*** PRELIMINARY & INCOMPLETE DRAFT – PLEASE DO NOT CITE***

Health and labor market consequences of eliminating public support programs among substance abusers

Pinka Chatterji, Ph.D.
Center for Multicultural Mental Health Research
Cambridge Health Alliance and NBER

Ellen Meara, Ph.D.
Department of Health Care Policy
Harvard Medical School and NBER

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Abstract

We use multiple years of data from the National Household Survey on Drug Abuse, and the National Survey of Drug Use and Health to assess how the 1997 termination of Supplemental Security Income benefits for Drug Abuse and Alcoholism affected labor market, health insurance, health utilization, and arrests among individuals likely to be affected by the legislation. Our findings suggest that terminating disability benefits against the backdrop of welfare reform did indeed increase economic self-sufficiency among substance users, in the short run (1997-1998). The policy shifts are positively associated with participation in the labor force, current employment, and negatively associated with receipt of SSI, though not with welfare use. The SSI policy changes did not accompany any significant change in rates of insurance, and we did not find significant effects on arrests. Interestingly, respondents were much less likely to report that they were unable to work due to disability in the two years following this policy change. We caution, however, that these policy changes took effect during a period of economic expansion, and our findings perhaps would be quite different during a period of greater economic uncertainty.

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1. Introduction

At the heart of the debate about the government's role in providing economic support to individuals with substance disorders are opposing views about the relationship between substance disorders and economic dependency. Some regard substance disorders as any other disabling illness; by this view, afflicted persons may require government support in order to meet their basic needs (Rosenheck, Frisman, & Gallup, 1995; Rossi, 1989; Sosin & Grossman, 1991). A recent paper documented striking similarities in the heritability and influence of environmental factors, the rate of adherence to recommended treatment, and relapse rates among those with drug dependence compared to patients with type II diabetes mellitus, hypertension, and asthma (McClellan et al. 2000). Others focus on the behavioral aspect of substance disorder, and imply that public programs may foster economic dependency and even encourage substance use by providing resources that can be used to purchase substances and by reducing incentives to work (Cohen, 1994; Phillips, Christenfeld, & Ryan, 1999; Shaner et al., 1995). Although recent studies do not support this latter claim (Rosen, McMahon, Lin, & Rosenheck, 2006; Swartz, Hsieh, & Baumohi, 2003), the idea already has affected public policy. Most dramatically, in March 1996, the US Congress passed legislation barring persons with disabling substance disorders from receiving Supplemental Security Income (SSI) and Disability Insurance (DI) benefits. Prior to this change, which took effect in January 1997, more than 200,000 individuals with substance disorders had been receiving SSI or DI (Gresenz, Watkins, & Podus, 1998).

Whether terminating public assistance benefits to individuals with substance disorders encourages economic independence, and whether loss of these benefits also

may cause harm, remains a key concern among policymakers. Surprisingly, this fundamental question has not been answered by research, despite the recent, major policy shift in federal disability programs that was targeted at individuals with substance disorders, and took place against the backdrop of a growing emphasis on personal responsibility and incentives in the US safety net system as a whole (Davies et al., 2000).

In particular, the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which replaced Aid to Families with Dependent Children (AFDC) with the Temporary Assistance to Needy Families (TANF) program, changed the landscape of income assistance to needy families in the United States, and may have had disproportionate effects on substance abusers. The TANF program instituted time limited benefits and work requirements for welfare recipients, and granted states broad discretion to sanction recipients when work or administrative requirements are not met (Blank 2000; Moffit 20xx). Some aspects of welfare reform targeted substance abusers explicitly. For example, although most states have not exercised this option, PRWORA authorized states to conduct drug testing of TANF recipients and to deny benefits to those who test positive (Pollack et al. 2002). The introduction of TANF, therefore, may have had special implications for poor women with substance problems, estimated to range from as little as 3% to as much as 37% of the welfare population (Metsch and Pollack 2005; Meara 2006).

The goal of this paper is to estimate the effects of terminating federal disability benefits for individuals with drug or alcohol problems on labor market, health, and criminal justice outcomes. The study uses pooled 1994-2002 cross-sectional data from the National Household Survey on Drug Abuse (NHSDA) and the National Survey on

Drug Use and Health (NSDUH). We use a difference-in-difference approach, specifying two alternative treatment groups consisting of low-education individuals with heavy substance use and/or symptoms of substance disorder, and a comparison group comprised of low-education individuals who do not have heavy use or any symptoms of substance disorder. Since welfare reform took place at the same time as the elimination of disability benefits for drug and alcohol disorders, for women, we interpret treatment effects as the combined effect of losing access to SSI and the introduction of TANF. In other words, for them, changes in outcomes reflect the loss of multiple sources of potential income benefits.

Our findings suggest that terminating disability benefits against the backdrop of welfare reform did indeed increase economic self-sufficiency among substance users, which was the intent of both policy changes, in the short run. The policy shifts are positively associated with participation in the labor force, current employment, and negatively associated with receipt of public assistance. The SSI policy changes did not accompany any significant change in rates of insurance. The only measured change in health utilization was an increase in inpatient hospital stays. Interestingly, respondents were much less likely to report that they were unable to work due to disability in the two years following this policy change. In the longer run, any measurable impact of the changes in SSI policy were washed away. We find no long run differential trend in employment, labor force participation, the likelihood of public program use, or health insurance status and utilization. Overall, our results show that individuals with substance problems experienced only short run changes in labor market outcomes after the loss of public support benefits during the mid 1990's. We caution, however, that these policy

changes took effect during a period of economic expansion, and our findings perhaps would be quite different during a period of greater economic uncertainty.

2. Changes in public support programs affecting individuals with substance problems

2.1 Elimination of the federal disability program for substance abusers

The SSI and DI programs are federal public assistance programs designed to provide financial resources to elderly, blind, and disabled persons (SSI) and income replacement in families where the primary wage earner is disabled (DI). Participation in the DI program for at least 24 months entitles beneficiaries to Medicare, and SSI recipients in most states automatically qualify for Medicaid (Gresenz et al., 1998). From the inception of the SSI/DI programs in the early 1970s, substance disorders were considered potentially disabling conditions. Initially, however, the number of beneficiaries in this impairment category was very small (Guydish, Ponath, Bostrom, Campbell, & Barron, 2003). During the late 1980s and early 1990s, the number of SSI recipients with substance disorders began to grow rapidly – between 1989 and 1994, the number of SSI recipients in the substance disorder disability category increased from 16,100 to 101,685 (Barber, 1996). In response, the federal government in 1994 imposed a three year time limit on receipt of disability benefits for those with disabling substance conditions (Guydish et al., 2003). In addition, substance abusers were required to be in treatment, which would be monitored and enforced by referral and monitoring agencies (RMAs).

Despite these changes in 1994, the number of SSI/DI recipients with substance abuse problems continued to rise during the 1990s, although as a group, substance

abusers still comprised less than 3 percent of the total SSI/DI adult population (Stapleton, Wittenburg, & Tucker, 1998). The federal government became increasingly concerned that recipients were not engaging in treatment and returning to work, which was the intent of the programs (Gresenz et al., 1998). Moreover, despite the requirement that SSI/DI payments to addicted persons be managed by individuals called representative payees, there was concern that disability payments were being used to purchase drugs. There was at that time and continues to be mixed empirical support for this claim (Catalano & McConnell, 1999; Frisman & Rosenheck, 1997; Rosen et al., 2006; Shaner et al., 1995; Swartz et al., 2003). Nevertheless, these perceptions culminated into a major policy change.

In March 1996, the US Congress passed legislation terminating eligibility for SSI/DI programs on the basis of disabling alcohol or other drug disorders; new and pending applications in cases where a substance disorder was a contributing factor to the disability determination would no longer be considered (Davies et al., 2000). The legislation also mandated that existing SSI/DI recipients with substance disorders would be terminated from the program as of January 1, 1997 (Davies et al., 2000).

Substance abusers with another disabling mental or physical condition were given the opportunity to be re-assessed for SSI/DI eligibility based on the other disability. If re-assessed successfully, these recipients regained their cash and health insurance benefits through the SSI/DI programs, but they no longer were mandated to be in treatment or to have their payments administered by a representative payee (Watkins & Podus, 2000). Of the 209,000 beneficiaries targeted by the January 1997 policy change, 80% were SSI beneficiaries and only 11% were DI beneficiaries who had never received SSI. By

December 1997, it is estimated that about 71,000 of the 209,000 targeted beneficiaries had re-gained SSI/DI eligibility and about 103,000 had lost eligibility as a direct result of the policy change (Stapleton et al., 1998). About 51,723 SSI-only recipients, or about 43% of the SSI-only recipients targeted by the policy change, were estimated to have lost eligibility as a direct consequence of the policy change by December 1997 (Stapleton et al., 1996). As individuals with little work history who do not qualify for the more generous DI benefits, we expect that individuals on SSI were those most vulnerable to potential adverse consequences of the program change. Thus, we focus on SSI recipients in this analysis. Figure 1, shows administrative estimates of the overall SSI caseload, those collecting benefits for Drug Abuse and Alcoholism, and for SSI recipients qualifying due to a mental health disorder (which would include addictive disorders) over the 1990s and after 2000. The drop off of SSI receipt from 1996 to 1997 is sudden, dramatic, and if the mental health caseload gives any indication, it may have been offset by later increases in the mental health caseload.

2.2 Effects of losing disability benefits on individual outcomes

Addicted persons who until 1997 had been receiving SSI/DI payments are an extremely disadvantaged group. The individuals targeted by the 1997 termination of SSI/DI benefits were mostly male (about 73 percent) and middle-aged (about 40 percent were between 40 and 49 years old) with high levels of psychiatric impairment, medical co-morbidities, limited work experience, and low levels of education (Davies, Iams, & Rupp, 2000; McKay, McLellan, Durell, Ruetsch, & Alterman, 1998; Stapleton et al., 1998). Targeted SSI beneficiaries had extensive criminal histories; one estimate suggests that about 84% of this population had been charged with any criminal offense, and almost

a third of males had a history of charges for a violent crime (Stapleton et al., 1998). As of 1995, about 53% of substance abusers receiving SSI benefits were classified as alcohol dependent, 18% were classified as drug dependent, and the remaining 29% had both alcohol and drug dependence (Barber, 1996). The average monthly SSI payment to disabled substance abusers was $425 in 1995, and 69% of substance abusers receiving SSI in 1995 had no other sources of income (Barber, 1996).

Given these characteristics, there has been concern that former SSI/DI recipients may have faced significant barriers in entering the labor market and finding jobs after the policy change took place. Moreover, losing SSI/DI cash benefits, as well as losing the oversight of treatment and access to Medicare and Medicaid, may have adversely affected these individuals' mental and physical wellbeing, utilization of health services, and criminal involvement. The few studies available on this topic, however, offer mixed support for this idea.

Watkins, Podus, Lombardi, & Burnam (2001), for example, follow 253 SSI beneficiaries in Los Angeles, interviewing them for the first time around the time the 1997 policy change went into effect and then again at 12 month, 18 month and 24 month follow-up interviews. Surprisingly, they find no evidence that the mental health status of respondents declined during this period, even though only 106 of the 253 respondents were still receiving SSI benefits at the 24 month follow-up interview. There also was no increase in emergency department visits and hospitalizations among respondents who lost SSI benefits (Watkins et al., 2001).

