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California Drug and Alcohol Treatment Assessment (CALDATA), 1991-1993

Methodology Report

California Department of Alcohol and Drug Programs

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Data Collection Description

Principal Investigator(s): California Department of Alcohol and Drug Programs

Title: California Drug and Alcohol Treatment Assessment (CALDATA), 1991-1993

ICPSR Study Number: 2295

Funding Agency: California Department of Alcohol and Drug Programs

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Summary: The California Drug and Alcohol Treatment Assessment (CALDATA) was designed to study the costs, benefits, and effectiveness of the state's alcohol and drug treatment infrastructure (recovery services) and specifically to assess (1) the effects of treatment on participant behavior, (2) the costs of treatment, and (3) the economic value of treatment to society. Data were collected on participants (clients) across four types of treatment programs, or modalities: residential, residential "social model," nonmethadone outpatient, and outpatient methadone (detoxification and maintenance). Data were collected in two phases. In Phase 1, treatment records were abstracted for clients who received treatment or were discharged between October 1, 1991, and September 30, 1992. In Phase 2, these clients were located and recruited for a follow-up interview. The CALDATA design and procedures included elements from several national treatment outcome studies including the DRUG SERVICES RESEARCH SURVEY (ICPSR 3393), SERVICES RESEARCH OUTCOMES STUDY (ICPSR 2691), NATIONAL TREATMENT IMPROVEMENT EVALUATION STUDY (ICPSR 2884), and DRUG ABUSE TREATMENT OUTCOME STUDY (ICPSR 2258). The record abstract was designed to collect identifying and locating information for interview reference during the personal interviewing phase. The abstract also collected demographic, drug, or alcohol use, and treatment and service information. The follow-up questionnaire covered time periods before, during, and after treatment and focused on topics such as ethnic and educational background, drug and alcohol use, mental and physical health, HIV and AIDS status, drug testing, illegal activities and criminal status, living arrangements and family issues, employment and income, and treatment for drug, alcohol, and mental health problems. Drugs included alcohol, barbiturates, benzodiazepines, cocaine powder, crack, downers, hallucinogens, heroin, illegal methadone, inhalants, LSD, marijuana/hashish/THC, methamphetamines and other stimulants, narcotics, over-the-counter drugs, PCP, ritalin or preludin, and sedatives/hypnotics. CALDATA was originally known as the California Outcomes Study (COS).

Universe: All clients receiving recovery services in the four treatment modalities included in the study from California-based treatment providers known to the California Alcohol and Drug Data System (CADDS) as of September 1992. The CADDS programs include all providers who (1)

received any type of public funding for treatment or recovery services, (including grants, contracts, and MediCal reimbursements) during the current or previous fiscal years, and (2) are required to report to CADDS as a condition of state licensing.

Sample: CALDATA employed a multistage stratified sample design consisting of three stages. In the first stage, the state was stratified geographically into four regions to ensure state-wide coverage. Counties within these strata were randomly selected, with large counties being selected with certainty and small counties being clustered to provide sufficiently large sampling units. Selection chances for the non-certainty counties were weighted based on the number of participants. In the second stage of sampling, treatment providers were selected using similar principles of geographically balanced, size weighted random selection. In order to analyze each treatment modality, approximately equal numbers of facilities were selected across the modalities. As with counties, the smallest providers were clustered to provide adequately sized sampling units. In the third stage, client records were randomly chosen at each sampled facility with the number varying by the size of the provider and the extent to which the on-site listing of clients matched the number expected for that provider. Approximately 3,000 clients were selected for abstraction. Of these, 1,859 were recruited for the follow-up interview.

Date of Collection: September 1992-December 1993

Response Rates: The overall CALDATA participant response rates are approximately 50 percent for the discharge sample and approximately 46 percent for the continuing methadone maintenance (CMM) sample. Response rates by modality in cooperating providers range from 56-61 percent, with the exception of methadone maintenance (76.5 percent).

Data Collection Notes: (1) The study was conducted by the National Opinion Research Center at the University of Chicago and Lewin-VHI, Inc., Fairfax, Virginia, and Corte Madera, California. (2) The original data collection also included data on the treatment facilities. However, these data are not being released, per the data producers. (3) While 1,859 clients participated in the follow-up interview, 33 interviews were completed too late to be included in the study's final report. These cases are also excluded from the public use dataset, yielding a total of 1,826 cases. (4) The codebook, methodology report, and data collection instruments are provided by ICPSR as Portable Document Format (PDF) files. The PDF file format was developed by Adobe Systems Incorporated and can be accessed using PDF reader software, such as the Adobe Acrobat Reader. Information on how to obtain a copy of the Acrobat Reader is provided on the ICPSR and SAMHDA Web sites.

Data Source: personal interviews and record abstractions

Restrictions: Users are reminded that these data are to be used solely for statistical analysis and reporting of aggregated information and not for the investigation of specific individuals or organizations.

Extent of Collection: 1 data file + machine-readable documentation (PDF) + SAS data definition statements + SPSS data definition statements + data collection instruments (PDF)

Extent of Processing: CONCHK.PR/ CONCHK.ICPSR/ DDEF.ICPSR/ FREQ.ICPSR/ MDATA.PR/ SCAN/ REFORM.DOC/ REFORM.DATA/ UNDOCCHK.PR/ UNDOCCHK.ICPSR/ RECODE

Data Format: Logical Record Length with SAS and SPSS data definition statements

File Specifications

Part No.	*Part Name*	*File Structure*	*Case Count*	*Variable Count*	*LRECL*	*Records Per Case*
1	Data file	rectangular	1,826	1,205	2,551	1

Evaluating Recovery Services: The California Drug and Alcohol Treatment Assessment (CALDATA)

Methodology Report

Submitted to the

State of California
Department of Alcohol and Drug Programs

by

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at the University of Chicago
and
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A variety of agencies in the State of California aided the project at various points. We appreciate the assistance of Ken Reed and Chris Terwilliger at the Department of Motor Vehicles, Frank Martucci and Al Brinsfield at MediCal, Robert Dickover and R.H. Denninger at the Department of Corrections, and Charles Chen in the Department of Vital Statistics. At the federal level, Harriet Lebowitz at the Federal Bureau of Prisons, Office of Research and Evaluation, facilitated our obtaining access to federal inmates. Judy Perlman at Rand, and Birgit Danila and M. Douglas Anglin at the UCLA Drug Abuse Research Center were valuable consultants.

This study was fortunate to receive clear guidance, critical information, and all the good judgment and support one could ask for from Susan Nisenbaum, our ADP project coordinator; her colleague Dorothy Torres; and Richard Frantz, deputy director for administration. The energy, commitment to research, and sustaining vision of Andrew Mecca, director of ADP, were indispensable in commissioning this work and enabling its fruition.

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Summary from the General Report

Purpose

The California Department of Alcohol and Drug Programs (ADP), under the direction of Andrew Mecca, undertook an initiative in 1992 to promote better informed policy decisions at the state and local level by increasing the availability and reliability of data on the epidemiology of substance abuse and the outcomes of substance abuse treatment (recovery services). The California Drug and Alcohol Treatment Assessment (CALDATA) was the first fruit of this initiative. CALDATA was a pioneering large-scale study of the effectiveness, benefits, and costs of alcohol and drug treatment in California, using state data bases, provider records, and followup interviews with participants in treatment. CALDATA was designed as a voluntary survey to provide data that are representative of alcohol and drug recovery services in California and assess the costs and benefits of services available to publicly supported participants. CALDATA was the first followup-interview study to sample randomly from the population of alcohol and drug treatment providers in a state (or the nation), versus handpicking the research sites.

National Opinion Research Center at the University of Chicago (NORC) contracted with ADP to develop the technical design, to perform the data collection, and to analyze the data in association with Lewin-VHI, Inc., a health policy consulting and analysis firm in Fairfax, Virginia. Dean R. Gerstein, NORC's research vice-president for alcohol and drug studies, served as Principal Investigator. Natalie Suter and Kay Malloy served as Project Director and Project Field Manager, respectively; Robert Johnson was sampling statistician and lead survey analyst; and Henrick Harwood and Douglas Fountain of Lewin-VHI were responsible for carrying out the cost-benefit analysis. The study was begun in September 1992 and concluded in June 1994.

Methods

CALDATA gathered information data in two phases. The first phase involved systematic sampling of counties, providers, and participants in four types of treatment programs in California: residential programs, residential "social model" programs in particular, outpatient programs in general, and outpatient methadone. Participants were selected at random from discharge (or in-treatment) lists developed on site at cooperating providers. Sixteen counties, 97 providers, and approximately 3000 participants who received treatment or were discharged between October 1, 1991, and September 30, 1992 were selected into the study sample, which represented nearly 150,000 participants in treatment. The number of programs involved in CALDATA was larger than any prior treatment followup study; but more significantly, these programs were systematically selected with known probabilities from a rigorously developed

sampling framework, so that those followed up were representative of all participants in treatment in the selected modalities in California.

As authorized by federal and State law and permitted by consent obtained routinely on admission to treatment, the program records of participants selected for the followup sample were read and abstracted to determine important research information such as admission and discharge dates, specific services received, and information that would enable CALDATA staff to locate and interview respondents about their behavior and experience before, during, and after treatment. Using a combination of methods including recruitment letters and postcards, telephone calls, visits to last known addresses, contacting relatives or institutional connections, and searching various accessible public records, CALDATA staff sought to locate members of the sample and seek their participation in the study. In order to protect the privacy of respondents, strict confidentiality was maintained throughout the data collection period concerning the precise nature of the research and reasons why individuals were part of the sample.

More than 1,850 individuals drawn from 83 cooperating providers were successfully contacted and interviewed in 9 months. The participant followup interview was developed for CALDATA based on extensive work with previous treatment effectiveness studies. The questionnaire took approximately one hour and fifteen minutes to administer on average. Followup interviews occurred an average of 15 months after treatment, with the longest interval being 24 months. Part of the sample was comprised of individuals who were in continuing methadone maintenance treatment, since this type of treatment is meant to continue indefinitely for a significant proportion of those enrolled in it.

