid coverage. Also, programs with demonstrated effectiveness in helping women with substance use disorders gain employment, rather than simply become abstinent, are more likely to receive additional resources from welfare agencies.<sup>15</sup>

In addition, we had 1 secondary aim. We examined whether previous abstinence predicts later employment outcomes. A guiding supposition among welfare and substance use disorders treatment professionals is that abstinence from mood-altering substances is a necessary first step toward gaining employment.<sup>16</sup> Surprisingly, previous studies have not reported a strong relationship between abstinence and employment outcomes.<sup>17</sup> However, no study has examined this hypothesis in a post-welfare reform context.

## METHODS

We used routine self-report drug-use screening procedures (which were part of determining TANF benefit eligibility) to identify substance-dependent women in welfare offices. We evaluated women who screened positive for substance use disorders for study selection criteria. In addition, we recruited and followed a comparison sample of women receiving TANF who did not meet criteria for substance use disorders in the previous 5 years. Our aim in collecting these data was to provide a means of benchmarking the employment outcomes of substance-dependent women against a sample of women without substance use disorders who received TANF. Accordingly, we asked women who screened negative for substance use disorders to participate in the study as a non-affected, comparison sample. Thus, the study examined employment outcomes for 3 groups: a usual care group, an ICM group, and a comparison sample.

Of those substance-dependent women who agreed to participate and proved to be eligible, 1 group received referrals to a treatment program and welfare services (usual care). The other group received ICM in addition to the substance use disorders treatment and other services available to the usual care group.<sup>9</sup> The comparison sample received services offered to all welfare recipients.

### Participants

We collected data on a sample of 302 substance-dependent and 150 non-substance

dependent women receiving TANF. We recruited participants from welfare offices in an urban area, Essex County, New Jersey. Recruitment procedures and the demographics for both the substance-dependent and non-substance-dependent samples have been described in detail elsewhere.<sup>9,18</sup> Other than substance dependence status, analyses revealed that the substance-dependent and comparison samples demonstrated significant demographic differences.<sup>18</sup> The substance-dependent sample comprised women who were significantly older, more likely to be Black, had more children, and had been on welfare a greater number of years compared with the comparison sample.<sup>18,19</sup> These demographic differences are consistent with those found in a study of a representative sample of TANF clients in New Jersey post-welfare reform.<sup>20</sup>

Formal selection criteria for all participants were (1) being TANF eligible, (2) having entered New Jersey's welfare-to-work program without being deferred for a medical problem, and (3) being able to speak English well enough to complete an interview. In addition, the substance-dependent women were identified and eligible for the study if they also met criteria for a *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*<sup>21</sup> (DSM-IV), substance dependence diagnosis. Women in the comparison sample did not meet criteria for any substance use disorder in the previous 5 years. Furthermore, we excluded women from the study if they were psychotic, receiving or seeking methadone treatment, seeking long-term residential treatment, or currently stably engaged in substance abuse treatment.

### Study Interventions

We randomly assigned women in the substance-dependent sample to 1 of the 2 treatment groups: usual care or ICM. Study interventions and the monitoring of treatment fidelity and discriminability are described in further detail elsewhere.<sup>9</sup>

ICM was a manual-guided intervention (the manual is available upon request). During the first phase of ICM, case managers identified tangible barriers to treatment entry and provided needed services. Once clients entered treatment, case managers assisted treatment facility staff by coordinating needed services and met with clients weekly. Clients also received vouchers as incentives for attending substance use disorders treatment. Case manager contact with clients was monitored and devoted to each person according to need and phase of treatment. Case management services

were provided throughout the 24-month follow-up period.

Women randomly assigned to the usual care group met with a clinical care coordinator who reviewed their need for substance use disorders treatment and referred them to care. If clients failed to attend a first session of treatment, outreach was limited to several phone calls and letters. Clients had the option of returning for reassessment during the 24 months of study participation.