Guydish et al. (2003) report similar findings in a multi-site study of 1,670 individuals who at baseline were receiving SSI benefits for a disabling substance use

condition. Most baseline interviews were conducted between November 1996 and March 1997. Respondents were then interviewed and administered the Addiction Severity Index (ASI) every six months over a two year follow-up period. Over time, they find either no change or improvement in ASI score, and no apparent association between ASI score and SSI receipt status. Possibly, these studies do not follow respondents long enough to find effects, since in the short-term during the late 1990's (a period of economic expansion) disabled substance abusers may have been able to rely on state and county sources of public support, or the help of family and friends (Watkins et al., 2001).

Finally, a recent study based on data from Chicago indicates that termination of SSI benefits may have led to reduced access to Medicaid. Hanrahan et al., 2004, using longitudinal data on 11,740 individuals who had been receiving SSI benefits for a substance disorder in Chicago in 1995, show that by 1998, almost half of these individuals had lost their Medicaid coverage (Hanrahan et al., 2004).

2.3 The backdrop of welfare reform

Around the same time federal disability benefits were being eliminated for substance abusers, another major dismantling of the public safety net was taking place – the introduction of the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA). PRWORA ended the 60-year old entitlement program, Aid to Families with Dependent Children, replacing it with the transitional program, Temporary Assistance to Needy Families (TANF). Broadly, the law intended to reduce dependence on public programs and increase employment among the population eligible for public income assistance. Several notable provisions of PRWORA toward the goal of

self-sufficiency included 1) the introduction of time-limited benefits including a 5-year maximum lifetime limit; 2) the addition of work requirements in exchange for receiving benefits; and 3) provisions granting states broad discretion to employ sanctions such as the reduction or termination of benefits, including Medicaid benefits, when work or administrative requirements are not met.

In addition to time limits and work requirements, one other provision of PRWORA and two pieces of related legislation passed in 1996 are relevant to those with substance problems. First, PRWORA allows states to conduct drug testing of TANF recipients and to impose sanctions on those who test positive. About 12 states have adopted policies to allow drug testing, and although few exercise this option, the language in the legislation arguably impedes state efforts to screen TANF applicants and refer them for substance abuse treatment. Second, the Gramm amendment imposed a lifetime ban on eligibility for TANF assistance and food stamps for individuals who receive a drug felony conviction after August 22, 1996. States may opt out of the ban, or narrow its scope, and 59 percent were doing so in 2002.[9] Third, legislation governing public housing allowed the expulsion of individuals convicted of the possession or sale of illicit drugs.

There are several reasons why welfare reform and these related policy changes may have disproportionately affected low-income mothers with substance problems compared to other low-income mothers. First, evidence before and just after welfare reform supports the notion that women who report moderate to heavy use of drugs and/or alcohol had longer continuous welfare spells, thus pushing them towards welfare time limits sooner (Jayakody et al. 200xx; Meara and Frank 2006). Second, women who use

illicit drugs are much more likely to have a history of criminal involvement, making them vulnerable to restrictions for felons, and further decreasing their expected chances of obtaining employment. Finally, even in the absence of explicit changes in use of SSI among those disabled by addictive disorders, the change in policy towards individuals with addiction arguably would be expected to lead to a chilling effect, analogous to that documented among immigrants following the introduction and subsequent repeal of legislation banning immigrants from receiving federal income assistance (Borjas 20xx).

2.4 Contribution of our study

The key question of interest to policymakers is the following: has the elimination of federal disability payments, as well as the health insurance and monitoring of treatment and finances that the disability programs previously had provided, had long-term effects on labor market, health, and criminal behavior outcomes in the national population of individuals with disabling substance problems? The three prior studies in this area were based on data from geographically limited, narrowly defined populations and followed respondents for only about one to two years after the policy change took effect in 1997. Moreover, an important methodological limitation of prior studies is the lack of comparison groups; in these studies, outcomes are compared pre and post policy change in a group that was affected by the policy. None of the existing studies described above can provide evidence on potential spillover effects of policies terminating benefits to those with substance use disorders. These policies can affect not just those receiving benefits at the time of the legislation, but potential new applicants who were shut out of benefits, as well as those individuals diverted from the welfare caseload, who might otherwise have qualified for SSI benefits. Even among those who maintained benefits

because of co-occurring disorders, the new policy eliminated the requirement that individuals obtain treatment for their substance disorder, which might reduce the amount of treatment sought and obtained by those on SSI. SSI leaver studies cannot capture any of these effects.

The present study, on the other hand, is based on repeated, nationally representative cross-sectional samples of individuals from the 1994-2002 NHSDA/NSDUH. The use of the NHSDA/NSDUH allows us to examine for the first time the long-term, national effects of this important policy change. Also, a major advantage of our proposed study is our methodological approach includes utilization of a comparison group, which helps control for other, potentially confounding factors that may be related to the outcomes of interest.

3.0 Empirical Approach

A central challenge in estimating the effects of any public policy change on individual-level outcomes is determining whether or not an observed association represents a causal relationship. The current analysis shares this methodological hurdle. When analyzing the effects of the termination of disability benefits, or welfare reform on economic and health care outcomes, results may arise from a causal relationship or from unmeasured factors affecting both the outcome variable of interest at the same time as a major policy change. In this case, the association between the policy change and the outcome would not necessarily reflect a causal relationship.

In this study, we combine several methods to attempt to circumvent this problem. First, we use a difference-in-difference (DD) framework to identify the effect of the SSI policy change on individual-level outcomes. In this instance, we use pooled repeated

cross sections of data to analyze effects on the outcomes of interest for individuals likely to be affected by the policy change, and similar individuals unlikely to be influenced by the change (Acs & Nelson, 2004). We compare changes in employment, health and other outcomes before and after the policy change for two groups – a "treatment group" which includes individuals most likely to have been affected by the change in SSI eligibility because of their substance use and/or symptoms of substance dependence and a "comparison group" consisting of similar individuals who were relatively likely users of SSI before the policy change but unlikely to have been affected by the policy change.

The basic econometric specification, ignoring covariates for the moment, is a regression of an outcome variable (e.g., employment) on binary indicators representing presence in the treatment group, the period after the SSI/DI policy change, and the interaction of these two variables,

$$Y_{it} = \beta_0 + \beta_1 After_t + \beta_2 Treat_{it} + \beta_3 After_t * Treat_{it} + u_{it.} \quad (1)$$

In this set up, Y_{it} is an outcome variable for individual i in year t, "After" is the policy change indicator which is zero before the policy change occurs and one afterwards, "Treat" is a dummy variable indicating membership in the treatment group (comparison group is the baseline), "After*Treat" is an interaction between treatment and the post-policy change period, and u_{it} is an individual-specific idiosyncratic term. All measures are described in the next section. If Y_{it} is a continuous, normally distributed variable, then, the DD estimator β_3, is an unbiased estimate of the policy effect under the identifying assumption that no time-varying omitted variable is correlated with both the treatment group and the outcome of interest, Y.

The goal in this framework is to construct a comparison group that is as similar as possible to the treatment group, but would not have been affected by the policy change, i.e. would not have been eligible for DI or SSI because of disabling substance conditions under the pre-1996 rules. Data limitations rule out some good candidates for control groups (i.e. individuals with history of mental illness but no symptoms of substance use disorders). Thus, we use a two-step process exploiting our data to identify individuals who are relatively likely to use SSI and to balance observed characteristics between those in our treatment groups (individuals likely to have abuse or dependence) with other individuals. We build our sample in the following steps. First, we estimate logit models to predict the probability of SSI use during the period before the legislative change (1994 through 1996) as a function of demographic characteristics.

$$P(SSI_{it} = 1) = \frac{e^{X_{it}'\beta + T_{kt}'\gamma}}{1 + e^{X_{it}'\beta + T_{kt}'\gamma}} \qquad (2)$$

In this set-up, $\mathbf{X_{it}}$ is a vector of characteristics for individual i, described below, and $\mathbf{T_{kt}}$ is a vector of characteristics varying by year, t, and/or by demographic group, k, to control for secular trends that might also influence SSI, such as the unemployment rate, or rates of incarceration. Using the coefficients from these models, we generate the propensity to use SSI for the sample in all years of data. We keep only individuals with propensity scores in the top half of the distribution. Then, using the same framework as in (2) we take this sample of relatively likely SSI users and predict the probability of being in our treatment group (likely abuse or dependence), as a function of observed characteristics. We obtain propensity scores, or probabilities of being in the treatment group, and we weight each observation in our sample by the probability of being in the opposite group. That is, individuals in the treatment group receive a weight of (1 – the propensity score),

and individuals in the control group receive a weight equal to the propensity score. By constuction, this propensity score weighting technique, used previously in the health services literature, forces the distribution of characteristics in the propensity model to be identical across the two groups (McWilliams et al. 2003; Keating et al. 2006). When estimating models of the effect of changes in SSI, to implement propensity score weighting techniques we weight all estimation and summary statistics by the propensity score weight multiplied by the sample weight provided in the NHSDA/NSDUH surveys. This modified weight balances the distribution of observed characteristics during the pre-period among the treatment versus control groups.

In our model, the outcome variables are all dichotomous variables, and thus cannot be estimated in a simple OLS framework. We estimate each binary outcome using logit models like that in (3).

$$P(Y_{it}=1)=\frac{e^{\beta_1*Treat+\beta_2*After+\beta_3*Treat*After}}{1+e^{\beta_1*Treat+\beta_2*After+\beta_3*Treat*After}} \qquad (3)$$

Because of this nonlinear specification, one cannot interpret β_3 as the DD effect, as discussed in detail by (Ai and Norton 2003). Instead, we present results on the magnitude of the DD effect based on predicted probabilities obtained from the logit coefficients in the models, bootstrapping the standard errors on these predicted probabilities and the DD estimate with 500 replications (still to come). The logit model coefficients estimated here reflect Huber/White-adjusted standard errors to address

arbitrary heteroskedasticity and the correlation of observations within the primary sampling units, or counties, in the surveys used (White 1980; Bertrand et al., 2004).

The National Household Survey on Drug Abuse and the National Survey on Drug Use and Health

We use pooled, annual, cross-sectional 1994–2002 data from the National Survey on Drug Use and Health (NSDUH), known as the National Household Survey on Drug Abuse (NHSDA) through 2001. In the long term, we will contrast results in the 1999-2002 period to those in the 1997-1998 period. In what follows, all data presented reflect the period from 1994-1998, unless otherwise specified. The NHSDA/NSDUH is apt for this study because it is designed to produce substance use incidence and prevalence estimates for the general U.S. civilian, non-institutionalized population aged 12 and older, including residents of non-institutional group quarters such as group homes, shelters, and rooming houses. The survey includes questions from the Diagnostic and Statistical Manual (DSM) of Mental Disorders that allow diagnostic criteria to be applied to identify symptoms of dependence or abuse of alcohol and various illegal and prescription drugs. Respondents are also asked about substance abuse treatment history, personal and family income sources and amounts, employment, health care access and coverage, and criminal record. Completion rates are consistently close to 80 percent.

The sample design changed somewhat during the analysis period. The 1994–1998 surveys used a multistage area probability sample design involving five selection stages: 115 primary sampling units (e.g. metropolitan areas, counties, groups of counties, and independent cities) selected to represent the total U.S. population, blocks or block groups, housing units or group quarters, age-group-smoking classes within sampled

listing units, and eligible individuals within sampled age-group-smoking classes. Blacks, Hispanics and cigarette smokers were over-sampled, the latter to increase the precision of drug use estimates. Information was collected using personal interviews and self-enumerated answer sheets (for drug use questions).