CALDATA was designed to reveal three major elements: the effects of treatment on participant behavior, the costs of treatment, and the economic value of treatment to society. The effects of treatment are the differences in behavior and experience reported by respondents before and after (and for some items, during) treatment, controlled statistically for other possible sources of variation. The costs of treatment were calculated from financial information collected directly from the providers involved in CALDATA. These cost figures have been checked for consistency with other data about these programs and are quite consistent with other study results on treatment costs. The economic valuation of benefits of treatment was based largely on calculating the "costs avoided" due to reductions in the burden of crime and illness, as well as a careful review of shifts in income sources as reported by the respondents.

Some of the results of this study were essentially first reports in the research literature—such as the detailed coverage of social model programs and the side-by-side comparison of results for alcohol, cocaine, and heroin. The particular measures and sampling approach used provide a fresh set of numbers in several key domains. However, the broad outlines of CALDATA results on the effectiveness of treatment are quite consistent with those of important earlier studies using similar as well as contrasting research designs.

Findings on the Effectiveness of Treatment

- ***Alcohol/drug use, crime, and health care—good results*** CALDATA recorded major declines from before treatment to after treatment in the use of alcohol and drugs, which decreased by about two-fifths, and in the level of criminal activities, which declined by about two-thirds. There were also significant improvements in health and corresponding reductions in hospitalization by about one-third. The more substantial effects on criminal activities may be because treatment could affect the prevalence and incidence of criminal activity in two major ways. Treatment could directly affect criminal activity by strengthening or providing new affiliations and moral commitments to counter and supplant the ones that supported criminal activities in the past. And treatment could indirectly affect criminal activity by reducing the economic motivations for crime to obtain money to buy drugs or alcohol.

- ***Differences by substance*** There has been concern that stimulants, and crack cocaine especially, might be much more intractable to treatment than more familiar drugs such as alcohol or heroin. However, treatment for problems with the major stimulant drugs (crack cocaine, powdered cocaine, and methamphetamine, which were all in widespread use) was found to be just as effective as treatment for alcohol problems, and somewhat more effective than treatment for heroin problems.

- ***No gender, age, or ethnic differences*** For each type of treatment studied, there were slight or no differences in effectiveness between men and women, younger and older participants, or among blacks, Hispanics, and whites.

- ***Ethnic differences in selecting treatments*** There were ethnic differences in the selection of treatment providers and in reported main drugs. Compared with nonHispanic whites in treatment, the Hispanics in treatment were concentrated disproportionately in methadone programs for heroin addiction while blacks were clustered disproportionately in residential programs (primarily for alcohol and cocaine).

- ***Employment and earnings—not a bright spot*** The employment and earnings situations of participants, which were not good to begin with, did not improve and to some extent worsened after treatment. About 35-45% of participants in each type of treatment had some full-time work during the year before treatment began. However, employment rates and job earnings of those discharged from methadone declined by one-third after treatment. Participants in residential programs, particularly longer term residents, maintained or improved their levels of employment, but with lower earnings than before treatment. Participants in other types of treatment fell in between the methadone and residential results.

- ***Disability and MediCal—greater dependency*** In every type of treatment there were greater levels of enrollment and payments received from disability and MediCal after treatment; these increases ranged from one-sixth to one-half and were particularly prominent among methadone

and social model participants. The before-after increases in the percent receiving disability income and in mean annual income from disability resulted from a different process than trends in health, employment, and criminal activity discussed above. The analysis of health trends showed that individuals in alcohol or drug treatment did not become more disabled than before. They became more readily certifiable as disabled under current statutes, however, because alcohol or drug dependence is an acknowledged disability, and treatment serves as evidence for its presence. So treatment increased the eligibility to receive disability payments even though it actually led to overall improvements in health status.

Findings on the Costs and Benefits of Treatment

- ***How costs and benefits were calculated*** The costs of treatment were calculated directly from provider information. The economic benefits of treatment were calculated two ways: benefits to taxpaying citizens and benefits to the total society. The major difference is that taxpaying citizens benefit when there is less theft and other crime and when the state makes fewer drug-related disability payments and other welfare-type transfers. However, these transfers of income and property are considered economically neutral to the total society, since one person's loss equals another's gain.

- ***Costs and benefits to taxpaying citizens*** The costs of treating approximately 150,000 participants represented by the CALDATA sample in 1992 were approximately $200 million, while the benefits received during treatment and in the first year afterwards were worth approximately one and one-half billion dollars in savings to taxpaying citizens, due mostly to reductions in crime.

- ***Daily tradeoff*** Each day of treatment paid for itself (the benefits to taxpaying citizens equaled or exceeded the costs) on the day it was received.

- ***Benefit:cost ratios for taxpaying citizens*** We calculated that the near-term benefits of alcohol and drug treatment to taxpaying citizens (the benefits that accrued during treatment and in the first year after discharge) outweighed the costs of treatment by ratios from 4:1 to greater than 12:1 depending on the type of treatment.

- ***Benefit:cost ratios for the total society*** The near-term benefit:cost ratios for the total society ranged from 2:1 to more than 4:1 depending on the type of treatment--except that for methadone episodes ending in discharge, there were net losses—mainly earnings losses to the participants themselves—rather than net benefits.

- ***Differences by treatment types*** The smallest single-episode gains to taxpaying citizens were for individuals discharged from methadone treatment for heroin problems. The largest single-episode gains to taxpaying citizens came from treatment in residential programs (primarily involving alcohol and cocaine problems). However, the average residential stay cost approximately ten times as much as the average methadone-discharge stay (both averaged about two months long). The benefit:cost ratio for taxpaying citizens was therefore highest for

discharged methadone participants, lowest—but still clearly favorable—for participants in residential programs, including social model recovery houses.

- ***Projection of benefits*** after treatment persisted through the second year of followup when that was observed, which suggests that projected cumulative lifetime benefits of treatment will be substantially higher than the shorter-term figures. However, the limited number of participants followed up for as long as two years and the additional recovery services received by approximately one-third of participants during the followup period make lifetime treatment benefit:cost ratios difficult to estimate reliably. A second round of followup interviews and analyses would permit a more solid projection of lifetime treatment costs and benefits.

1 The Purpose, Nature and Schedule of the Study

The California Drug and Alcohol Treatment Assessment (CALDATA) is at the leading edge of a new wave of research into the effectiveness, costs, and benefits of recovery services for substance abuse. There have been limited studies of the recovery of participants in one or another sort of substance abuse program, but no broad and solid set of statistics for recovery services overall in the 1990s, either in the state of California or in the nation as a whole.

The California Department of Alcohol and Drug Programs (ADP), under the leadership of Andrew Mecca, undertook in 1991 to increase the availability and reliability of data on the epidemiology and outcomes of treatment/recovery services in California so as to better inform policy decisions at the State and local level. ADP supported CALDATA with funds from California's federal block grant from the US Department of Health and Human Services. In accord with the California Master Plan for alcohol and drug abuse, CALDATA was designed as a voluntary survey to provide data representative of alcohol and drug recovery services throughout California and to assess the costs and benefits of services available to publicly supported participants.

The National Opinion Research Center (NORC) at the University of Chicago contracted with ADP to develop technical specifications for CALDATA, to perform the data collection, and to analyze the data in association with Lewin-VHI, Inc., a health policy consulting and analysis firm based in Fairfax, Virginia and San Francisco.

As the California Outcomes Study (COS), CALDATA gathered outcome data in two phases. The first phase involved systematic selection by random sampling of counties, providers, and participants in four types of treatment programs in California specified by ADP: residential programs, residential "social model" programs in particular, outpatient programs in general, and outpatient-methadone. Participants were selected by NORC from discharge (or in-treatment) lists developed on site at cooperating providers using state-of-the art statistical procedures. Sixteen counties, 110 programs, and approximately 3000 participants who received treatment or were discharged between October 1, 1991, and September 30, 1992 were included in the study sample. The number of programs involved in CALDATA was larger than any prior treatment followup study; but more significantly, these programs were systematically selected with known probabilities from a rigorously developed sampling framework, so that those followed up were representative of all participants in treatment in the selected modalities in California.

As authorized by federal and State law and permitted by consent obtained routinely on admission to treatment, the program records of participants selected for the followup sample were abstracted to determine important research information such as admission and discharge

dates, specific services received, and information that would enable CALDATA staff to locate and interview respondents about their behavior and experience before, during, and after treatment. In the second phase of the study, using a combination of methods including recruitment letters and postcards, telephone calls, visits to last known addresses, contacting relatives or institutional connections, and searching various accessible public records, CALDATA staff sought to locate members of the sample and seek their participation in the study. In order to protect the privacy of respondents, strict confidentiality was maintained throughout the data collection period concerning the precise nature of the research and reasons why individuals were part of the sample. Details concerning the statutory authority for the study, including prior consent on the part of participants, and the methods used to locate respondents, elicit cooperation, guarantee privacy and confidentiality, and otherwise collect and process survey data are provided in subsequent chapters and supplements to this report.

Phase I--sample construction, program recruitment, and records abstraction--was originally scheduled to begin July 1, 1992 and last four months. The field period for collecting participant interviews was planned to be approximately 10 months beginning November 1992, leaving approximately 6 months beginning in September 1993 to complete the data editing and processing, perform statistical data analysis, and submit a final report by February 28, 1994. The original schedule, along with the actual schedule is summarized below.