### Measures

We determined substance use diagnoses with the DSM-IV Structured Clinical Interview.<sup>22</sup> The alcohol and drug portions of the Addiction Severity Index–Expanded Female Version provided the core measure of baseline substance use and severity.<sup>23</sup>

The timeline followback<sup>24</sup> was the primary measure of substance use and employment. We collected substance use data for each day from the date of the baseline to obtain a continuous record of use and to construct a dichotomous measure of abstinence (abstinent or not) for each month of the 24-month follow-up period. Monthly rates of absolute abstinence were the primary outcome measure. We confirmed self-reported substance use via collateral interviews and urine tests at 3, 9, and 15 months. Agreement between self-report and other methods ranged from 87.2% to 95.5%. Thus, findings suggest that self-report of substance use was valid.<sup>9</sup>

Along with substance use, we collected data on the number of days employed per month on the timeline followback. We constructed 3 monthly employment outcome variables: any employment within a month, number of days employed during the month, and employment of 19 days or more within the month (we considered this an indicator of full-time employment). We considered a month valid if there were at least 10 days of data available. For those partial months that we considered valid, we extrapolated missing data for the remainder of the month from the existing data. Fewer than 1% (79 of 10 728 months observed) of data were imputed.

### Procedures

Clinicians conducted baseline assessments for the substance-dependent sample, and research staff conducted all other interviews. A random number generator was used to determine assignment to a treatment group, and the assignments were sealed in an envelope. Envelopes

were opened after the baseline assessment was completed to ensure that clinicians were blinded to group assignment while conducting the baseline assessment.

All participants received in-person or telephone follow-up interviews 3, 9, 15, and 24 months after baseline assessment. Details on follow-up retention rates through month 15 have been published elsewhere.<sup>9</sup> Of the original 302 substance-dependent participants who received a baseline assessment, 284 (94%) received a 24-month follow-up interview. Of the 150 participants in the comparison sample, 141 (94%) received a 24-month follow-up assessment.

### Analytic Plan

We applied methods (e.g., generalized estimating equations) in our analysis appropriate for a longitudinal panel design.<sup>25</sup> The analytic plan comprised 4 steps. In step 1, we tested whether abstinence outcomes associated with group assignment were maintained in months 16 through 24. With the same procedures as in our previous work,<sup>9</sup> we modeled complete abstinence from all substances for each month of the follow-up period. In this model, we treated abstinence as a binary outcome, assuming a binomial distribution and logit link function.

In step 2, we undertook a process of model building<sup>26</sup> in which we examined the association between sets of sociodemographic, human capital, and substance use severity with employment. The following covariates had a marginal statistical association ( $P < .10$ ) and were retained in subsequent models: having a high school diploma or the equivalent, recent work experience, and baseline drug use severity.

In step 3, we examined whether group assignment was associated with employment outcomes. We selected days employed a priori as our outcome measure because it can be modeled as a count variable rather than a simple dichotomy, thus providing a more discriminating dependent measure. We determined a priori that if a group significantly predicted the days employed, we would test the other employment measures. We first modeled days employed as a Poisson distribution, which yielded a poor model fit.<sup>27</sup> We then modeled the data with negative binomial regression models with a log link function that provided a good model fit. After finding a statistically significant association between group and number of days a person was employed during a month, we also examined whether this association would also be significant if employment outcome was

measured as any day of work within a month and as any full-time employment during a month.

In step 4, we examined the prospective association between abstinence and outcomes in 2 ways: (1) we modeled whether the proportion of days abstinent in the first 12 months was associated with the number of employed days per month in the second year, and (2) we used time-varying covariates to test whether abstinence in a preceding month was associated with employment days in a following month (i.e., a prospective association between 1 month and the next). We conducted all analyses with Stata 9.2 software.<sup>28</sup>

## RESULTS

Baseline characteristics of the sample have been described elsewhere.<sup>9</sup> Briefly, the group did not differ on sociodemographic or addiction severity measures at baseline except that ICM clients were older (mean=37.0 years; SD=6.6 years) than usual care clients (mean=35.5 years; SD=8.1 years).