Starting in 1999, eight large states contribute about 3,600 respondents each while remaining states yields about 900 respondents each. The sample is then stratified by field interviewer regions and areas consisting of adjacent census blocks, which form the primary sampling units within which dwelling units are selected by systematic sampling. Roughly equal numbers of people age 12-17, 18-25, and 26 and older are sampled. Computer-assisted personal interviews and audio computer-assisted self-interviews are used to collect information. Starting in 2002, each respondent who completed an interview was given $30.

Analysis Samples: As described above, implementation of the DD methods requites that the analytic sample is limited to NHSDA/NSDUH respondents who belong to either the treatment group or the comparison group. We consider two alternate treatment groups, both of which are limited to individuals who have relatively low levels of education and who show evidence of having a recent, disabling substance problem. Our primary treatment group – which we call the "broad" treatment group - includes individuals with 15 or fewer years of education who report: (1) heavy current use of alcohol and/or illicit drugs; (2) 3 or more symptoms of substance disorder for at least one single substance; and/or (3) receipt of any substance abuse treatment, including participation in a self-help group (e.g., Alcoholics Anonymous), in the past year. Heavy current use is defined as 3 or more alcohol binges (5+ drinks in one occasion) in the past 30 days; and/or 6 or more

occasions of marijuana use in the past 12 months; and/or 3 or more occasions of other illicit drug use in the past 12 months. The substance disorder symptoms included in the NHSDA/NSDUH surveys are based on DSM criteria and are applied to alcohol, illegal drugs (including marijuana, hallucinogens, inhalants, cocaine/crack and heroin) and non-prescribed use of prescription drugs (including pain killers, tranquilizers, stimulants and sedatives).[1]

The advantage of using the broad treatment group is that it is inclusive enough to capture many different forms and stages of substance problems (e.g., alcohol abuse), but it is still stringent enough to be limited to a individuals who are likely to have a recent disabling problem. Notably, this measure includes individuals with recent heavy use of substances, as well as those experiencing symptoms of disorder. Estimates generated from 2002 NSDUH data set indicate that the correlation coefficient between this heavy substance use measure and substance dependence is about 0.38 for women and about 0.41 for men.

A possible disadvantage of the broad treatment group, however, is that it may include some respondents who use substances heavily, but are not experiencing disabling

[1] Starting in 1999, the survey includes the following six criteria, pertaining to the previous 12 month period: 1) having a period of at least a month during which a great deal of time was spent getting the drug, using the drug, or getting over its effects; 2) building up a tolerance for the drug so that the same amount of the drug had less effect than before; 3) using the drug much more often or in larger amounts than intended; 4) use of the drug often preventing going to work or school, taking care of children, or engaging in recreational activities; 5) the drug causing emotional or psychological problems (such as feeling uninterested, depressed, suspicious or paranoid, or having strange ideas) or health problems (such as liver or stomach disease, pancreatitis, feet tingling, numbness, memory problems, an accidental overdose, a persistent cough, a seizure or fit, hepatitis, or abscesses); and 6) wanting or trying to stop or cut down use of the drug but being unable to do so. The survey items used to capture symptoms of substance disorder changed somewhat and generally became more extensive between 1994 and 2002. For example, between 1994 and 1995, some items capturing health problems and interference with daily activities were added and changed and in 1999, questions related to withdrawal symptoms were added for substances in which withdrawal symptoms can occur. We dealt with this issue by using the six symptoms listed above which are fairly consistent across all years.

problems associated with use. For this reason, we also consider an alternate, more stringently defined treatment group. Our "narrow" treatment group is limited to individuals with less than 15 years of education reporting: (1) 3 or more symptoms of substance disorder for at least one single substance; and/or (2) receipt of any substance abuse treatment, including self-help groups, in the past year. The narrow treatment group only includes respondents who appear to meet DSM criteria for substance dependence.

The comparison group for the study should be comprised of NHSDA/NSDUH respondents who are similar to those in the treatment group but should not have been affected by the SSI/DI policy change, which was specifically targeted at substance users. Thus, our comparison group includes respondents with less than 15 years of education who do not meet the criteria for current heavy substance use, do not have any symptoms of substance disorder, and do not report substance treatment in the past year.

We estimate models using separate samples for males and females and a combined gender sample. Together, including all surveys from the 1994B NHSDA through the 2002 NSDUH, 325,710 individuals, were sampled, including 210,452 individuals aged 18-64. After predicting propensity to use SSI and dropping the bottom half of the sample (based on SSI propensity), 77,709 had 15 years of education or less. Among this group, 8,570 had recent histories of heavy substance use, 3+ symptoms of dependence, or substance abuse treatment, and 49,506 had no symptoms of dependence, treatment, or heavy use, which formed our control group. Our narrow treatment group includes 8,570 individuals reporting 3 or more symptoms of dependence or SA treatment. When we limit the years to 1994 to 1998, to focus in on the time of the policy change, the

numbers in the broad treatment group, narrow treatment group, and comparison group are 6,854, 3,482 and 19,876, respectively.

Dependent Variables: We consider four types of outcomes as dependent variables: (1) receipt of public assistance; (2) labor market outcomes; (3) health insurance and health services utilization; and (4) criminal justice outcomes.

NHSDA/NSDUH respondents were asked whether they had received any SSI payments or assistance from welfare in the last calendar year. To ensure that respondents understood that they were being questioned about payments from SSI versus another public support program, the interviewer specified that "…federal SSI checks are either automatically deposited in the bank or mailed to arrive on the first of every month. If mailed, they are sent in a blue envelope." Similarly, the question regarding welfare participation specified that the respondent should not include SSI. From these questions, we create binary indicators of SSI receipt and welfare receipt. Note that the NHSDA/NSDUH question regarding receipt of federal disability benefits specifically mentions SSI, and does not include payments from the DI program.

We also create three binary variables indicating whether the respondent is currently in the labor force (employed or looking for work), currently is employed, and currently is disabled. From 1994-1998, the employment and labor force variables are based on questions about the respondent's "present work status." In 1999-2002, these variables are based on a question regarding work status in the past week.

To measure health insurance coverage, we create three variables that indicate whether the respondent is currently covered by: (1) any type of health insurance; (2)

Medicaid; and (3) any type of private insurance.[2] The interviewers specified that Medicaid is a public assistance program that pays for medical care, and also provided the name of the Medicaid program in the respondent's state. To measure utilization of health services, we create indicators of any visit to the emergency department in the past 12 months, and any inpatient hospital stay in the past 12 months. We also create two indicators specific to mental health services, given the likely high level of co-morbidity between mental and substance conditions in our sample. These indicators are the following: any psychiatric outpatient services in the past 12 months, and any psychiatric inpatient services in the past 12 months.

Finally, our measure of involvement with the criminal justice system is a binary indicator of whether or not the respondent reports being arrested and booked for any crime in the past 12 months. Data on arrests is only available starting in 1995; thus, models of arrests exclude 1994 survey data.

Main Independent Variable: Post policy-change. The key independent variable is the interaction between membership in the treatment group and a binary variable indicating that the federal government terminated SSI and DI benefits for individuals with disabling substance problems (After). This variable is determined only by time: it takes on a value of zero before the policy change (1993–1995 calendar years which correspond to the 1994-1996 survey years) and one thereafter (1996-2001 calendar years which correspond to the 1997-2002 survey years). We view the policy change as occurring in calendar year 1996, since it was in March of this year that the legislation was enacted and individuals

[2] The wording of the health insurance shifted slightly in the 1999 survey. In 1994 to 1998, respondents were asked whether they were covered by health insurance in the "current month." In later surveys, respondents were asked whether they had "current" health insurance.

could no longer apply for SSI benefits if they had a substance-related disability. We will examine whether findings are sensitive to this choice by also estimating models with the policy indicator based in calendar year 1997.

Other Independent Variables: In the propensity score model predicting SSI use, equation (2), and in the similarly specified model predicting presence in the treatment group, we control for the following individual characteristics (**X**): gender, race/ethnicity (Black non-Latino, Latino, and Other non-Latino race versus white non-Latino), age categories (22-23, 24-25, 26-29, 30-34, 35-49, 50-65 versus 18-21), marital status (widowed, divorced, never married versus married), education (< 12 years, or 12 to 15 versus 12 years), number of household inhabitants (dummies for 2 through 6+ versus living alone), population density category (MSA with more than 1 million, MSA with less than 1 million versus not in an MSA) and self-reported health status (poor, fair, good, very good versus excellent). We also include as controls a set of measures that, across time (**T**). These include the race/ethnicity-gender- specific national unemployment rate corresponding to the calendar year. We are in the process of collecting time varying data on arrest rates and/or incarceration rates during our study period to add as a control. In what follows, the logit models presented do not control for these covariates, which were included in the propensity score models.

4.0 Results

Table 1 presents the propensity score-weighted characteristics of the broad treatment group, (heavy substance users, individuals reporting substance abuse treatment

in the past 12 months, or those with 3 or more symptoms of substance dependence) compared to the control group in the pre- and post- periods. By design, all of the observed demographic characteristics included in the propensity score model are perfectly balanced during the pre-period. It is also notable that measures of public program use and labor market outcomes are relatively similar between treatment and controls during the pre-period. SSI use is 6.9 % in the treatment group compared with 5.1 in the control group. The percent employed is slightly lower in the treatment v. control group, 68.3 v. 72.1, but still similar. Reported rates of disability are also similar, 6.8 v. 6.3 percent. Health care utilization is similar across groups with the exception of psychiatric services, though substance abuse treatment would be an example of a psychiatric service, so the substance use in the treatment group could affect that. Arrest rates are considerably higher in the treatment group, 7.6 versus the controls, 1.1 percent. This isn't surprising given that the rate of arrests among the DA&A population was estimated to be quite high. However, results on arrests should be interpreted with caution given the differences across groups. Figure 2 fills complements these numbers by showing the yearly rate of employment, SSI receipt, and Welfare use of our treatment and control groups. The rates of employment and program use are relatively similar, and there is no clear divergence of trends in the first three years of the sample, though SSI use is notably higher among the individuals with 3 symptoms or more of substance dependence.

The rest of Table 1 reveals that respondents in our treatment and comparison groups are highly likely to be high school drop-outs (38.8 percent) never married (40

percent) and the plurality of respondents are aged 35-49 (37.0 percent) consistent with the demographics of recipients of SSI with DA&A as a qualifying disability.

Tables 2-4 and Figure 3 show the difference-in-difference estimates of labor market outcomes, after weighting by propensity scores to adjust for differences between treatment and control groups. As expected, SSI use drops disproportionately for heavy substance users and those with symptoms of substance dependence. The DD estimate of the drop is 2.9 percentage points among the broad treatment group, and 3.9 percentage points among the narrow treatment group. What is striking in the figure showing SSI use, is the flat or slight rise in SSI use among the control group, in contrast to the groups likely to have substance use disorders. Similarly, the change in employment for the control group is modest or flat, compared with a moderate to substantial rise in employment among the treatment groups. The estimated DD is largest among women in the 3 symptoms group, where estimates suggest that these women increased employment 7.9 percentage points more during the first two years following the elimination of SSI for substance abuse, compared to women in the control group.