Schedule

Task	Original Schedule	Task months	Elapsed months	*Actual* Schedule	Task months	Elapsed months
Begin Phase 1	Jul 1, 1992		0	Sep 1, 1992		2
Sample selection	Jul 1-Sep 1	(2)	2	Sep 1-Nov 1	(2)	4
Records Abstracting	Sep 1-Nov 1	(2)	4	Nov 1-Feb 28, 93	(4)	8
*Enhanced recruitment				"	(")	8
*Revised methadone sample				Jan 1-Apr 30, 93	(")	10
*Sample adjustment (trims)				"	(")	10
*Instrument development & testing				Nov 1-Feb 28, 93	(")	8
Begin Phase 2	Nov 1, 1992		4	Mar 1, 1993		8
* Debriefing Report			3 Oct 1, 1993	(6)		15
* Deliver 2/3 of completes				Oct 1, 1993	(")	15
Finish Fieldwork	Sep 1, 1993	(10)	14	*Dec 1, 1993*	*(3)*	*17*
* Provisional Report				Feb 28, 1994	(3)	20
Final Reports	Feb 28, 1994	(6)	20	*Apr 1, 1994*	*(1)*	*21*
	Jun 30, 1994					24

* Additions to original tasks

The project schedule was revised for several reasons. First, due to early contract processing delays in Sacramento, work actually began in September, 1992. The preliminary task of questionnaire development and pretesting, expected to be completed prior to November 1992 for the Services Research Outcomes Study (SROS), was delayed by the temporary suspension of that study's activities due to clearance delays and administrative reorganization in the federal government. Therefore some additional time was required to complete the design work after November 1, 1992. Delay also resulted from resistance on the part of county executives and

provider associations toward participation in the study. NORC and ADP made special presentations to these groups and NORC modified the methadone sampling methodology to include a supplementary sample of continuing methadone maintenance participants. Further delay resulted from the need to trim the entire sample due to overestimation of discharges based on information contained in the CADDS database.

Phase 2--locating, contacting, securing informed consent, and conducting participant interviews--began in March 1993 with the training of approximately 55 field interviewers. Some important State governmental preliminaries, such as gaining the formal cooperation of agencies such as Motor Vehicles, Public Assistance, and Corrections, were not yet completed at the time and moved to completion during the field period at various rates of speed.

More than 1,850 individuals were successfully contacted, agreed to participate, and were interviewed. The participant followup interview was developed for CALDATA based on extensive work with previous treatment effectiveness studies. The questionnaire took approximately one hour and fifteen minutes to administer on average, and employed a variety of memory aids, including a large-format calendar and colored markers to identify specific time periods such as before, during, and after treatment as well as significant life events; and a series of showcards listing specific categories for responding to questions about quantities and time periods. Followup interviews occurred an average of 15 months after treatment, with the longest interval being 24 months. Part of the sample, however, was comprised of individuals who were in continuing methadone maintenance treatment, since this type of treatment is meant to continue indefinitely for a significant proportion of those enrolled in it.

In order to help direct the analytical work on interview data and provide some early leads on project findings, the Principal Investigator debriefed eight interviewers selected by the field management staff in August, 1993. At the time of the debriefing, these interviewers had collectively completed approximately 250 interviews in all geographic regions of the State and all five CALDATA-selected treatment modalities. Seven of the eight interviewers had been assigned cases from two or more treatment modalities, providing them a perspective from which to make some comparisons across modalities. The complete Debriefing Report is contained in Supplement 4 to this report.

The debriefing was impressionistic. The number of interviews represented was too small for quantitative assessment, and the completed questionnaires were not available for interviewers to study when responding to debriefing questions. The questionnaires were not retained by the interviewers but forwarded as each was completed to the NORC site and central offices, where they were edited and keyed in using computer-assisted data entry.

Data from the first 1,600 interviews was delivered to the analysis team in mid-October, along with records abstraction data for the entire sample. The provider questionnaire data and California Alcohol and Drug Data System (CADDS) and National Drug and Alcohol Treatment Unit Survey (NDATUS) information on the universe of providers in California were delivered in September, and preliminary analyses of these data sets began at that time. This data was used

to prepare a provisional report on treatment experience, outcomes, and cost-benefits for ADP by February 28, 1994. This was in correspondence with the original schedule, despite the delays in beginning the work which were beyond NORC's control. We continued fielding the study into January, 1994, which allowed us to come much closer to the targeted response rate, improving the precision of the sample and capabilities for subgroup analysis. We then analyzed and reported on the complete data set in the General Report submitted to ADP in April, 1994.

The analysis of CALDATA results hinges on changes in respondent behavior and experience over time—particularly before treatment, during treatment, and after treatment. While a large number of outcome studies focus on the day, week, or month before admission and after discharge, CALDATA uses one-year baseline and post-treatment periods as standards, in accord with the findings of earlier important substance abuse treatment outcome studies (Sells and Simpson, 1976; Hubbard et al., 1989; Ball and Ross, 1991).

CALDATA was designed to reveal three major elements: the effects of treatment on participant behavior, the costs of treatment, and the economic value of treatment to society. The effects of treatment are the differences in behavior and experience reported by respondents before and after (and for some items, during) treatment, controlled statistically for other possible sources of variation. Some of the results of this study are reported here for the first time in the literature—such as the detailed coverage of social model programs and the systematic side-by-side comparisons of results for alcohol, stimulants, and heroin. Even for more familiar statistics, such as the effects of methadone and residential programs on criminal activity, the particular measures and the sampling approach used provide fresher and more representative numbers than were previously available in several key domains. The broad outlines of our results on the effectiveness of treatment, however, are quite consistent with those of important earlier studies using prospective and retrospective designs.

The costs of treatment are calculated from financial information collected directly from the providers involved in CALDATA. These cost figures have been checked for consistency with other data about these programs and are quite consistent with other study results on treatment costs. The economic valuation of benefits of treatment was based largely on calculating the "costs avoided" due to reductions in the burden of crime and illness, as well as a careful review of shifts in income sources as reported by the respondents. The cost-benefit methodologies are described later in this report.

2 Who was Studied

The Sample of Providers

CALDATA took as its population for study all those receiving any of four types of recovery services (referred to as "the treatment modalities") from California-based treatment providers known to the California Alcohol and Drug Data System (CADDS) as of September 1992. The CADDS programs include all providers who received any type of public funding for treatment or recovery services, including grants, contracts, MediCal reimbursements, etc., during the current or previous fiscal years or who are required to report to CADDS as a condition of state licensing. The guiding objective was to ensure that each participant in the four designated types of recovery services would be given a comparable chance with every other participant to be chosen for the followup sample, and to carefully document every step of the process so that, in the end, those actually interviewed could be related using strict statistical principles to this original population of participants.

There were three stages in selecting the sample of participants. (The sampling approach is summarized here; full details are provided in Appendix 1). First, 16 of California's 58 counties were selected for inclusion, using as criteria geographic diversity and numbers of participants in alcohol and drug recovery services in each county according to CADDS. To ensure appropriate coverage, four geographic strata were identified (Bay Area, Southern Urban, Central Valley, and Mountain/Rim). Because of their size, six counties (Los Angeles, San Francisco, San Diego, Orange, Alameda, and San Bernardino) were selected with certainty (probability equals 1.00). The smallest counties were clustered based on geography to provide sufficiently large sampling units, so that every county had at least a one in eight chance of being picked. A randomized procedure, with selection chances weighted by the number of participants, was then used to select ten more counties: San Mateo, Santa Clara, Tehama, Riverside, Solano, Sacramento, Stanislaus, Fresno, and Kern counties. These 16 counties include approximately five-sixths of the state's population and participants in treatment. The county administrators responsible for public funding of alcohol and drug treatment in each county were consulted about the study and gave full support to it.

The second stage of sampling was to select providers within these counties, using similar principles of geographically balanced, size-weighted random selection. Since CALDATA was intended to consider results for each of the four modalities separately, we sought to roughly equalize the numbers of participants to be chosen in each. Statistical power considerations suggested that at least 400 participants should in the end be interviewed, and sufficient numbers of providers would need to be chosen to reach this goal, taking into account expected sample attrition from a variety of causes. Since there were wide variations in the size of provider units, including differences in average size by type of treatment, and in the numbers of providers of each type, the final count of providers differed somewhat from modality to modality, and as

with the smallest counties, the smallest providers were clustered together to provide adequate sized sampling units. The results of the selection process among modalities were as follows:

- Residential Treatment in general; 21 programs were selected. A variety of recovery service approaches are employed in residential settings, which can provide heavily structured and controlled environments. Some residential programs are oriented more toward individual counselling and a classical staff/therapist model, others stress group interaction or a gradual climb through successive roles and responsibilities as a milieu for assimilating new ideas, norms, and behaviors.

- Social Model Recovery Houses; 23 programs were selected. These are a particular type of residential programs seen more in California than other States, which focus on recovering alcoholics, stressing peer support and communal sober living.

- Outpatient NonMethadone; 29 programs were selected. Outpatient programs, exclusive of those providing daily methadone doses, encompass great variety, from one hour/week one-to-one counselling that may be focused on practical, emotional, spiritual, or other issues; to daily or multiple weekly individual or group sessions that may focus on these matters or on the 12 Steps (as in Alcoholics Anonymous or Narcotics Anonymous). Some programs include substantial medical or psychiatric elements, others none at all.

- Methadone Programs--two subtypes:

  - Methadone Maintenance Outpatient; 18 providers were selected. In maintenance, a stable daily oral dose of methadone hydrochloride, accompanied by other available non-residential services such as counselling, is provided to formerly heroin-dependent participants on an indefinite basis. Maintenance is open only to those who have either relapsed to heroin use following three or more previous treatments, are pregnant, or are HIV-positive. Methadone in appropriate doses prevents withdrawal symptoms and maintains a level baseline of physical comfort and functioning with virtually no psychological or physiological impairment.

  - Detoxification; 19 programs were selected. Methadone detoxification means support for planned withdrawal from heroin (sometimes other opiate) dependence using a gradually tapering dose of methadone hydrochloride, lasting a maximum of 21 days.

The two methadone provider groups were selected separately but the samples in fact overlapped, since most methadone providers offer both detoxification and maintenance treatment using the same facility and staffing. There were 7 dually sampled methadone providers, so the methadone stratum actually comprised 30 distinct providers. Two providers outside of the methadone group were dually sampled (selected in two different strata); each provided both residential and outpatient services. Consequently, the total number of unique providers in the sample was 110 - 9 = 101. All of these 101 providers were contacted for the study. Four of these providers proved to have no eligible treatment cases during the focal year of eligibility for the study, and were therefore deemed ineligible for inclusion. Of the remaining

97 eligible providers, 83 agreed to be part of the study involving 87 programs. This entailed completion of a Provider Questionnaire and giving CALDATA permission to enumerate their discharged cases from on-site records, select a sample of participants for followup, and abstract specific information from this sample's records. One of these providers withdrew from the study after the sample records and abstracts were completed, and several providers did not complete the Provider Questionnaire. Therefore 82 providers and 86 programs were directly represented by participants in the CALDATA followup sample, and 76 completed Provider Questionnaires, which covered various clinical and financial dimensions of the programs. These questionnaires verified and quantified differences among modalities and among providers within modalities. A freestanding analysis of the Provider Questionnaire data was prepared for ADP and is included in Supplement 4 to this report.