Figure 1 depicts the proportion of individuals within each group who were abstinent. The mean abstinence rate across the months for the ICM group was significantly higher than that for the usual care group (odds ratio [OR]=2.11; 95% confidence interval [CI]=1.36, 3.29). Additionally, there was a significant interaction between group and time, indicating that the differences in abstinence rates among those in ICM were growing over the assessment period (OR=1.05; 95% CI=1.02, 1.09).

Figure 2 depicts the average number of days worked, by group, with superimposed lines derived from the negative binomial models. The model-derived lines demonstrate that the model provides a good fit to the data and highlight that differences in employment days diverge over time. In the multivariate analyses, there was not a main effect for group but a statistically significant interaction between time and group (incidence rate ratio [IRR]=1.03; 95% CI=1.02, 1.04), indicating that the rate of improvement over time in employment for the ICM group was greater than for the usual care group. In post hoc analyses, we found that there were significant time  $\times$  group interactions for having any work days in a month (OR=1.03; 95% CI=1.01, 1.04). There was a main effect of individuals in the ICM group having greater odds of being employed full-time (OR=1.68; 95% CI=1.12, 2.51) as well as a significant interaction between group and time that was indicative of a greater rate of increase in full-

time employment for the ICM group over time than that for the usual care group (OR=1.05; 95% CI=1.03, 1.07).

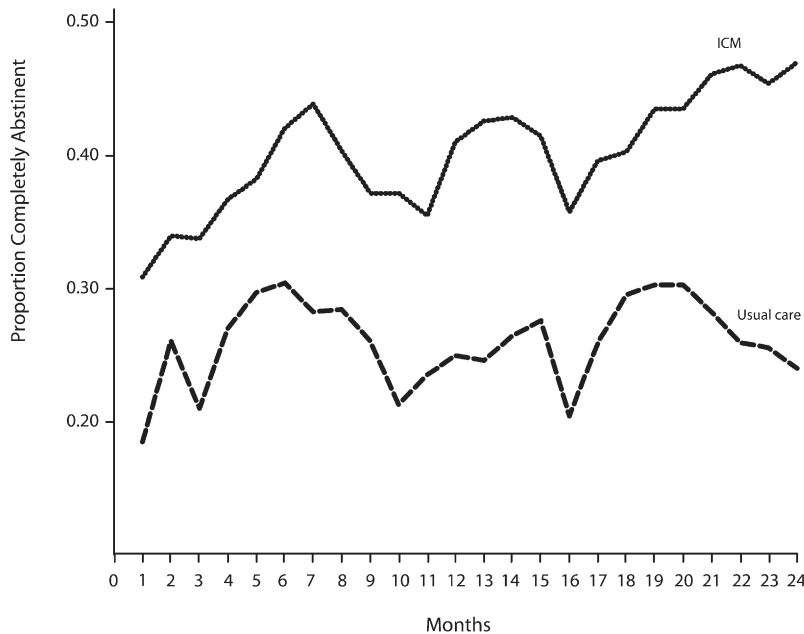
For illustrative purposes, employment rates across 3 measures of employment for ICM and usual care as well as for the comparison sample are shown for the past 3 months of follow-up (Table 1). Two observations emerged from these data. First, the substance-dependent groups had lower rates than did the comparison group of having any employment or full-time employment. Second, differences between the ICM and usual care groups grew across the months.

The proportion of days abstinent in year 1 was significantly associated with the count of days worked by month during the second year of follow-up (IRR=1.01; 95% CI=1.00, 1.02). A crude interpretation of this IRR would be that for every 30 days of abstinence in year 1, a person in 1 of the substance dependence groups would have 9% more employment days per month than would someone who was not abstinent. When examined as a time-varying covariate, previous month employment was significantly associated with the number of days worked in the following month (IRR=1.43; 95% CI=1.25, 1.60).