Table 3 demonstrates that following the policy changes in 1996, individuals were significantly less likely to report not working due to disability, and they were much more likely to be in the labor force (either working or looking for work). Again, the pattern seems to be stronger, if anything, for individuals in the narrowly defined treatment group, or those with 3 or more symptoms of dependence (or recent substance abuse treatment). Figure 3 shows the contrast between women in the treatment group and the controls, among whom reported rates of disability were rising. Although multiple factors could create this pattern, it seems likely that individuals were influenced by the termination of

disability benefits and welfare reform, since these policies signaled a change in how substance use disorders were treated by public income programs.

Figure 3 and table 4 demonstrate a surprising finding; individuals with heavy substance use or symptoms of dependence were able to maintain non-disability related forms of assistance, welfare. This stands in contrast to the general exodus from welfare programs in 1997 and 1998 documented widely in the literature, and experienced by individuals in the control group. Individuals with symptoms of dependence were 2.9 percentage points more likely to maintain welfare, compared with individuals in the control group who exited welfare rapidly during this period. This finding is consistent with earlier work (Watkins et al. 2003) finding that former SSI recipients in Los Angeles were able to replace some of the lost income support through general assistance and other local programs. There were no similar trends for food stamp receipt.

One aspect of welfare reform and reforms to SSI/DI that has received much attention is the potential loss of health insurance benefits as individuals exit public programs for work. This could happen explicitly, as in the case of terminating SSI benefits and linked eligibility for Medicaid, or indirectly, as a result of exceeding income limits for Medicaid eligibility once employed, but with no alternative source of coverage through an employer or privately. Table 5 and Figure 4 show that in 1997 and 1998, at least, this fear did not materialize. The rate of health insurance didn't change disproportionately for individuals who were heavy substance users or those with symptoms of dependence. Medicaid coverage did not fall for this group, though in light of the welfare benefits maintained within our treatment groups, this is perhaps understandable.

Given the lack of influence on health insurance status or source of coverage, it is unclear whether one would expect large changes in health care utilization. The changes in employment, the drop in SSI use, and changes in individual perception of their conditions as less disabling, yield mixed findings on utilization. The percentage of individuals reporting a hospital stay rose disproportionately among heavy substance users, driven entirely by male substance users. The likelihood of reporting a hospital stay in the last year rose 5.1 percentage points more for heavy substance using men, compared to men in the comparison group. At the same time, women with 3 or more symptoms of dependence experienced a disproportionate drop in ER use, though this estimate is somewhat imprecise. On balance, this gives a mixed picture, suggesting little systematic change in utilization after termination of SSI benefits for substance abuse.

Finally, we present estimates of trends in arrest among our treatment and control groups in table 6 and figure 6. This analysis is perhaps the weakest due to lack of statistical power for this relatively uncommon outcome (especially given the absence of arrest data in 1994), and because the level of arrests differs so dramatically between treatment and control groups. The results are measured quite imprecisely, but suggest a disproportionate rise in arrests among males in both treatment groups. We are currently working to add lifetime arrest history to our propensity score analysis to improve the comparison between treatment and control groups, and perhaps our precision.

The results above suggest moderate effects of the termination of SSI benefits for substance abuse during this unusual era including an unprecedented long economic expansion and welfare reform. In other preliminary analyses (results not shown), it appears that the increase in employment, labor force participation, and the

disproportionate ability to maintain or replace SSI benefits with welfare benefits among individuals with heavy substance use or symptoms of dependence does not persist, since the addition of survey years 1999 through 2002 yields few if any significant results in analyses that are similar to those presented here.

Conclusions

The 1997 termination of federal disability benefits for individuals with disabling substance disorders was intended by policymakers to increase economic self-sufficiency among addicted persons by eliminating disincentives to work. There has been concern, however, that these benefits are the only legal means by which addicted persons can obtain income to satisfy their basic needs and access health and treatment services. Recent studies have failed to uncover changes in substance abusers' outcomes in response to the policy shift, but these studies analyze small, geographically constrained samples. In the present study, we examined trends in labor market outcomes, public assistance receipt, health care access and utilization, and illegal behaviors among substance dependent individuals using a much larger national sample over a period that begins three years before the policy change and extends until recently, allowing for the estimation of both short-run and longer term effects.

Our findings are consistent with earlier work showing few measurable negative consequences of the policy change. Although SSI use did fall disproportionately for the targeted groups, the shrinking welfare caseload happened more slowly for individuals with heavy substance use and or symptoms of dependence. Labor force participation and employment rose slightly faster for our treatment groups, but our estimates of these

effects were imprecise. Insurance status and source of coverage did not change. Consistent with this, the analyses of health care utilization yield few, if any, systematic effects related to the policy change. Overnight hospital stays appear to have increased slightly for men in the treatment group, but utilization of the emergency room, and both inpatient and outpatient psychiatric care, did not change. Arrest patterns did not change significantly for the treatment groups relative to comparison groups during the study period, though the qualitative results suggest that arrests for men in the treatment group may have risen. Surprisingly, a robust result of our analyses in each sample was that the percentage of individuals reporting that they were not at work in the last week due to disability declined. If one extends our sample until 2002, the results above do not persist (results not shown in this draft). Instead, these outcomes appear to move together for treatment and control groups over the long-run.

During the 1990s, the labor market reached unprecedented high levels of employment, especially among those with relatively few skills or little labor market experience. In such an era, a relatively short-lived employment response by individuals shut out of public disability benefits strongly counters arguments from academics and policy makers that the rise in the disability rolls, or the cyclicality of income support somehow reflects moral hazard (Autor and Duggan 2006). Instead, these programs have provided income support to individuals unable to maintain attachment to the labor force even in during a period of strong economic conditions. Fortunately, the expected disastrous consequences of increased crime, loss of health insurance, and heavier utilization of inpatient or emergency medical services either did not occur or occurred only in the short term. Of course, we were unable to assess other important indicators of

well-being, like income, changes in drug use, changes in the rate or severity of mental health disorders, or changes in eviction and/or homelessness, among this population. The results shown here suggest, on balance, that the individuals targeted by the termination of SSI/DI benefits for substance abuse, had few disasters. The short term responses, however, suggest an interesting set of new questions. In particular, with these data we do not know how individuals entered the labor market, and what services, if any, aided them in their search for employment. Additional information on the nature of jobs held by individuals during this unique period, and the circumstances under which individuals left, are crucial for understanding the complete ramifications of policy changes aiming to increase self-sufficiency entirely through incentives.

Questions regarding the employment histories of individuals with substance use disorders are increasing in importance as the recent reauthorization of Temporary Assistance to Needy Families has further limited states' ability to address the needs of welfare recipients with substance abuse issues. States are no longer at liberty to exempt women from work requirements while they obtain treatment for substance use or mental health disorders. Furthermore, the new regulations require more hours of work, and higher participation requirements. It is difficult to forecast the effects of these limitations, but they signal a new era under which vulnerable, low-skilled individuals with substance use disorders increasingly have fewer sources of support as they seek the very self-sufficiency that reforms of the mid-1990s aimed to achieve.

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Table 1: Summary Statistics

	Pre-period (1994-1996)		Post period (1997-1998)	
	Broad Treatment Group	**Controls**	**Broad Treatment Group**	**Controls**
Dependent Variables:				
Labor market & program participation				
SSI	0.069	0.051	0.046	0.058
Welfare	0.079	0.067	0.074	0.043
Food Stamps	0.194	0.163	0.168	0.129
Employed	0.683	0.721	0.728	0.731
In Labor Force	0.776	0.777	0.813	0.797
Disabled	0.068	0.063	0.058	0.083
Health Insurance				
Any health insurance	0.670	0.729	0.680	0.744
Private health insurance	0.515	0.580	0.533	0.612
Medicaid	0.132	0.122	0.125	0.105
Health care utilization				
ER visit	0.233	0.200	0.236	0.204
Inpatient stay	0.092	0.095	0.113	0.084
Inpatient psychiatric stay	0.013	0.005	0.021	0.006
Psychiatric outpatient services	0.086	0.055	0.089	0.064
Arrested in past year	0.076	0.011	0.095	0.014
Covariates:				
Sex				
Female	.392	.392	.358	.371
Age				
18-21	0.083	0.083	0.098	0.082
22-23	0.040	0.040	0.038	0.045
24-25	0.065	0.065	0.059	0.064
26-29	0.108	0.108	0.116	0.120
30-34	0.146	0.146	0.134	0.132
35-49	0.370	0.370	0.368	0.337
50-65	0.188	0.188	0.186	0.220
Education				
Less than 12 years	0.388	0.388	0.357	0.364
12-15 years	0.229	0.229	0.226	0.250
Marital Status				
Married	0.284	0.284	0.279	0.267
Widowed	0.026	0.026	0.026	0.035
Divorced	0.291	0.291	0.250	0.269
Never Married	0.400	0.400	0.445	0.428
Race				
White	0.638	0.638	0.629	0.609
Black	0.235	0.235	0.233	0.251
Latino	0.113	0.113	0.118	0.125
Other	0.013	0.013	0.020	0.015

Military Veteran	0.140	0.140	0.131	0.145
Health				
Poor	0.040	0.041	0.031	0.041
Fair	0.121	0.100	0.123	0.115
Good	0.312	0.251	0.293	0.255
Very Good	0.297	0.318	0.321	0.295
Excellent	0.229	0.289	0.232	0.293
Lifetime use of illicit drugs	0.556	0.556	0.614	0.589
Household Size				
1 inhabitant	0.153	0.153	0.184	0.177
2 inhabitants	0.298	0.298	0.236	0.301
3 inhabitants	0.246	0.246	0.276	0.246
4 inhabitants	0.133	0.133	0.137	0.126
5 inhabitants	0.092	0.092	0.070	0.080
6 or More inhabitants	0.078	0.078	0.097	0.067
Population Density [F]				
In MSA with pop>1 million	0.412	0.412	0.419	0.413
In MSA with pop<1 million	0.326	0.326	0.320	0.342
Does not live in MSA	0.262	0.262	0.262	0.245
N	4,077	12,378	2,777	10,962

NOTES:

[A] The sample is limited to respondents with less than 16 years of education & all percentages reflect both sampling and propensity score weights to match treatment and control group characteristics in pre-period.

[B] The broad treatment group includes respondents who report moderate to heavy substance use, 3 or more symptoms of disorder, and/or substance treatment (including self-help groups) in the last year. The "moderate to heavy use" criteria is met by any one of the following conditions: a) an individual "binges" (5 or more alcoholic beverages are consumed at one sitting) 3 or more times in one month; b) an individual uses marijuana 6 or more times in one year; or c) an individual uses any illicit drug other than marijuana 3 or more times in one year. The "3 or more symptoms" criteria is met when a person has at least 3 of 6 symptoms for at least one single substance, based on questions regarding 10 substances including alcohol.

[C] In the comparison group, individuals are excluded if they are in substance treatment, or meet any of the criteria for moderate/heavy use, or if they have any substance disorder symptoms.

[D] The employment measure is based on "present work status".

[E] The health insurance variables refer to current coverage at the time of the survey (or in the survey month).