In addition to the Provider Questionnaires, more than half of the cooperating providers supplied financial statements or auditors' reports, and a number of them supplied evaluation reports as well, mostly reports based on records or on in-treatment data.

The Sample of Participants

CALDATA staff completed two major operations at each of the 83 provider sites which became part of CALDATA. First, they created an on-site listing of all participants in treatment who were eligible for sampling. These master eligibility lists (identified only by program ID numbers) were of two types. The first type, by far the major component, was the list at every site of all those who were discharged from an episode of treatment during the 12 calendar months beginning October 1, 1991. A much smaller component was a list at methadone maintenance sites only of those currently enrolled in a long-term course of treatment. These second lists were the basis for a *continuing methadone maintenance* (CMM) sample.

Once these lists were made, samples were chosen at random at each site, with the number chosen varying depending on the size of the provider and the extent to which the on-site listing matched the number expected based on the CADDS data for that provider. The CADDS system was relatively new and included less than one year's data, so some deviations due to the need to extrapolate the numbers expected and due to start-up bugs in procedures could be expected. At most providers a sample of approximately 31 cases was called for. Generally, at the smaller sites CALDATA took higher sampling fractions (up to the limit of choosing every eligible case), while for larger programs the fraction was lower. In a few of the larger sites, double samples (that is, about 62 cases) were taken; for one large program which was the major provider for a multi-county area, a quadruple-sample was specified.

After these samples were chosen, CALDATA staff abstracted the records of these participants. This information had two uses: as one source of information about certain characteristics of the entire sample, and as the base on which individuals were identified and efforts to locate and interview them were begun. The field data collection period for CALDATA was approximately 9 months, relatively short by long-term follow-up study standards, but a cut-off necessitated by the policy requirements of the State of California. The base sample was

comprised of 3,055 individuals. Some of these proved to be duplicates; more than 50--approximately 2% of the total--were found to be deceased since the time of discharge. CALDATA ascertained locations for all but about 500 members of the sample during the 9 months of the data collection. Approximately 7% refused to participate in the study for various reasons; this number is commensurate with survey efforts on a wide variety of subjects and samples. Among the remainder, language problems, physical incapacitation, inaccessible locations (even by telephone), and other reasons accounted for no interviews being recorded. Some of the cases were located too late in the field period for the full set of recruitment efforts--starting with mail and telephone and moving on to more personal contact--to be undertaken. CALDATA recorded 1,859 interviews at the time data collection ceased, and the final 33 were completed too late for the paper and pencil questionnaires to be reviewed, keyed in, and added to the data analyzed for the General Report.

Evaluation of Response and Nonresponse

The CALDATA design permits a full accounting and review of response rates and assessment of the extent to which the conclusions of the General Report may be subject to inaccuracy or bias because of nonresponse. This analysis comprises four sections. First, we provide an assessment of overall response based on analyzing nonresponse due to two sources: a) provider noncooperation and b) participant nonresponse in cooperating providers. This section also discusses the weights, adjusted for provider and participant nonresponse, that we use in the General Report to make inferences about the California population of treatment participants. (See Appendix 2 for documentation of participant response rates and weighting). The second section assesses bias due to the first source of nonresponse by comparing CALDATA information on characteristics of responding providers in each modality to data collected in California by ADP for the National Drug and Alcohol Treatment Unit Survey (NDATUS) on the corresponding target population of providers. The third section assesses bias due to the second source of nonresponse by comparing characteristics of responding and nonresponding sample participants which we abstracted from the administrative records of cooperating providers. The final section summarizes our findings about the impact of nonresponse.

Response Rates and Sample Weights

The overall CALDATA participant response rate equals approximately 50% for the discharge sample (weighted or unweighted) and approximately 46% for the CMM sample (weighted or unweighted). In CALDATA, there were two sources of participant nonresponse:

- ***Provider noncooperation***. Sample participants whose sample episodes took place in providers that did not cooperate in the survey were nonrespondents. To estimate nonresponse due to this source, we assumed CADDS undercount/overcount, ineligibles, duplicates, and changes in participant sampling rates during the field period would have had the same proportionate effects in noncooperating as in cooperating providers. We made these assumptions separately within each modality of the discharge sample and also assumed that

these factors had the same proportionate effect in the methadone maintenance discharge sample and the continuing methadone maintenance sample. To adjust for provider noncooperation in our analyses, we multiplied the sampling weight of each respondent (i.e., the inverse of the probability of selection) by the inverse of the weighted provider response rate in the modality.

- ***Participant nonresponse in cooperating providers***. Sample participants in cooperating providers were nonrespondents either because they could not be located or because they refused to be interviewed. Participant nonresponse adjustment factors were computed at the level of individual cooperating sample providers. To adjust for participant nonresponse, we multiplied the sampling weight of each respondent in each cooperating sample provider by the inverse of the response rate within the provider.

In summary, the final nonresponse-adjusted weights of respondents as employed in our analyses were the product of a) the selection probability of the respondent, b) the provider nonresponse adjustment factor of the modality (or CMM sample) and c) the participant nonresponse adjustment factor of the provider. The response rates of each modality were weighted to take into account the differing probabilities of selection of sample providers and participants. Each overall response rate is the product of a response rate based on provider cooperation and a response rate based on participant response within cooperating providers. More detailed information on the sample weights, and nonresponse adjustments to the weights is given in Appendix 2 to this report.

Bias Due to Noncooperating Providers

Participant response rates based strictly on provider cooperation were greater than 90% in the residential and social model strata, greater than 75% in nonmethadone outpatient (even though 85% of the sampled providers did cooperate; the difference being attributable to the high weights of the noncooperating providers), and less than 75% in both methadone detoxification and methadone maintenance. The lower provider cooperation rate among methadone programs was due very largely to blanket noncooperation by owners of two large chains of proprietary (for-profit) methadone facilities. The noncooperating owners did not offer written explanations for their nonresponse. Based on our overall experience, we surmise that the owners of these facilities were simply opposed to having independent research conducted on their premises.

To quantitatively assess the bias due to provider noncooperation, we compared survey response distributions on a number of participant and provider characteristics to corresponding distributions computed using the California subfile of the FY90-91 NDATUS, in particular, three participant-level characteristics, i.e., age (less than 25, 25-34, 35 and over), sex, and ethnicity (Black, Hispanic), and one provider-level characteristic, i.e., average weekly staff hours of physicians, psychiatrists, and registered nurses per 100 participants.

Since CALDATA modalities cannot be as precisely identified using NDATUS information as was possible with CADDS, each comparison was presented separately for two broad modalities that can be comparably defined using the two data sources: residential (including

social model and other residential programs) and methadone (including both detoxification and maintenance programs). The results for NDATUS were based on population totals for California of 423 residential programs and 87 methadone programs. The results for CALDATA were based on samples of 38 cooperating residential programs and 20 cooperating methadone programs.

For both residential and methadone providers, the CALDATA and NDATUS distributions of participants by age, sex, and ethnicity were broadly similar. The two data sources agree that methadone participants tended to be older than residential participants, more likely to be female (especially in CALDATA), more likely to Hispanic, and less likely to be Black. The two data sources also lead to similar conclusions about the degree of staffing of physicians, psychiatrists, and registered nurses in the two kinds of programs. Both data sources estimate the level of staffing of these highly trained professionals to have been approximately 6-7 times higher in methadone programs than in residential programs. These results suggest that bias in the CALDATA results due to provider noncooperation may not be severe in the residential and methadone modalities.

Bias Due to Participant Nonresponse Within Cooperating Providers

The response rate based on participant nonresponse in cooperating providers equals 61% or lower in every modality with the exception of methadone maintenance discharge (76.5%). Information on detailed interview dispositions that were collected as part of the field effort (described later in this report) indicate that more than 60% of the participant nonresponses in every modality were attributable to failure to locate the sample participant rather than to the sample participant's refusal to participate in the survey.

We also compared characteristics of responding and nonresponding sample participants using data that were abstracted from the administrative records of cooperating providers. We compared the means of continuous variables, and compared percentages. Participant abstraction records were successfully merged to data on interview dispositions for 3001 sample participants, 1821 CALDATA respondents and 1180 CALDATA nonrespondents. The total of successfully merged abstraction records is very close to the total CALDATA participant sample.

Our main conclusion was that few continuous or categorical variables evidenced substantial differences between respondents and nonrespondents. Even statistically significant differences, as gauged by two-sample tests for comparisons of continuous variables and chi-square tests for comparisons of percentages, tended to be substantively small. The large sample sizes available for most of these comparisons portend that even small differences would attain statistical significance at conventional levels.

The few differences that were substantively as well as statistically significant results tended to occur when there was substantial item nonresponse in one or both comparison groups. For example, the percent Hispanic was estimated to equal 37% for CALDATA unit respondents and only 30% for CALDATA unit nonrespondents. However, the item nonresponse for this variable

was greater than 20% in both comparison groups, i.e., 100 x (1821 - 1319)/1821 = 28% among unit respondents and 100 x (1180 - 929)/1180 = 21% among unit nonrespondents. This suggests the difference in percent Hispanic might be due to item nonresponse bias rather than to any systematic difference between unit respondents and unit nonrespondents. The overall concordance of means and percentages between comparison groups suggests that the conclusions of the General Report are not severely biased by participant nonresponse within cooperating providers.