Figure 3 depicts abstinence rates among those who worked each month within the substance-dependent groups. These results suggest 2 observations. First, those working in the ICM group showed a trend of increasing abstinence over time, whereas the trend for those in usual care was relatively flat. Second, by the end of the follow-up period, more than three fifths of the ICM participants who were working were also abstinent, whereas approximately one third of the working participants in usual care were completely abstinent.

## DISCUSSION

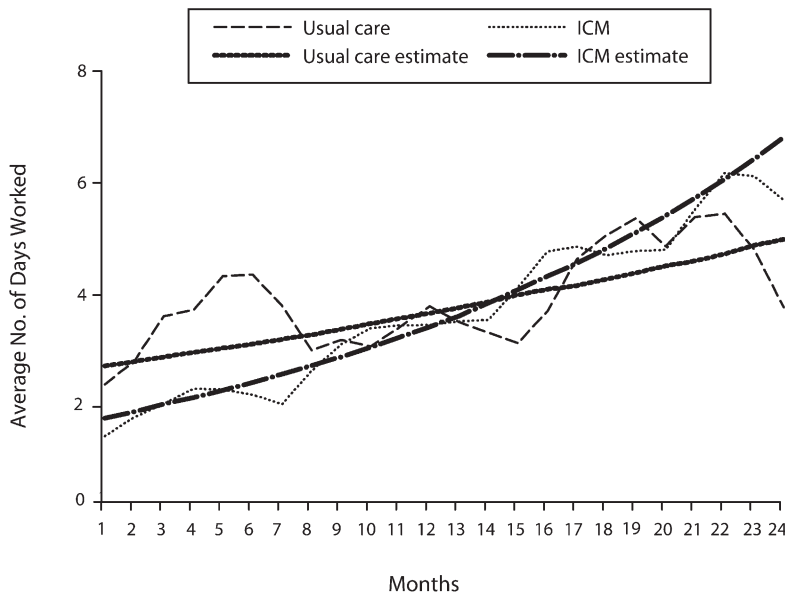
Our findings provide support for the effectiveness of ICM in increasing rates of longer-term abstinence and employment among drug-dependent women receiving TANF when compared with those in the screen-and-refer model. Group differences in abstinence rates during the past 9 months of follow-up (months 16–24) significantly widened, with clients in usual care, on average, having lower rates at month 24 compared with month 15 and those in ICM having higher rates. In month 24, abstinence rates in ICM (47%) were almost twice those in usual care (24%). Significant employment effects for ICM emerged during



**FIGURE 1—Monthly prevalence of complete abstinence among substance-dependent women assigned to intensive case management (ICM) or usual care: Essex County, New Jersey, September 1999–May 2004.**

the second year of follow-up for all employment outcomes tested and appeared to widen toward the end of the follow-up period.

Although the magnitude of the overall group differences for employment were more modest than for abstinence, group differences in a key



Note. Estimate derived from a regression equation.

**FIGURE 2—Average number of days worked each month among substance-dependent women assigned to intensive case management (ICM) or usual care: Essex County, New Jersey, September 1999–May 2004.**

employment indicator—full-time employment—during months 23 and 24 ranged from an OR of 1.7 to an OR of 3.2. In addition, early abstinence significantly predicted later employment. As we noted in a previous article, a number of study features (e.g., random assignment, excellent follow-up rates) strengthen study internal validity.<sup>9</sup> Importantly, the control group—screen and refer—is the standard of care in many welfare settings and not an artificially weak comparison.