Table 2: SSI and Employment

	SSI			Employed		
	Both Sexes	Men	Women	Both Sexes	Men	Women
A. Moderate/Heavy Substance Use, 3+ symptoms, and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment						
Treatment Group	0.326	0.288	0.388*	-0.179**	-0.277**	-0.065
	(0.212)	(0.317)	(0.217)	(0.086)	(0.129)	(0.105)
After (1997-1998)	0.131	-0.040	0.393***	0.019	0.023	-0.019
	(0.960)	(0.202)	(0.150)	(0.069)	(0.101)	(0.076)
Tx*After	-0.553**	-0.623	-0.487	0.169	0.328*	-0.028
	(0.273)	(0.393)	(0.343)	(0.127)	(0.187)	(0.172)
Difference-in-difference of predicted probabilities[B]	-0.029	-0.029	-0.027	0.035	0.050	0.005
B. Three or more symptoms and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment						
Treatment Group	0.654***	0.510	0.925***	-0.439***	-0.326**	-0.638***
	(0.249)	(0.363)	(0.293)	(0.111)	(0.161)	(0.147)
After (1997-98)	0.100	-0.051	0.389**	-0.034	-0.060	-0.311
	(0.167)	(0.234)	(0.180)	(0.083)	(0.116)	(0.092)
Tx*After	-0.555*	-0.623	-0.572	0.348**	0.344	0.416*
	(0.338)	(0.460)	(0.462)	(0.159)	(0.230)	(0.227)
Difference-in-difference of predicted probabilities[B]	-0.039	-0.037	-0.041	0.067	0.062	0.079

NOTES:

[A] Based on logit models using propensity score-weighted data to match characteristics in the pre-period. SEs shown in ( ) correct for correlation within sampling units. *=p-value<.10, **<.05, ***<.01

[B] Because the coefficients in the model are on a nonlinear scale, for ease of interpretation, we present the calculation of differences in predicted probabilities, or DD estimate, obtained based on coefficients from the logit models above: DD = (Post-Treatment rate– Pre-Treatment rate) – (Post-Control rate– Pre-Control rate).

[C] Panel A sample sizes: Full sample N = 25,841; Males n = 11,606; Females n = 14,235. Panel B sample sizes: Full sample N = 22,562; Males n = 9,718; Females n = 12,844

Table 3: Labor Market Characteristics

	Disabled			In Labor Force		
	Both Sexes	Men	Women	Both Sexes	Men	Women
A. Moderate/Heavy Substance Use, 3+ symptoms, and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment						
Treatment Group	0.078 (0.164)	-0.016 (0.209)	0.293 (0.226)	-0.0167 (0.102)	-0.150 (0.172)	0.124 (0.115)
After (1997-1998)	0.292 (0.131)	0.152 (0.870)	0.583*** (0.150)	0.064 (0.075)	0.032 (0.119)	0.061 (0.081)
Tx*After	-0.488** (0.233)	-0.449 (0.301)	-0.602* (0.332)	0.151 (0.146)	0.378 (0.233)	-0.084 (0.188)
Difference-in-difference of predicted probabilities[B]	-0.029	-0.029	-0.028	0.017	0.033	-0.013
B. Three or more symptoms and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment						
Treatment Group	0.254 (0.193)	-0.046 (0.248)	0.956*** (0.270)	-0.258* (0.136)	-0.156 (0.221)	-0.401*** (0.156)
After (1997-1998)	0.343** (0.160)	0.245 (0.200)	0.619*** (0.187)	-0.006 (-0.070)	-0.087 (0.138)	0.060 (0.099)
Tx*After	-0.655** (0.283)	-0.440 (0.368)	-1.14*** (0.401)	0.386** (0.181)	0.428 (0.284)	0.393 (0.248)
Difference-in-difference of predicted probabilities[B]	-0.045	-0.032	-0.068	0.046	0.043	0.054

NOTES:

[A] Based on logit models using propensity score-weighted data to match characteristics in the pre-period. SEs shown in ( ) correct for correlation within sampling units. *=p-value<.10, **<.05, ***<.01

[B] Because the coefficients in the model are on a nonlinear scale, for ease of interpretation, we present the calculation of differences in predicted probabilities, or DD estimate, obtained based on coefficients from the logit models above: DD = (Post-Treatment rate– Pre-Treatment rate) – (Post-Control rate– Pre-Control rate).

[C] Panel A sample sizes: Full sample N = 25,841; Males n = 11,606; Females n = 14,235. Panel B sample sizes: Full sample N = 22,562; Males n = 9,718; Females n = 12,844

Table 4: Welfare Outcomes

	Welfare			Food Stamps		
	Both Sexes	Men	Women	Both Sexes	Men	Women
A. Moderate/Heavy Substance Use, 3+ symptoms, and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment						
Treatment Group	0.155*	0.218	0.151	0.172	0.196	0.165
	(0.094)	(0.253)	(0.105)	(0.080)	(0.130)	(0.100)
After (1997-1998)	-0.503***	-0.627**	-0.447***	-0.276***	-0.303**	-0.227***
	(0.102)	(0.292)	(0.107)	(0.089)	(0.151)	(0.092)
Tx*After	0.434***	0.766*	0.374*	0.128	0.113	0.155
	(0.173)	(0.464)	(0.202)	(0.140)	(0.231)	(0.179)
Difference-in-difference of predicted probabilities[B]	0.019	0.011	0.039	0.007	0.002	0.024
B. Three or more symptoms and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment						
Treatment Group	0.250**	0.522*	0.192	0.258***	0.215	0.328***
	(0.128)	(0.307)	(0.146)	(0.099)	(0.147)	(0.135)
After (1997-1998)	-0.534***	-0.488	-0.516***	-0.264***	-0.227	-0.265***
	(0.119)	(0.333)	(0.121)	(0.105)	(0.176)	(0.104)
Tx*After	0.562**	0.808	0.421	0.259	0.262	0.223
	(0.234)	(0.549)	(0.280)	(0.182)	(0.276)	(0.242)
Difference-in-difference of predicted probabilities[B]	0.029	0.016	0.050	0.025	0.019	0.032

NOTES:

[A] Based on logit models using propensity score-weighted data to match characteristics in the pre-period. SEs shown in ( ) correct for correlation within sampling units. *=p-value<.10, **<.05, ***<.01

[B] Because the coefficients in the model are on a nonlinear scale, for ease of interpretation, we present the calculation of differences in predicted probabilities, or DD estimate, obtained based on coefficients from the logit models above: DD = (Post-Treatment rate– Pre-Treatment SSI rate) – (Post-Control rate– Pre-Control rate).

[C] Panel A sample sizes: Full sample N = 25,841; Males n = 11,606; Females n = 14,235. Panel B sample sizes: Full sample N = 22,562; Males n = 9,718; Females n = 12,844

Table 5: Health Insurance Outcomes

	Total Health insurance			Medicaid			Private Insurance		
	Both	Men	Women	Both	Men	Women	Both	Men	Women
A. Moderate/Heavy Substance Use, 3+ symptoms, and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment									
Treatment Group	-0.281***	-0.362***	-0.146	0.065	-0.052	0.143	-0.256***	-0.281***	-0.223**
	(0.072)	(0.092)	(0.121)	(0.088)	(0.187)	(0.106)	(0.073)	(0.100)	(0.109)
After (1997-1998)	0.092	0.088	0.106	-0.169*	-0.152	-0.144	0.136**	0.118	0.146*
	(0.072)	(0.095)	(0.088)	(0.091)	(0.167)	(0.094)	(0.071)	(0.094)	(0.081)
Tx*After	-0.058	0.036	-0.215	0.101	0.183	0.063	-0.048	0.033	-0.181
	(0.128)	(0.157)	(0.200)	(0.146)	(0.271)	(0.187)	(0.123)	(0.159)	(0.181)
Difference-in-difference of predicted probabilities[B]	-0.004	0.008	-0.021	0.011	0.016	0.016	-0.014	0.001	-0.042
B. Three or more symptoms and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment									
Treatment Group	-0.360***	-0.400***	-0.279*	0.233*	0.021	0.416***	-0.423***	-0.346***	-0.593***
	(0.093)	(0.117)	(0.158)	(0.122)	(0.190)	(0.160)	(0.101)	(0.130)	(0.153)
After (1997-1998)	0.083	0.104	0.047	-0.204*	-0.143	-0.213*	0.137*	0.114	0.158*
	(0.086)	(0.111)	(0.107)	(0.109)	(0.195)	(0.110)	(0.082)	(0.107)	(0.095)
Tx*After	0.025	-0.013	0.099	0.125	0.172	0.052	-0.002	-0.022	0.067
	(0.158)	(0.200)	(0.243)	(0.200)	(0.313)	(0.260)	(0.158)	(0.201)	(0.243)
Difference-in-difference of predicted probabilities[B]	0.021	0.013	0.036	0.011	0.013	0.004	-0.0002	-0.002	-0.002

NOTES:

[A] Based on logit models using propensity score-weighted data to match characteristics in the pre-period. SEs shown in ( ) correct for correlation within sampling units. *=p-value<.10, **<.05, ***<.01

[B] Because the coefficients in the model are on a nonlinear scale, for ease of interpretation, we present the calculation of differences in predicted probabilities, or DD estimate, obtained based on coefficients from the logit models above: DD = (Post-Treatment rate– Pre-Treatment SSI rate) – (Post-Control rate– Pre-Control rate).

[C] Panel A sample sizes: Full sample N = 25,841; Males n = 11,606; Females n = 14,235. Panel B sample sizes: Full sample N = 22,562; Males n = 9,718; Females n = 12,844

Table 6: Health Care Utilization

	Hospital Stay			ER visit			Psych Hospital Stay			Psych outpatient visit		
	Both	Men	Women	Both	Men	Women	Both	Men	Women	Both	Men	Women
A. Moderate/Heavy Substance Use, 3+ symptoms, and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment												
Treatment Group	-0.014	-0.140	0.129	0.211***	0.197	0.129	1.02***	0.910*	1.11***	0.521***	0.474**	0.568***
	(0.134)	(0.226)	(0.153)	(0.088)	(0.122)	(0.153)	(0.312)	(0.487)	(0.403)	(0.135)	(0.201)	(0.172)
After (1997-1998)	-0.124	-0.480***	0.252**	0.016	-0.071	0.252**	0.225	0.048	0.407	0.186	0.473**	-0.142
	(0.098)	(0.166)	(0.104)	(0.071)	(0.105)	(0.104)	(0.409)	(0.734)	(0.457)	(0.132)	(0.199)	(0.155)
Tx*After	0.361*	0.762**	-0.036	-0.037	-0.090	-0.036	0.239	0.511	-0.003	-0.092	-0.077	-0.086
	(0.199)	(0.321)	(0.250)	(0.130)	(0.180)	(0.250)	(0.505)	(0.891)	(0.570)	(0.232)	(-0.240)	(0.299)
Difference-in-difference of predicted probabilities[B]												
DD	0.033	0.053	-0.006	-0.001	-0.012	-0.022	0.007	0.008	0.006	-0.006	0.006	-0.024
B. Three or more symptoms and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment												
Treatment Group	0.298	0.168	0.483**	0.434***	0.355**	0.571***	1.55***	1.45***	1.67***	0.873***	0.857***	1.67***
	(0.187)	(0.288)	(0.231)	(0.110)	(0.148)	(0.152)	(0.369)	(0.534)	(0.484)	(0.158)	(0.228)	(0.484)
After (1997-1998)	-0.171	-0.520***	0.276**	0.008	-0.055	0.136	0.368	0.236	0.557	0.167	0.436**	0.557
	(0.124)	(0.201)	(0.126)	(0.086)	(0.122)	(0.103)	(0.740)	(0.844)	(0.496)	(0.156)	(0.226)	(0.496)
Tx*After	0.268	0.618	-0.177	-0.206	-0.095	-0.415*	-0.088	0.213	-0.497	-0.233	-0.199	-0.497
	(0.256)	(0.392)	(0.330)	(0.168)	(0.220)	(0.241)	(0.605)	(0.994)	(0.607)	(0.282)	(0.380)	(0.607)
Difference-in-difference of predicted probabilities[B]												
DD	0.021	0.037	-0.011	-0.041	-0.022	-0.081	0.005	0.009	-0.002	-0.025	-0.002	-0.070

NOTES: [A] Based on logit models using propensity score-weighted data to match characteristics in the pre-period. SEs shown in ( ) correct for correlation within sampling units. *=p-value<.10, **<.05, ***<.01

[B] Because the coefficients in the model are on a nonlinear scale, for ease of interpretation, we present the calculation of differences in predicted probabilities, or DD estimate, obtained based on coefficients from the logit models above: DD = (Post-Treatment rate– Pre-Treatment SSI rate) – (Post-Control rate– Pre-Control rate).