Summary of Findings on Nonresponse

Neither the analysis of provider noncooperation nor the analysis of participant nonresponse in cooperating providers, produced strong evidence of biases in the conclusions of the General Report due to nonresponse. Both the comparisons of CALDATA to NDATUS and the comparisons of CALDATA respondents and nonrespondents using administrative records suggested respondents and nonrespondents were similar in demographic characteristics. The results are more compelling because of the wide variety of participant characteristics, including measures of pre-treatment and within-treatment substance use and treatment services, that could be comparably measured using administrative records. Our leading hypotheses to account for the generally small differences between respondents and nonrespondents are that nonresponse at the level of individual participants resulted primarily from poor-quality address and other locating information (criminal justice, hospital, social security, etc.) obtained from the provider discussed further in subsequent chapters; and the quality of locating information available from providers was largely independent of the attributes and treatment outcomes of individual participants.

3 Analytical Methods

Research Design, Measurement, and Statistical Methods

To evaluate the effects of treatment on drug and alcohol use, criminal activity, health and health care utilization, and sources of income, respectively, a research design commonly known as the "before-after" or "pre/post" design was employed. The basic idea was to measure and compare the same behaviors/characteristics of the same subjects before and after treatment.

Relative to the "independent-samples" or "repeated cross-section" design, a design in which two different samples of individuals are used to estimate the before-treatment and after-treatment distributions of characteristics, the before-after design has two major advantages:

- ***Control for individual differences*** The before-after design allows each subject to serve as his or her "own control." This means behaviors/characteristics which tend to be permanent or semi-permanent in the life cycles of individuals (e.g., gender, ethnicity, personal appearance, early experience and upbringing, and many aspects of character, life-style, and personality) can be eliminated as possible causes of apparent treatment effects. For example, since sample treatment participants have exactly the same distribution by ethnicity before and after treatment, i.e., the same percentages who are Black, Hispanic, Native American, and so on, we can dismiss the possibility that all the treatment effects are actually attributable to differences in ethnic composition rather than to the effects of treatment *per se*, and we can evaluate the extent to which treatment effects differ among these groups.

- ***Detailed analysis of change*** The before-after design offers the opportunity to analyze "gross changes" at the individual level. This means it is possible to identify the particular individuals who have changed their behaviors or characteristics between the before-treatment and after-treatment reference periods, to establish the nature of the individual changes, and to determine in what ways certain kinds of changers differ from each other and from nonchangers.

In the General Report, each section evaluating the effects of the treatment exploits in turn the first and second advantages of the before-after design. Each section begins with a "global analysis" of a variety of measures of the class of outcomes that is the focus of the section. By "global analysis," we mean an analysis of "overall" or "net" before-after differences That is, each global analysis combines the data for all individuals and subclasses of the sample. This combining of data affords the single most powerful and discriminating test of the hypothesis of a "treatment effect," i.e., the hypothesis that drug or alcohol treatment caused a before-after change in a mean or a percentage summarizing information for the entire sample.

A series of more "detailed analyses" is then presented, aimed at identifying subclasses of the sample where before-after changes were especially large or small. Next, changes within

subclasses defined by the following control variables are looked at successively: treatment modality (residential, social model, nonmethadone outpatient, methadone discharged, methadone continuing), length of treatment (1 month or less, 2-3 months, 4 months or more), treatment modality crossed by length of treatment, main drug at peak usage (alcohol, heroin, other), sex and age, and ethnicity and sex. The detailed analyses result in more precise characterizations of the subclasses of the treatment population where before-after changes did and did not occur and in more refined hypotheses about the nature of changes that occurred at the individual level.

The key feature of our measurement strategy was *retrospective reporting*. This means we depended upon the retrospective recall abilities of sample respondents to measure the presence or absence and the levels of behaviors/characteristics during the before-treatment and after-treatment reference periods, e.g., whether or not the respondent used heroin and, if so, at what level.

The "before" measurements are retrospective reports of behaviors/characteristics during the 12 months immediately before the sample treatment episode. The "after" measurements are retrospective reports of behaviors/characteristics between discharge from the sample episode and the time of the CALDATA interview. The analysis of changes in criminal activity also presents statistics based on "during" measurements, i.e., retrospective reports of behaviors/ characteristics during the sample treatment episode. To enhance comparability with the before-treatment period, which always lasted exactly 12 months, we adjusted estimated means for the during-treatment and after-treatment periods in the following sections to a per annum basis. In cases of behaviors or characteristics that can be assumed to be relatively rare or infrequent, we also adjusted percentages to a per annum basis.

The pre-post approach was selected because it has significant methodological strengths in relation to potential sources of error; a proven track record in the evaluation of drug treatment and other types of interventions; and capability to be carried out rapidly and economically compared to other methods. The particular features of the design were shaped to deal as effectively as possible with five issues concerning potential measurement error, issues that every responsible study of behavioral change over time is required to address. These issues are as follows:

- ***Recall decay*** This refers to reductions in reporting of behaviors due to the respondent's difficulties in remembering events. Generally, one sees greater reductions in the reporting of earlier events, characteristics, and behaviors, i.e., those that are more distant in time from the date of reporting. The data collection procedures of CALDATA were expressly designed to minimize potential biases due to recall decay. We sought to minimize these sources of inaccuracy by measuring highly salient behaviors/ characteristics, i.e., ones likely to be remembered, and by focusing on recent time periods. For almost all sample participants, the earliest reference period, i.e., the before-treatment period, extended no more than three years into the past at the time of the CALDATA interview. For most of the critical comparisons of the General Report, such as the before-after comparisons of criminal activity, recall decay

would tend to work in the opposite direction from the expected direction of a treatment effect. That is, based on recall decay alone, we would expect more reported criminal activity in the after-treatment period than in the before-treatment period, whereas, based on the hypothesis of a beneficial treatment effect, we would expect *less* reported criminal activity in the after-treatment period. Whenever such measurement biases work in the opposite direction, a finding of beneficial treatment effects is strengthened rather than weakened by the possibility of recall decay.

- ***Telescoping*** This is the allocation of events, characteristics, or behaviors to an earlier or later time period than the one in which they actually occurred. We sought to minimize telescoping by designing the interview to repeatedly focus respondents' attention on the reference period of each question and to associate the beginning and end dates of reference periods with memorable events such as the beginning and end of the sample treatment episode. The general effect of telescoping is not to induce bias in one direction or another but rather to raise the overall level of "noise" in the data, making it harder to detect signals such as evidence of treatment effectiveness.

- ***Underreporting of sensitive behaviors*** The concern here is reduction in the numbers of events, characteristics, or behaviors reported, due to reluctance of persons to reveal socially undesirable traits. We minimized underreporting by carefully selecting and training interviewers in nonjudgmental but probing interviewing techniques; by carefully explaining and repeatedly emphasizing to respondents the confidentiality and purposes of the data collection; by framing questions in ways that have previously been shown to elicit sensitive behavior most readily; and by relying most heavily on analysis of the types of items least subject to underreporting bias.

- ***Reversion to more typical behavior*** Previous studies of treatment show that the period immediately prior to admission tends to be higher in drug and alcohol use and associated criminal behaviors relative than in earlier or later periods of the same respondent's adult life; these unusually high levels of substance abuse or other deviance are among the factors that induce respondents to enter treatment. Therefore, lower levels of criminal activity after treatment can to some extent be described to some extent as a reversion to more typical behavior patterns rather an effect of treatment as such. Studies which use short baseline and posttreatment periods, such as the day or week of admission or discharge, are especially vulnerable to these reversion effects. However, in studies which use yearlong periods, as in CALDATA, the longer recall periods smooth out these pre-admission "bumps".

- ***Differential nonresponse*** If participants with beneficial treatment effects were more likely to respond to the survey than participants without beneficial treatment effects, this pattern of nonresponse would cause the average treatment effect to be overestimated. However, our analysis of response/nonresponse using data in program records from both groups yielded little evidence of such a differential nonresponse.

Significance Testing and Statistical Adjustments

The statistical methods applied are standard methods that are discussed in statistics textbooks. We used paired t-tests to test the significance of before-after changes and ANOVA F-tests to test whether before-after changes differ significantly among subclasses. As discussed in the section on "Evaluation of Response and Nonresponse", the estimates of means and percentages reported in our tables were weighted to take into account the probabilities of sample selection and the response rates at the provider and participant levels.

The standard errors of means and percents that we used to test for statistical significance were not fully adjusted to take into account complex sampling. These standard errors do take into account the decrease in precision due to unequal weighting, using an adjustment technique discussed by Potthoff and colleagues, but the standard errors do not take into account the decrease in precision due to the clustering of sample participants within sample providers. This implies the true standard errors are probably somewhat larger than reported and that the true significance levels of tests are somewhat larger than the conventional $\alpha = .05$ level. Due to the generally large sample sizes, however, the attained significance levels of significant before-after changes reported in the following are ordinarily substantially smaller than .05. Preliminary calculations of complex sampling standard errors using the technique of linear approximation suggest the decrease in sample precision due to clustering of sample participants within sample providers is not large for most of the behaviors/ characteristics measured in CALDATA**.**

Cost/Benefit Methodology

In the General Report, we also presented findings on the monetary costs and benefits that accrue from providing treatment through the major modalities of treatment to alcohol and drug dependent Californians. The objectives of this analysis were to describe:

- dollars spent on treatment,
- economic impacts related to drug and alcohol use before, during, and after treatment,
- economic savings that were related to the provision of treatment, and
- the ratio of benefits to costs of treatment in the major modalities.

The approach we used to assess costs and benefits of treatment is similar to many of the studies that have analyzed the costs of alcohol and drug dependence and the benefits that arise from treating substance abusers. This section describes the approach used for calculating "benefits" of treatment.

"Avoided Costs" Equal Benefits

Calculating "benefits" entails a comparison of the economic impacts of participants before treatment with their impacts during and after treatment. This study applied the standard "cost of illness" methodology to calculate economic impacts of drug and alcohol abuse for the years before and after treatment and the period during treatment. When economic impacts either during or following treatment are lower than the baseline costs, a "benefit" is said to exist. Conversely, when economic impacts during or following treatment are greater than the baseline, benefits take on a negative value.