**Interpretation**

Results showing that the magnitude of ICM effects do not weaken through 24 months are consistent with earlier findings of ICM benefits over the first 15 months of follow-up, even though the most-intense case management and treatment activities occurred during the first 3 months of the intervention.<sup>9</sup> The strengthening of effects found during the past 9 months was not hypothesized but is intriguing. It may be that case managers help clients to avert crises and relapse via the availability of monitoring and flexible provision of services outside the context of formal treatment. In addition, it may be that abstinence and employment have a reciprocal reinforcing influence. This explanation is consistent with the apparent concurrent acceleration of rates of abstinence and employment in ICM after month 15. We intend to examine these possibilities in subsequent analyses.

Findings indicate that the usual care group actually had higher rates of employment than did the ICM group during the first year of follow-up, but the relationship reversed during year 2. In addition, post hoc analyses suggested that the strongest group differences were in rates of full-time employment. These findings are consistent with earlier ones indicating that ICM participants were significantly more likely than were usual care participants to be engaged in treatment during the first year of follow-up. Thus, it appears that a greater number of usual care participants sought work immediately. Employment gains for the ICM group that emerged in the second year of follow-up were likely related to ICM participants completing treatment and being available to work as well as having had significantly higher rates of abstinence than those in the usual-care group. The overall pattern of employment findings is consistent with underlying assumptions of those advocating the importance of substance use disorders treatment before employment training for welfare



**TABLE 1—Employment Outcomes During Months 22, 23, and 24 of Intensive Case Management (ICM) or Usual Care (UC) for Substance-Dependent Women and a Non-Substance-Dependent Comparison Group (CG) Receiving Temporary Assistance for Needy Families: Essex County, New Jersey, September 1999–May 2004**

	Month 22				Month 23				Month 24			
	CG	UC	ICM	ICM vs CU, OR (95% CI)	CG	UC	ICM	ICM vs CU, OR (95% CI)	CG	UC	ICM	ICM vs CU, OR (95% CI)
Any employment, %	47	31	32	1.07 (0.64, 1.79)	47	30	32	1.09 (0.65, 1.82)	50	27	30	1.24 (0.72, 2.13)
Days worked among employed, no.	20	18	19		20	16	19		19	14	19	
Employed full time, %	34	21	22	1.08 (0.61, 1.93)	35	16	23	1.72 (0.92, 3.21)	34	9	22	3.24 (1.52, 6.91)

Note. OR = odds ratio; CI = confidence interval.

recipients with substance use disorders.<sup>16</sup> Specifically, on average, treatment facilitates abstinence<sup>29</sup> and abstinence significantly increases the likelihood of later employment.

Estimations of the magnitude of employment effects for the ICM group depend on the specific measure and time frame under consideration. Judging conservatively, the magnitude of the effects is quite modest if we consider the primary employment indicator (days employed) and limit interpretation to the 2-year follow-up period. In a less restrictive interpretation, the acceleration of effects at the end of the follow-up period and substantially higher rate of abstinence among ICM participants suggest that the eventual magnitude of employment effects for the ICM group at later time points may be large.

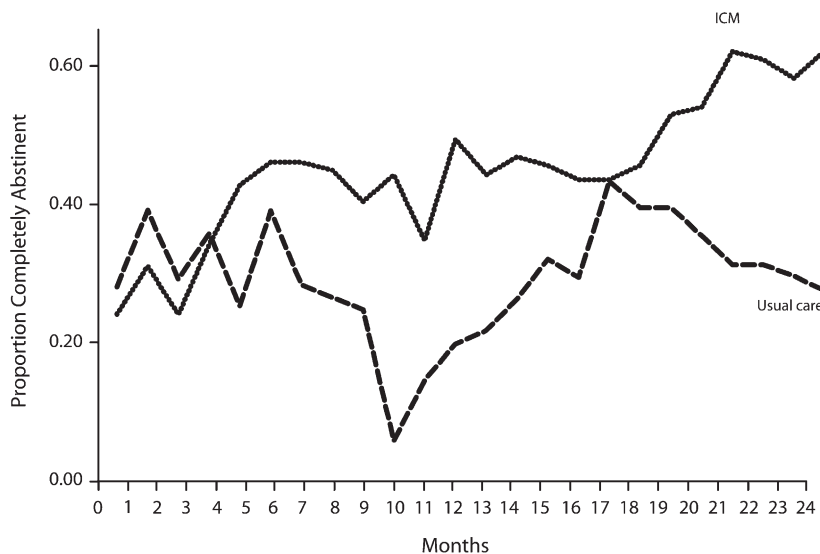
Unfortunately, data are not available on later employment outcomes. In addition, during the end of follow-up, absolute rates of employment in the ICM group were low. Fewer than 1 in 3 ICM respondents reported any work in the past month, and about 1 in 5 reported full-time employment. Placed in context, rates for the comparison sample were 50% reporting any work and 34% reporting full-time work.