[C] Panel A sample sizes: Full sample N = 25,841; Males n = 11,606; Females n = 14,235. Panel B sample sizes: Full sample N = 22,562; Males n = 9,718; Females n = 12,844

Table 7: Arrest by gender

	Arrested		
	Both	Men	Women
A. Moderate/Heavy Substance Use, 3+ symptoms, and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment			
Treatment Group	2.06***	2.10***	1.97***
	(0.182)	(0.207)	(0.290)
After (1997-1998)	0.314	0.276	0.395
	(0.222)	(0.273)	(0.326)
Tx*After	-0.108	-0.028	-0.417
	(0.290)	(0.341)	(0.453)
Difference-in-difference of predicted probabilities[B]	0.016	0.025	-0.004
B. Three or more symptoms and/or SA treatment v. those with no moderate/heavy use, symptoms or treatment			
Treatment Group	2.60***	2.65***	2.53***
	(0.209)	(0.234)	(0.354)
After (1997-1998)	0.543**	0.526*	0.576
	(0.253)	(0.305)	(0.374)
Tx*After	-0.364	-0.262	-0.760
	(0.334)	(0.385)	(0.536)
Difference-in-difference of predicted probabilities[B]	0.018	0.038	-0.024

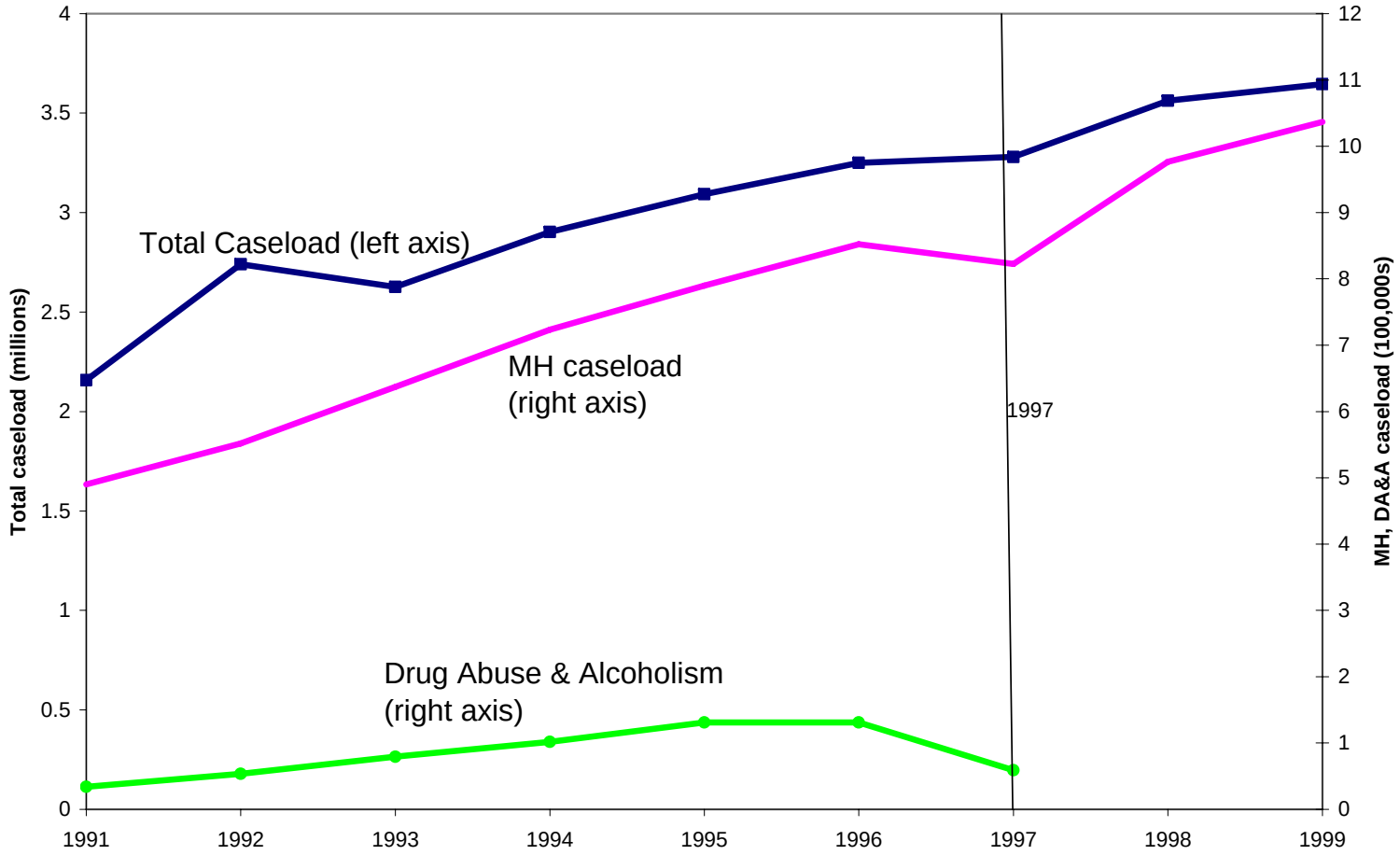
NOTES:

[A] Based on logit models using propensity score-weighted data to match characteristics in the pre-period. No arrest data are available in 1994b survey. SEs shown in ( ) correct for correlation within sampling units. *=p-value<.10, **<.05, ***<.01

[B] Because the coefficients in the model are on a nonlinear scale, for ease of interpretation, we present the calculation of differences in predicted probabilities, or DD estimate, obtained based on coefficients from the logit models above: DD = (Post-Treatment rate– Pre-Treatment SSI rate) – (Post-Control rate– Pre-Control rate).

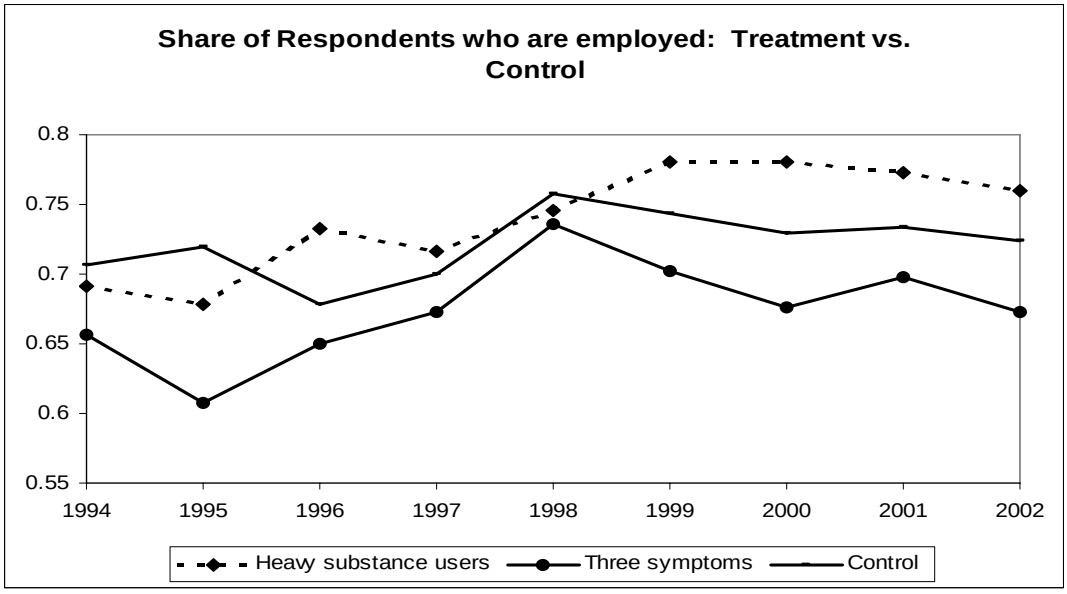
[C] Panel A sample sizes: Full sample N = 22,003; Males n = 9,421; Females n = 11,581. Panel B sample sizes: Full sample N = 18,646; Males n = 8,025; Females n = 10,621

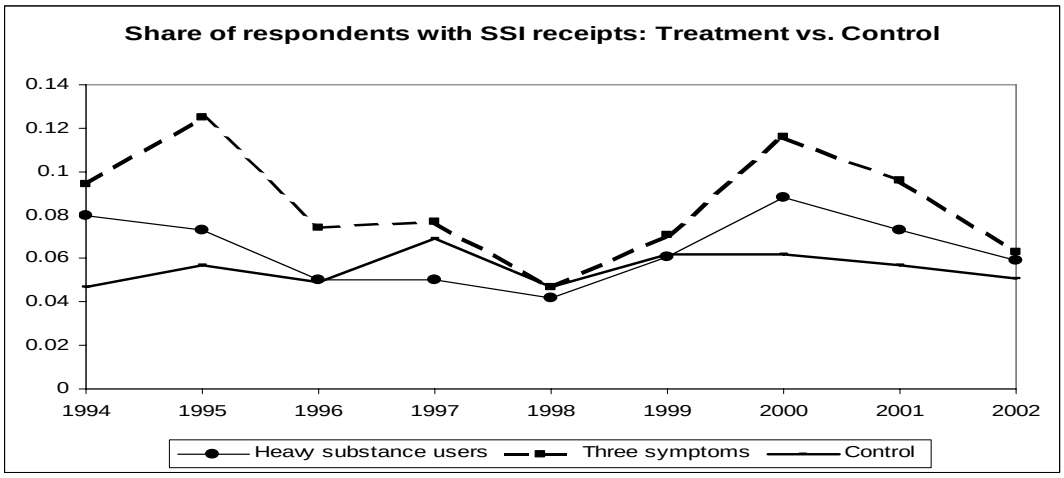
Figure 1: Trends in SSI caseload



Sources for Figure 1: for Total and Mental Health Caseload: Social Security Administration, Social Security Bulletin, Annual Statistical Supplement, 1991-2004 (Washington: Government Printing Office, 1991-2004). For DA&A population: Barber, S.L. Supplemental Security Income for whom Alcoholism and Drug Addiction Provisions Apply (DA&A Recipients). (Washington: Office of Program Benefits Policy, 1996) and for 1996, 1997 DA&A figures :Schmidt, Lucie. 2004. *Effects of Welfare Reform on the Supplemental Security Income (SSI) Program*, Policy Brief #4, National Poverty Center (available at http://www.npc.umich.edu/publications/policy_briefs/brief4/brief4.pdf).