Our analysis distinguished between how society versus "taxpaying citizens" view economic impacts of drug and alcohol abuse. *Costs to Society* include losses of society's net productivity or losses in society's net wealth. Thus, earnings by abusers of alcohol and drugs in the legitimate economy have a value. In operational terms, the difference between what a person earns and what they could have earned is viewed as a loss to society. Also included are the value of resources used or damaged due to substance abuse such as health, police and corrections costs. However, in the cost to society, the value of stolen goods or cash or the amount of money a person receives as welfare or disability are considered to be "transfers" in that payment moves from one pocket (generally taxpaying citizens) to another pocket in society (in this case substance abusers). There is no net loss when such a transfer occurs. This methodology has been employed in most studies of the impact of substance abuse on society, such as Rice et al (1990) and Harwood et al (1984).

In contrast, a measure termed *Costs to Taxpaying Citizens* includes only those losses to individuals who do not engage in any drug taking or related behavior. For these people, loss of earnings for a drug or alcohol dependent person is of less concern, but the value of theft losses or the amount of money expended on welfare and disability for drug and alcohol dependent persons is viewed as a cost to reckon with. While most substance abusers do pay taxes to some extent, the largest part of the tax bill is born by those that are not substance abusers. In Appendix 3, the components of costs to society and costs to taxpaying citizens, as used in the analysis for the General Report, are defined.

Benefits during the Course of Treatment

This study, like most others, estimated benefits of treatment either during or following treatment by examining changes in impacts from the pretreatment period. Thus, in-treatment benefits were estimated by comparing costs (to society or taxpaying citizens) per day before treatment with the same value during treatment. Total benefits during treatment equaled this value times the duration of treatment in days.

The three major categories of substance abuse-related economic impacts (and benefits) are crime, health, and productivity. This study collected data on participant behaviors during the year prior to treatment, the time when the participant was in treatment, and the time following

treatment to the date of interview. This study has calculated the costs associated with criminal behavior, health care utilization, and labor force productivity by assigning average values to each criminal act, health care utilization, earnings, and welfare/disability received as reported by participants. Appendix 3 displays the components, methods, and CALDATA sources for calculating crime, health care, and lost productivity costs for the treatment population. Appendix 4 describes the two-step process of (1) recoding participant data and (2) determining and applying dollar values to specific variables.

4 Instruments and Field Materials

CALDATA instruments, procedures, and materials were adapted from the methodology of several nation-wide and local drug studies to meet the particular needs and circumstances of CALDATA. Participant listing, sampling and records abstraction materials evolved from the Drug Services Research Survey (DSRS) methodology and from the SROS pretest. The provider questionnaire also began with DSRS and the SROS pretest. Confidentiality materials from the Drug Abuse Treatment Outcomes Studies (DATOS), the National Treatment Improvement Evaluation Study (NTIES), SROS, and the instruments and locating procedures from projects at UCLA's Drug Abuse Research Center, all impacted on the design of the CALDATA participant interview and data collection procedures. The final CALDATA instruments are contained in Supplement 1 to this report. Field manuals, Question-by-Question specifications (Q x Q's) and other field reference materials are contained in Supplement 3.

Provider Questionnaire (PQ)

The Provider Questionnaire (PQ) developed for the SROS pretest, and the evaluation comments from SROS interviewers and providers were reviewed by ADP and the Principal Investigator in September -October, 1992. Modifications were made to existing items, including terminology changes to meet California definitions. The PQ collected data on staffing patterns, staff turnover, staffing costs, space costs and other costs, revenue sources, service charges, and clinical policies, goals and accreditation.

Participant Locating Record (PLR) and Abstraction Record (PAR)

The Participant Locating Record (PLR) was designed to collect complete identifying and locating information for interview reference during the personal interviewing phase. The Participant Abstraction Record (PAR) was used to collect demographic, drug, or alcohol use, and treatment and service information. As with the PQ, evaluation comments from the pretest of the SROS abstraction locating forms, ADP review, and revision by the Principal Investigator were the basis for the final revisions to the SROS instruments, including terminology, to meet CALDATA requirements. The SROS procedures were also refined for California use.

The Discharged Participant Questionnaire

The initial development period for the questionnaire for discharged participants, and for related field procedures, was October - January 1993. A pretest of the instrument and procedures was conducted during January-February 1993 with participants from sampled providers. In all respects, the pretest procedures followed were the same as the specified,

standard field operations, but with the intention of testing the questionnaire's content and improving the administration of the questionnaire. The pretest is described in the following sections: Instrument Development, Issues for the Pretest, Procedures, Results and Recommendations, and Conclusion.

Instrument Development

The interview for discharged participants was structured around sharply defined sections before, during and after a sample treatment, to examine the experience of the participant concerning the following elements, after incorporating design features from SROS, DATOS, and NTIES:

Ethnic and educational background
Drug and alcohol use
Mental and physical health
Illegal activities and criminal status
Living arrangements and family
Employment
Drug and alcohol and mental health treatment

The first seven sections in the questionnaire covered a background period prior to the treatment-related segments and included one section for each element. In addition, each of three time anchored sections contained the same elements. The first time-anchored section, the pre-treatment segment, covered the 12 months prior to the sampled treatment. The second time-anchored section covered the sampled treatment starting with the month of admission and ending with the month of discharge. The last time-anchored section was the 12 months prior to the interview date. To assist the respondent in referring to the time anchored sections in the instrument, the interviewers referred to and recorded key events of the participant's life on a supplementary calendar. The calendar displayed a 6 year monthly calendar and a corresponding time-line representation for 4 variables: the time-anchored segments, previous treatment history, legal status, and other key life events.

Issues for the Pretest

The pretest served to test the supplemental calendar used by interviewers and respondents to reference the specific time segments. A basic issue was to determine how well the calendar was used by the respondent and the level of utility and administrative ease for the interviewer. Calendar segmenting information was to be obtained in advance of the interview, and treatment history and legal status information was obtained from the previous record abstraction and from the respondent at the outset of the interview. The pretest tested the respondents' ability to focus on time segments and keep information within the appropriate time frames. Subquestions included: Are certain types of information more time sensitive for the respondent than others, and are the respondents able to segment information as requested by the interviewers? Are experienced interviewers able to keep the respondents on track through a fairly repetitive

process? If respondents could not keep the time segments distinct, what questions led to difficulties? In addition, the pretest provided more standard information about the questionnaire:
Administration time
Clarity of interviewer instructions
Efficiency of format
Wording of the questions
Adequacy of the response categories
Correctness of reference points and skips
Sensitivity of questions to respondents
Item refusals

Pretest Procedures

Four Field Managers (FM's) conducted each phase of the pretest interview according to the procedures designed for the final survey. They followed the locating and contacting procedures later developed in detail for Phase 2 Administrative Specifications in that they began from the abstracted data in the Participant Locating Record and attempted first contact at the last address and phone given for the respondent in that instrument. Failing successful contact at that address, they next turned to telephone contacts with relatives or friends of the participant listed in the same instrument. Every explanation of the study prior to personal meeting with the respondent was confined to the simple formula about a health care study conducted by NORC for the State of California. As Field Managers, the pretest interviewers were given more discretion about recontact with providers for assistance with locating problem cases, especially the homeless.

Interviews were conducted from a total sample of 32 participants, randomly selected for the pretest from participating providers to represent all sampled modalities. In calling to schedule the interviews and again at the onset of the interview, the interviewing FM explained to the respondent that the interview was for the purpose of determining if the questionnaire is ready for the final data collection. In addition to the $15 incentive mentioned in the letter, the respondent received $10 for a debriefing. The interview was conducted according to all standard procedures, and was timed to record the respondent burden and interviewers' total administration time.

Following the interview, interviewers conducted a debriefing with the respondents to explore any unresolved problems and questions. The pretest interviewers documented the difficult questions and areas of the questionnaire they or the respondents found problematic.

Pretest Results and Recommendations

The collective field results from the pretest are summarized below:

Total pretest sample: 32

Total number located: 17
Total number completed: 9
Disposition of noncompletes:
refusals : 2
not available during pretest period: 6

A telephone debriefing was held February 8th in which the FM's reported the pretest results to Natalie Suter, Kay Malloy, Ellen Williams, and Mary Foote, providing suggestions in three basic areas of data collection:

- training of interviewers and interviewer training manual
- interviewer instructions in the questionnaire
- probes to assist interviewers in eliciting information

From the debriefing the following key issues were identified and resolved:

In locating and contacting the respondents the FM's took great care to only refer to the study as a public health survey. Some felt they needed some additional phrasing that would alert the respondent on phone contact to the importance of privacy for the appointment. In response to this concern, additional wording was suggested for contacting procedures in the administrative specifications about the convenience of having an uninterrupted interview.

In general, the pretest confirmed that a good deal of preliminary time and effort would be required to get each case to the point of interview. Complex locating problems followed by evasion, and broken appointments from a located respondent were common. The procedures spelled out in the Phase 2 specifications are a distillation of the pretest contacting experience.

The last time segment was designed to query the respondent about the 12 months preceding the interview. The Field Managers found that in some cases, there was a problematic lapse in coverage between the end of the sampled treatment segment and the beginning of the last segment. For example, one respondent reported a significant treatment experience between the two designated segments. The Principal Investigator revised the last segment to cover the total elapsed time since the sample treatment discharge.

Preparation of the calendar, particularly outlining the three time segments, was viewed by the FM's as potentially awkward and time-consuming when done as part of the interview. They recommended that the time segments be constructed in advance of the interview, and verified for accuracy with the respondent before the interview started. If the information was not correct, another calendar would be prepared to display the correct time segments. Overall, the pretest demonstrated that the calendar assisted the respondents in reporting information for the time segments. However, it was agreed that the respondents needed an introductory explanation of the calendar and the time-anchored structure of the interview.

Other noteworthy findings from administering the questionnaire:

The respondent burden for the pretest interviews was approximately two hours; certain questions were too long or "wordy". The FM's recommended a reduction in the questionnaire's length. For this population the questionnaire seemed to impose a considerable burden that could potentially result in incomplete, or disrupted interviews. In response to this concern, numerous questions were deleted from the questionnaire, with an estimated 30 minute reduction in the respondent burden.

FM's submitted written lists noting all the structural errors, as question numbers, SKIP patterns, and transition statements, in detailed question-by-question format.