**Generalizability**

To the best of our knowledge, only 1 previous study examined the effects of adding case management to substance use disorders treatment for those with substance use disorders, but that study found no effects on employment.<sup>30</sup> One previous report on the

CASAWORKS program found improved employment and substance use outcomes for drug-dependent women receiving TANF.<sup>31</sup> However, that evaluation used a single group pre-post intervention design. A number of studies have found that more substance use disorders treatment is related to better employment outcomes.<sup>32–34</sup> However, those studies used quasi-experimental designs and select cohorts, making interpretation of findings less certain.

A number of study limitations should be noted. We generally modeled exclusion criteria on the criteria that welfare agencies use to defer clients from work (e.g., psychosis). However, we excluded clients already enrolled in methadone or other substance use disorders treatment and those with less severe substance use disorders. Results should generalize well to the types of substance use disorders clients about whom TANF agencies are most concerned: those with significant substance use problems who screen positive for substance use disorders and are not engaged in treatment. Employment outcomes were based on self-report. Most welfare studies use administrative data to report on employment. Administrative records are likely to be more reliable but do not include “off the books” or “under the table” employment. In addition, the study employed a manual-guided, well-supervised ICM approach. It is not clear whether findings would generalize to less intensive or structured case management approaches. Finally, we did not report collateral information to corroborate self-reported substance use at month 24, but data from early points indicate that self-report was generally valid.



**FIGURE 3—Proportion completely abstinent from drugs each month among substance-dependent working women assigned to intensive case management (ICM) or usual care: Essex County, New Jersey, September 1999–May 2004.**

**Conclusions**

The primary implication of this study is that ICM is an effective intervention to improve employment outcomes for substance-dependent women receiving TANF. Before these findings,

virtually no rigorous data were available to guide welfare agencies on effective programs for women with substance use disorders who receive TANF. Generally, welfare agencies have been skeptical about whether clients with substance use disorders can become employed after more intensive interventions, because, in part, of research studies showing these clients face multiple, persistent employment barriers.<sup>7</sup> Very few welfare agencies routinely offer more-intensive interventions beyond a referral to treatment for clients with substance use disorders. Further research is needed to replicate these findings and explore ways to strengthen ICM to improve employment outcomes. ■

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### Contributors

J. Morgenstern was the principal investigator and contributed to the overall design and execution of the study and the preparation of the results. C. J. Neighbors and A. Kuerbis provided employment and welfare expertise as well as detailed data analysis, interpretation, and article preparation. A. Riordan was actively involved in the design and implementation of the study and the interpretation of findings from the state welfare office perspective. K. A. Blanchard contributed to study implementation, selection, and the design of measures; data collection; and supervision of the intervention, data analysis, and interpretation of results. K. H. McVeigh and T. J. Morgan oversaw all data collection activities, measure selection, quality assurance of data collection, and contribution to methodology on substance abuse findings. B. McCrady was the co-investigator of the study, collaborated with J. Morgenstern on the initial design of study and all aspects of project implementation for the Rutgers University group, and provided expertise on women and substance abuse critical to data interpretation.

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### Human Participant Protection

The Rutgers University and National Center on Addiction and Substance Abuse at the Columbia University institutional review boards approved this study.

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