Figure 2: Labor Market Trends By Year





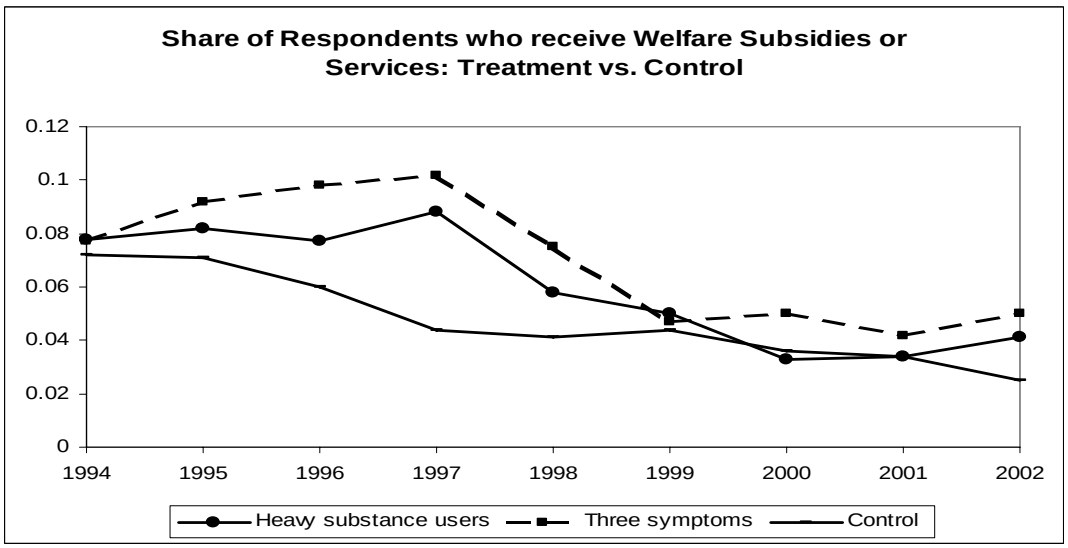
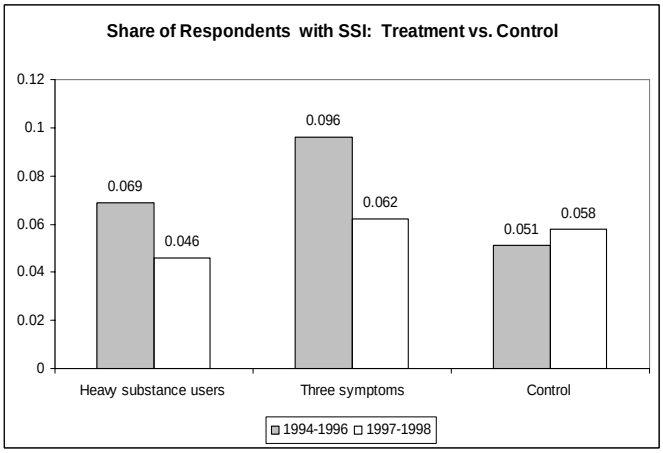
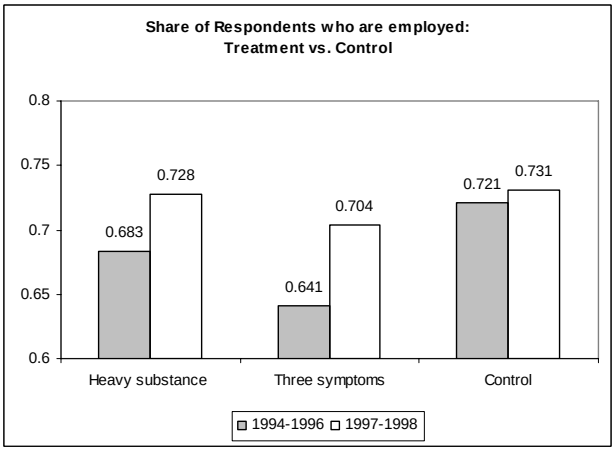
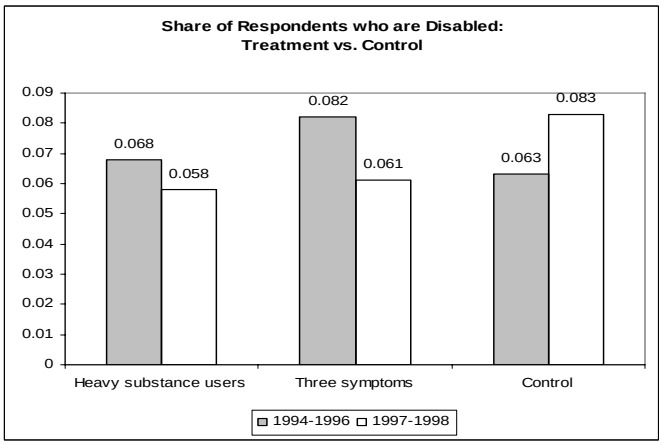
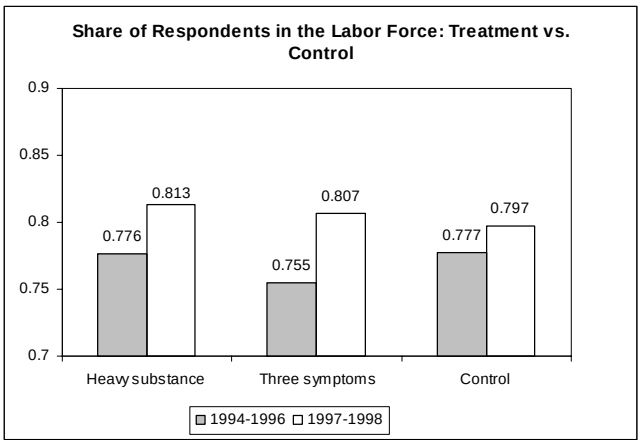


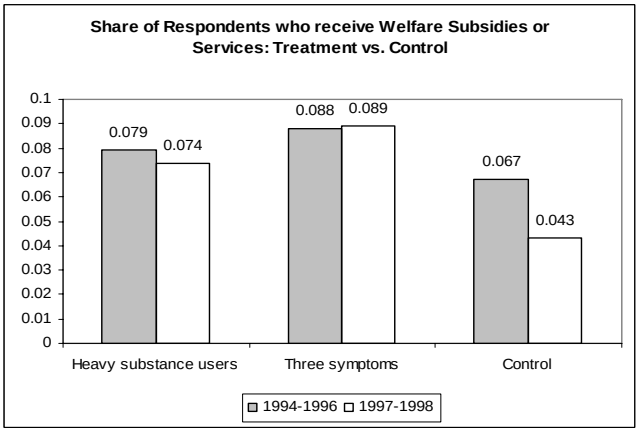
Figure 3: Labor Market Outcomes & Program Participation, Adjusted











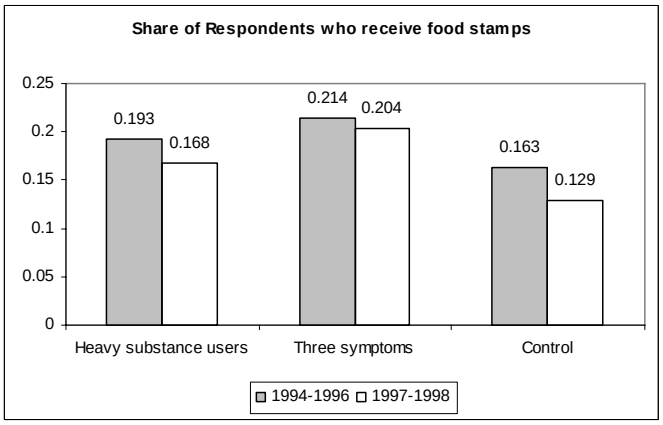
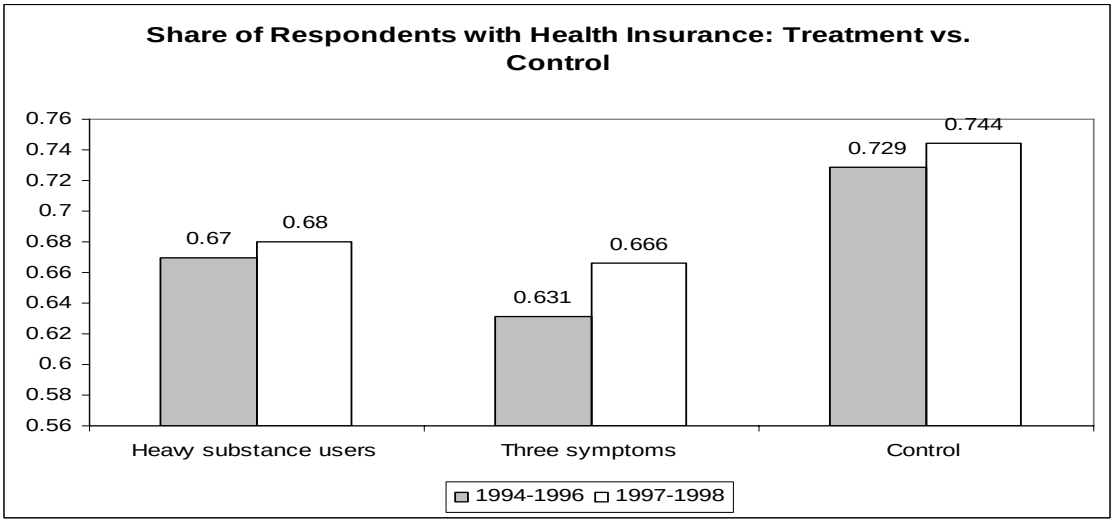
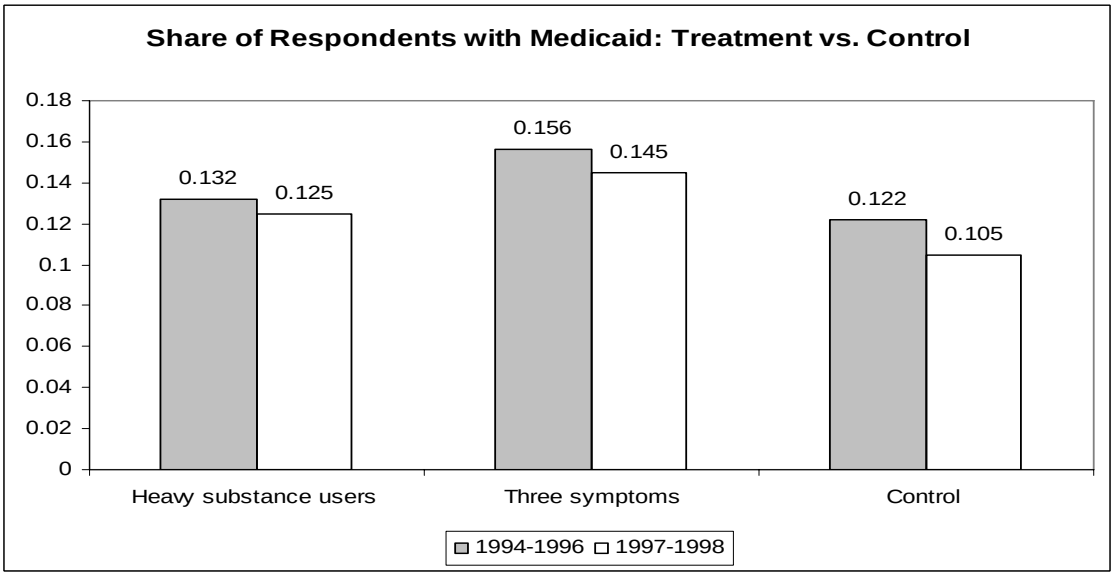