Conclusion

The pretest demonstrated the respondents could focus their responses well within the structured, time-anchored format. The calendar assisted the respondents in framing responses and was administratively feasible for the interviewers. Most importantly, the pretest documented difficulties in advance of the actual data collection, and the protocol and instrumentation were revised to incorporate all recommendations.

Continuing Methadone Questionnaire

The methadone questionnaire was designed to accommodate participants still in treatment. The revisions made for the methadone maintenance instrument address two key differences between continuing methadone and discharged participants:

1) Treatment time would conceivably be much longer and less intensive than the other modalities

2) Current status, while reflecting treatment effects, is not the same as for the post-treatment participants

Segment 2, the treatment segment, therefore was designed to contain a subset of questions exclusive to the longer term participation in methadone maintenance. Segment 3 was adjusted for the long term participant with two time anchors: for treatment less than 18 months the segment covers the entire time since admission to the program, and for treatment 18 months or longer the segment covers the 12 months prior to the interview. In Section A, the calendar construction and verification section, instructions were also modified to set up the time segments for the continuing methadone maintenance treatments of less than 18 months, and those 18 months or longer.

Spanish Translations

NORC's goal in developing a Spanish version of any questionnaire and related respondent materials is to achieve a functional, idiomatic translation of the original instrument, appropriate for people using different dialects of Spanish. The translation methodology which we typically recommend is a committee approach to the translation of questionnaires. Under this arrangement, several translators independently perform direct translations of the existing questionnaire. When the translators are finished, they meet to reconcile discrepancies, and agree upon a version that combines the best of the independent translations. To ensure that the translated version is acceptable to speakers of different dialects of Spanish, the committee includes translators who are native speakers of some of the main dialects of Spanish spoken in the United States.

The strength in this model lies in the fact that consensus among bilinguals is likely to produce more accurate text than the subjective opinion of a single translator. Additionally, by striving for consensus, problems involving personal idiosyncrasies, culture, and uneven skill in either language are overcome.

Typically we also recommend the use of focus groups as a qualitative method of measuring the accuracy of the translation. Focus groups of eight to ten people are carefully selected to participate in a discussion about the questionnaire, led by a trained moderator. The objective is not only to determine which items work and which present problems, but also **why** certain items do not work and what alternatives would work better.

Through focus groups, the effects of a translator's individual idiosyncrasy and subjective distortion are substantially reduced. The generation of a translated text brings together, at each step of this process, the combined efforts of professional translators with the input of the audience for whom the text is intended.

For the translation of CALDATA instruments and relevant respondent materials, we did not conduct focus groups. The CALDATA translation was heavily based on the NTIES translation, for which we conducted focus groups to collect "street terms" for drugs, drug use, and drug paraphernalia, as well colloquial terms for sexual activities. The two focus groups were conducted with recovering Hispanic addicts, with very low income and virtually no education, at two facilities in the Chicago area. Thus, we were comfortable with the knowledge we currently have about the lexicon monolinguals utilized to discuss these topics.

In the modified committee approach used for CALDATA, each questionnaire was divided into three parts. Each part was given to one translator, and the three translators worked on the independent direct translations simultaneously. The first draft of the translation was then circulated so that each translator reviewed the work of the other two. The translators met with NORC's translations' coordinator, Alisú-Schoua Glusberg, to reconcile discrepancies among the

three translations. Additional review was done by Marie Digregorio, a CALDATA field manager, who reviewed the translations for California usage.

5 Data Collection

Confidentiality Clearances And Issues

At the core of the CALDATA study design and implementation is the protection of participants' privacy and sensitivity to the confidential nature of the study. The study protocol was specifically reviewed and approved by the Committee for the Protection of Human Subjects of the California Health and Welfare Agency and the University of Chicago's Institutional Review Board. NORC also received a federal Certificate of Confidentiality from the U.S. Department of Health and Human Services which protected CALDATA interviewers and other research staff from any efforts to compel them to release data collected in the interview or in any procedure leading to or connected with the interview. Certification of the research by the Committee for the Protection of Human Subjects provides additional protection against disclosure.

The interviewer recruitment process involved thorough screening of experienced NORC interviewing staff as well as new candidates for suitability to undertake CALDATA assignments. All prospective CALDATA interviewers for the personal interview phase were asked about their own experience with relevant providers in California. Confidentiality and validity of data were the motivation for this additional screening. It would violate the confidentiality of the respondent and/or the validity of the data if any participant interviews were conducted by interviewers who had been employed by or participated in the services of a relevant provider. For this reason interviewers were excused from any CALDATA assignment in which there was a visible likelihood that any such instance might arise.

Confidentiality was also a focal issue in initial training and in on-going interviewer supervision. Interviewers conducting locating inquiries were trained to discuss nothing more than the general purpose of the inquiry, to satisfy informants that the interviewer had a legitimate motive for seeking the respondent. All preliminary mail, telephone, and personal contacts referred only in general terms to a study being conducted about people's health problems and opinions about the health services received. Only after an interviewer verified that he or she was speaking with a selected participant was the nature of the study described and informed consent obtained before proceeding with the interview. Confidentiality and privacy issues and procedures are detailed in the field manuals, contained in Supplement 3 to this report.

Field Structure and Recruitment

NORC employs an experienced and extensive national field staff. The field structure divides the country into three large districts, further subdivided into nine divisions. Three District Managers provide oversight management in their respective districts; the nine Divisional Field Managers oversee field work in their divisions; and a staff of 50 front-line Field Managers supervise the interviewers. NORC Field Managers constitute a remarkably stable, highly skilled dedicated team with an average of more than 10 years' experience per person. The approximately 1,000 interviewers nationally are all hired, trained, and evaluated by Field Managers or their supervisors.

The field operations for CALDATA were managed by Kathryn Malloy, a Divisional Field Manager based in Pasadena. Malloy was assisted by a site office staff of two clerks, also based in Pasadena. As the CALDATA Project Field Manager, Malloy was further assisted by five Field Managers during each phase of data collection. The Field Managers supervised abstractors and interviewers in specific regions of the state.

Field Structure

Project Field Manager-Kathryn Malloy	
Region 1	Eleanor Palmer, Field Manager Counties Supervised: Los Angeles
Region 2	Marillyn Feldman, Field Manager Counties Supervised: Riverside, San Bernardino, San Diego
Region 3	Norma Smith, Field Manager Counties Supervised: Tehama, Sacramento, Stanislaus, Alameda
Region 4	Maria Digregorio, Field Manager Counties Supervised: San Mateo, San Francisco, Santa Clara, Solano
Region 5	Annemarie Barnhill, Field Manager Phase 1 Dorae Simon, Field Manager Phase 2 Counties Supervised: Orange, Ventura, Fresno, Kern

Interviewer Recruitment

Recruitment for Phase 1 activities started in early September, 1992. During the months of September and October, 55 interviewers were recruited. Additional interviewers were hired for Phase 2 to replace those lost to attrition and to fill out geographical gaps in staffing.

All recruitment began with newspaper ads taken out in the counties where the sampled programs were located. The ads stated that CALDATA was offering part-time work in data abstraction or door-to door interviewing. Like all NORC studies, interviewers were selected on the basis of in-person interviews. The Field Manager met with applicants who passed an initial screening based on phone or letter application. Interviews typically lasted about an hour, and covered such topics as the applicant's educational and employment history, reasons for seeking the interviewing job, and motivation for the job. The Field Manager also went through a mock questionnaire interview with each applicant in which the applicant acted as interviewer. The mock interview allowed applicants to be evaluated on their poise, reading ability, coding skill, and willingness to be trained.

After applicant interviews were concluded, the Field Manager conducted a reference check. The last two employers of each applicant were contacted in order to check the reliability and suitability of the applicant and the validity of their employment history.

CALDATA asked all interviewers staffed for the personal interview phase about their own experience with relevant providers in California. It would violate the confidentiality of the respondent and/or the validity of the data if the CALDATA participants were contacted by interviewers who had been employed by or participated in the services of a relevant provider. NORC has a general rule that interviewers may not begin or complete an interview with anyone who is known to them personally in any context; the general rule worked in tandem with the special CALDATA screening to effectively rule out inappropriate respondent/interviewer matches.

A total of 70 interviewers worked on one or both phases of CALDATA. The nature of the study attracted interviewers of higher than usual levels of education and experience. Forty-two of the interviewers had previously worked for NORC. The statistics below reveal more on the demographic characteristics of the interviewing and field management staff.

Gender: 55 women and 20 men.

Age range: 29 to 74.
Average age: 48.

Average amount of NORC experience: 3 years.
Most experience: 21 years for NORC.

Spanish speaking: 14

Race:

White	53
Black	4
Hispanic	16
Other	2

Education level:

Some High School	1
High School Graduate	9
High School Graduate, Some Vocational	4
Some College	25
College Graduate	28
Some Graduate School	4
Master's Degree	2
Post College Professional Degree	2

Assignments

Phase 1 assignments were generally made based on interviewer proximity to the address of the provider. In a few cases, more experienced interviewers were assigned to providers whose cooperation was difficult to obtain. Each interviewer was assigned to visit one to three providers, depending on the number of programs sampled at a particular provider and on the number of sampled participants anticipated. For four programs with an unusually large number anticipated for the participant sample, a team of two interviewers were assigned to facilitate completion of all listing, sampling and abstraction activities.

Phase 2 interviewing assignments were initially made on the basis of the zipcode of each sampled participant. In some cases when the participant had no address, the zipcode was either

that of a contact person or the provider. Often during Phase 2, the interviewer assigned to a participant was changed when new address information was discovered. Changes in assignment were also made in the following situations: when a more experienced interviewer was needed to convert a refusal; when an interviewer was needed immediately to meet a homeless participant who called the study's 800 number; or when a Spanish-speaking interviewer was needed.

Training

Ellen Williams, a District manager experienced in developing training materials for other drug studies, served in the same capacity on CALDATA, developing field manuals and training protocols. She was assisted by Kevin Jack from the Chicago office, and the field management staff. Specialized materials for sampling, the pretest, and the continuing methadone maintenance questionnaire were developed by Bob Johnson and Mary Foote of the Washington office. Input was also provided by the Principal Investigator, Dean Gerstein, and the Project Director, Natalie Suter.