Figure 4: Health Insurance Outcomes, Adjusted





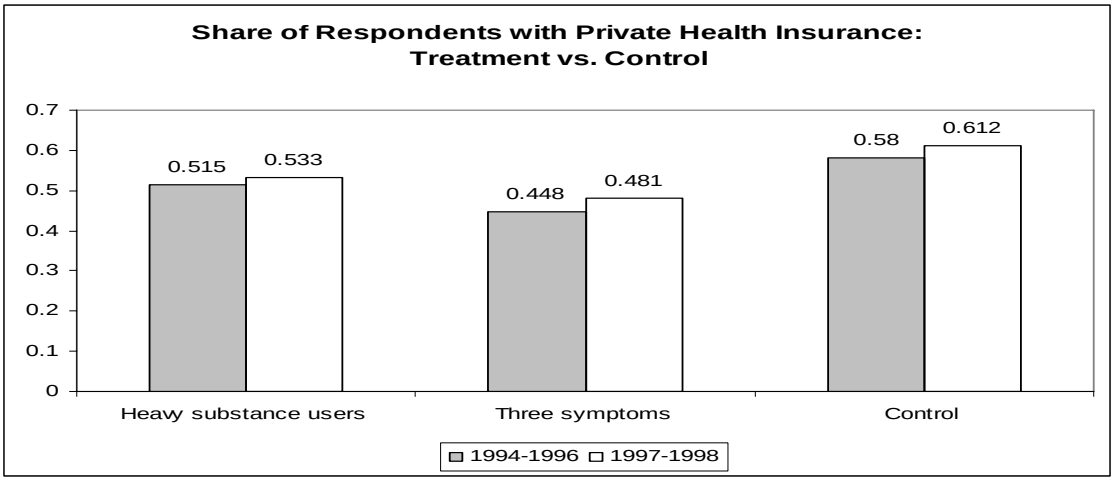
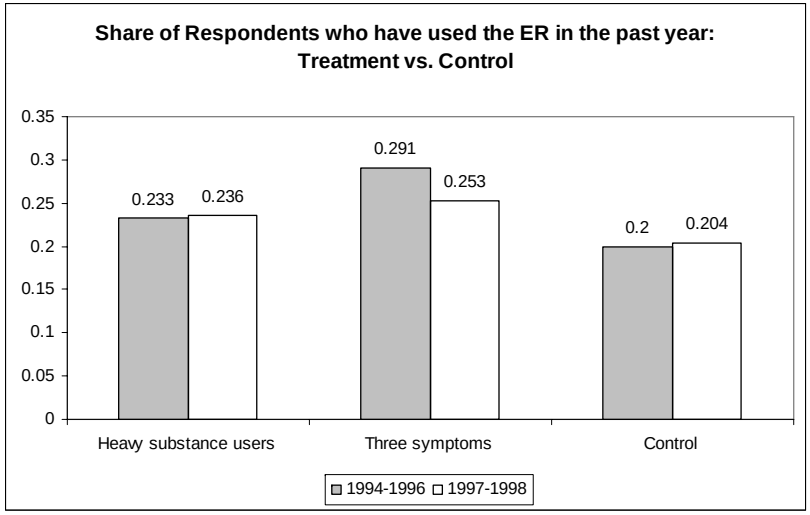
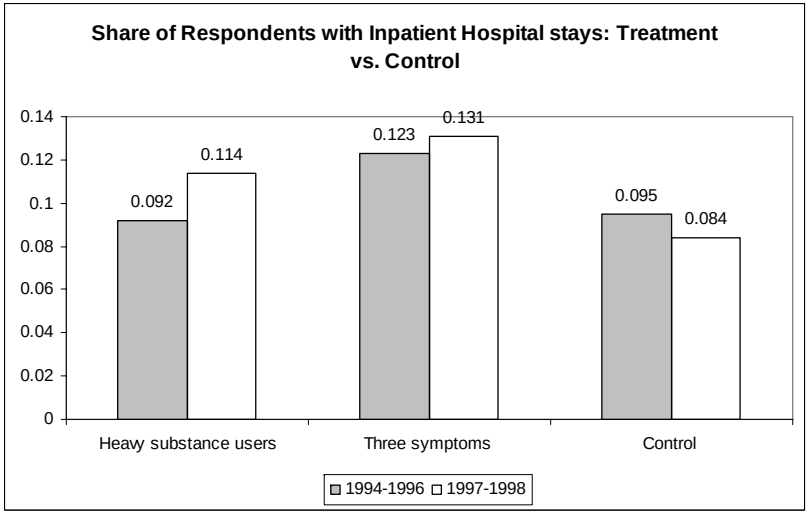
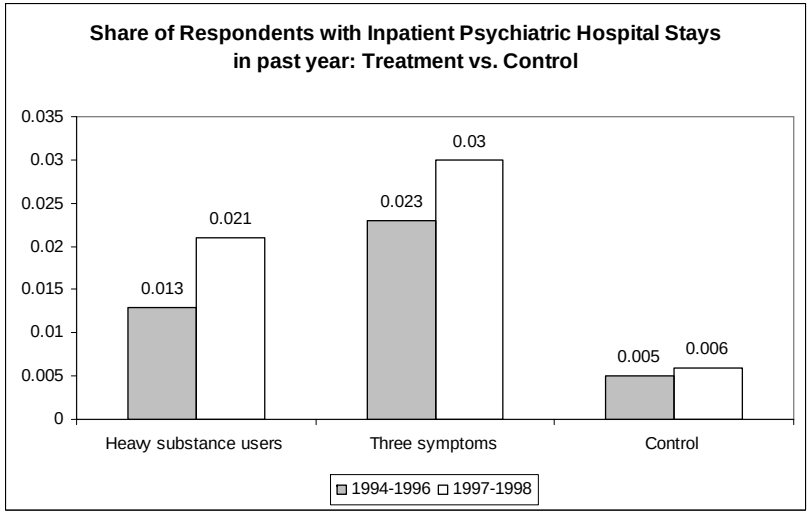


Figure 5: Health Care Utilization, Adjusted







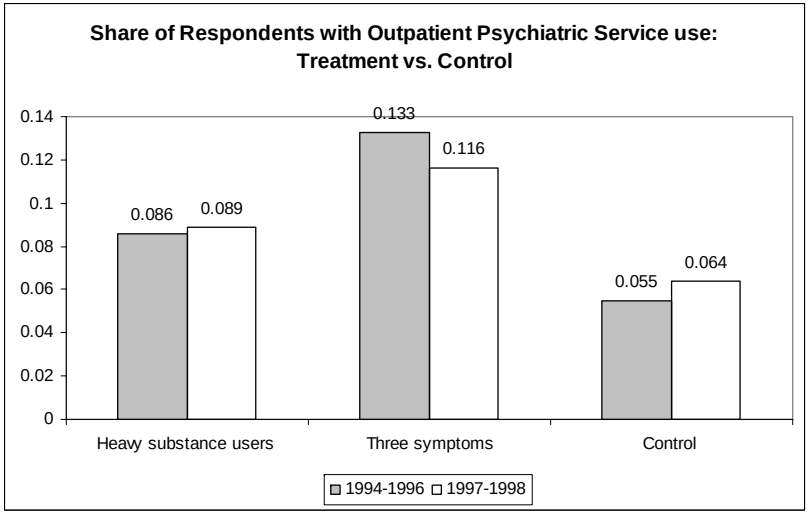
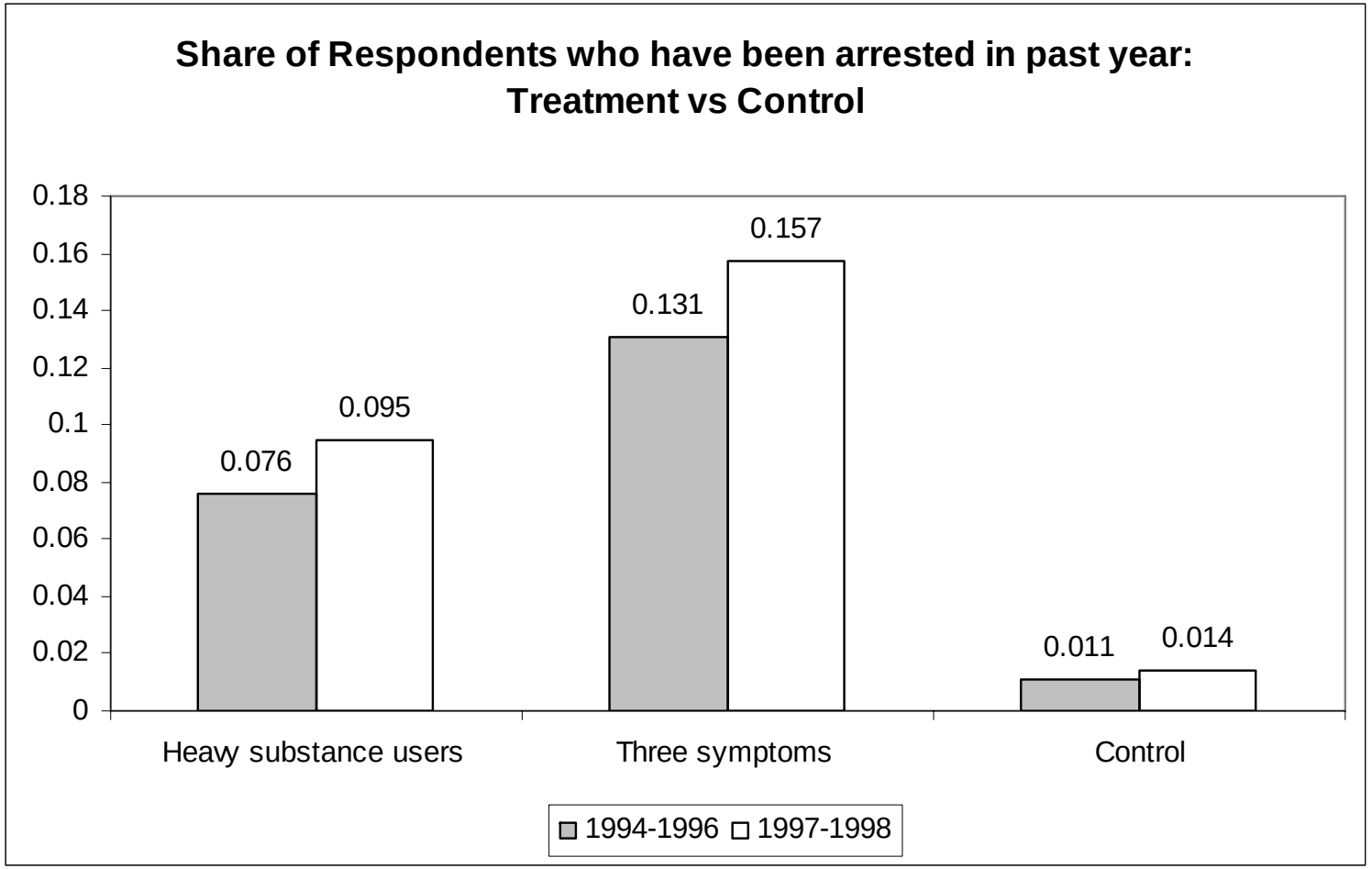


Figure 6: Crime, Adjusted



Source for Figures 3-6: Calculations based on Substance Abuse and Mental Health Services Administration (SAMHSA). *National Household Survey on Drug Abuse*. Rockville, MD: U.S. Department of Health and Human Services for year 1994-1998.