Training Field Managers for Provider Contact

The five Phase 1 Field Managers were trained in October, 1992 on securing provider cooperation. NORC staff prepared written specifications for first provider contact, emphasizing the protocol for confidentiality. Malloy and Williams conducted a telephone briefing on these specifications with the Field Managers.

Training for Phase 1, Sampling and Abstraction of Provider Records

An in-person training of interviewers was conducted in November, 1992 in Pasadena. Prior to training, a home-study package was mailed to the trainees. The package included self-study exercises to be completed at home and reviewed at the training. The training was conducted in five small groups, each led by one of the Field Managers. NORC staff developed a manual of specifications for sampling and abstracting which served as the focus of the small-group sessions. Each interviewer was given a copy of the manual for use during the training and for reference during the data collection period.

Before the training began, Suter and Malloy met with the Field Managers to review and finalize all training materials and exercises and to address any questions the Field Managers had about the training materials and protocol. Thus prepared, the training was conducted according to the following agenda:

Day 1

Background and Purposes of the Study
Overview of Scheduled Field Tasks in Phase 1
Procedures and Materials for Participant Sample Selection

Confidentiality Guidelines and Protocols
Introduction to Abstraction Instruments: the Participant - Abstraction Record (PAR) and the
Participant Locating Record (PLR) and Abstraction Practice
Introduction to Provider Questionnaire with Practice Mock Interview

Day 2

Practice with Listing and Selecting a Participant Sample
Second Abstraction Practice with PAR and PLR
Practical Problems of Working with Provider Staff and Abstracting from Records
Review of Question by Question Specifications for Instruments
Quality Control: Editing Completed Instruments, Reviewing Sampling Materials for Accuracy
Summary of Procedures; Administrative Issues

Training for the Pretest

Training for the pretest of the Phase 2 participant questionnaire was held on January 22, 1993. Four Field Managers participated in a telephone training which included contributions from Gerstein, Suter, Williams, Malloy and Foote. The following topics were covered:

Overview of instrument and calendar
Techniques for locating and interviewing the participant population
Anticipated pretest issues for resolution or recommendations
Reporting and debriefing requirements
Schedule and administrative items

Site Office Training, Phase 1

Suter and Malloy trained the site office clerks on the following: the proper way to represent the study over the phone; Quality Control procedures; systems for managing receipt of sampling data and completed abstraction instruments.

Training for Sample Trims

As Phase 1 sampling progressed, it became clear that the samples designed for many programs needed adjustment because of discrepancies between program records and data in the CADDS system. Johnson devised a telephone training agenda that was used to instruct interviewers about changes in sampling rules when this problem was encountered.

Training for Phase 2, Participant Interviewing

An in-person training of interviewers was conducted in March, 1993 in Pasadena. Prior to training, a home-study package was mailed to the trainees. The package included self-study exercises to be completed at home and reviewed at training. The training was conducted in five small groups, each led by one of the Field Managers. An Interviewer Manual was written to guide the training and for interviewer reference during Phase 2 data collection.

The training was conducted according to the following agenda:

Day 1

Research Objectives of the Study
Contacting Participants in Recovery for Outcome Interviews
Confidentiality Guidelines
Conducting the Participant Interview: Demonstration
Training Practice with Scripted Participant Mock Interview

Day 2

Continued Practice with Scripted Participant Mock Interview
Contacting and Locating Respondents
Special Problems of Drug Outcome Interviewing

Day 3

Final Practice Scripted Mock Interview
Gaining Cooperation of Respondents
Special Circumstances
Working with Assignment Documents, Logs, Reporting
Administrative Issues
Distribution of Interviewer Assignment Materials

A final scripted mock interview to be conducted by trainees over the telephone with their Field Managers completed the training plan.

Prior to the interviewer training, Suter, Malloy, and Williams, met with the Field Managers to review specifications, the training agenda, and mock interviews, to equip the Field Managers to act as trainers for small group sessions. At a plenary session, Gerstein and Suter explained the research objectives and the data collection plan while guest speakers from UCLA and Rand gave background on similar research with populations of participants in recovery. The balance of the three day training sessions were conducted by the Field Managers meeting with interviewers in small groups.

Early in May, the March training was repeated for a second group of interviewers. This group had been recruited to cover geographical needs and replace losses due to attrition.

Site Office Training, Phase 2

Suter finalized site office procedures for Phase 2 in March and conducted a training session with Malloy and site office staff early in April, 1993.

Methadone Questionnaire Training

Field Managers attended a special training on the modified questionnaire designed for participants in continuing methadone maintenance programs the first week in May, 1993. A self study package was prepared for the interviewers, followed by a phone review and completion of a mock interview conducted over the phone by field managers.

Validators' Training

Additional specifications were developed to acquaint Field Managers assigned to telephone validation of completed Participant Interviews with the background of the study and, especially, with the stringent confidentiality guidelines that controlled contact with respondents and with locating informants. In June, 1993, Jack and Williams conducted a telephone briefing based on the Validation Specifications with the Field Managers assigned to the validation task.

Spanish Interview Training

In July, Digregorio conducted a telephone review of the Spanish version of the participant questionnaires with the interviewers assigned to conduct interviews in Spanish.

Recruiting Providers and Programs

The objective of Phase 1 of CALDATA was to gather provider level data from a selected sample of California programs, list participants to select a sample for follow-up, and abstract their records.

Early in Phase 1, ADP sent a letter to County Executives introducing the study.

Program contacts began with an introductory letter to the providers involved, also sent by ADP. Shortly after the letters were mailed, the Field Managers made a follow-up phone call to each provider. If hesitation about cooperating with CALDATA was expressed, Field Managers assessed whether the programs lacked information about the sponsorship and objectives of the study. On many occasions, the providers did not recall receiving the letter and another mailing was requested from ADP by the Field Manager. Once a provider received the letter, and appeared to understand the nature and purpose of the study, the Field Manager

minimized time spent in general discussion and explanation and proceeded immediately to scheduling the abstraction visit.

Some providers appeared to understand and accept the study as useful and legitimate, but still seemed reluctant to cooperate. Such providers often had other concerns about the study, which the Field Managers then addressed. As Phase 1 progressed, County Executives and provider organizations raised similar concerns. Most concerns dealt with the burden of participation on staff time and with how confidentiality would be protected. A special informational packet was prepared for County Executives and providers to address these concerns. The Principal Investigator also made a presentation about the study early in January, 1993.

Final Program Participation

Listing and sampling activities were completed for 87 programs between November 1992 and May 1993. Four programs were ruled ineligible and 19 others refused participation.
The cooperating programs and their sampled participant totals, by modality, were as follows:

Modality 1: Social Model Recovery
21 programs, 703 participants

Modality 2: Methadone Detox
13 programs, 506 participants (Phase I)
12 programs, 474 participants (Phase II; one program did not agree to participant contact)

Modality 3: Nonmethadone Outpatient
23 programs, 641 participants

Modality 4: Residential
18 programs, 615 participants

Modality 5: Methadone Maintenance Outpatient and Continuing Methadone Supplemental Sample
12 programs, 302 discharge sample participants, 310 supplemental sample participants

The following tables illustrate more detailed characteristics of the cooperating programs, ineligibles, and refusals.

Table 1: Cooperating Programs, by Modality and Region

	PROGRAM MODALITY					
REGION	1	2	3	4	5	TOTALS
1	5	5	3	4	4	21
2	6	0	4	2	2	14
3	4	2	3	2	2	13
4	1	2	6	7	1	17
5	5	4	7	3	3	22
TOTALS	21	13	23	18	12	87

Table 2: Length of Time to Secure Program Cooperation, By Modality

	TIME				
MOD.	up to two weeks	more than two weeks and up to one month	more than one and up to two months	more than two and up to four months	greater than four months
1	14	3	2	2	0
2	7	1	0	2	3
3	6	9	3	4	1
4	7	5	2	3	1
5	4	4	1	1	2
TOTAL	38	22	8	12	7

Table 3: Length of Time From First Telephone Call to Completion of All Listing, Sampling and Abstracting Activities, By Modality

MOD.	up to one month	more than one and up to two months	more than two and up to three months	more than three and up to four months	greater than four months
1	6	10	4	0	1
2	2	5	2	1	3
3	5	9	7	1	1
4	2	11	3	1	1
5	1	5	1	3	2
TOTALS	16	40	17	6	8

Table 4: Ineligible Programs

Region 2, Modality 3: Dropped from sample because it was an all residential facility.
Region 4, Modality 3: Program received no state funding, no longer reported to CADDS, and does not provide treatment.
Region 3, Modality 4: Program provided education, not treatment.
Region 3, Modality 4: Program did not provide residential care, although it was sampled as a residential care provider.

Table 5: Program Refusals, By Modality and Region:

	PROGRAM MODALITY					
REGION	1	2	3	4	5	TOTALS
1	1	2	0	0	2	5
2	0	3	0	0	2	5
3	1	0	0	1	0	2
4	0	1	2	0	2	5
5	0	0	2	0	0	2
TOTALS	2	6	4	1	6	19

Almost half of the refusals were from one provider chain, with final reasons for refusal not known. Confidentiality concerns, including the possibility of legal action by participants against providers and time and schedule constraints, were the main reasons for refusal in most cases. At one program, completed abstracts were not released. Another program completed all Phase 1 activities, but would not agree to participants being interviewed.

Recruiting Participants

From the earliest stages of CALDATA planning, nonresponse was recognized as a potentially important problem. In this section, we describe how particular design features and field operations contributed to increasing the response rate. We especially focus on the uses of administrative records from sample providers and from the State of California in locating sample patients. We conclude: 1) that provider cooperation rates might be improved by a more tailored approach to gaining the cooperation of large provider chains; and 2) that patient response rates might be improved by making earlier use of locating information from administrative data systems such as motor vehicle, medical eligibility, and credit bureau records.

A total of 1821 non-trim interviews were completed. (We note that a small number of cases were completed that had been effectively trimmed from the sample during the sample reduction process resulting from CADDS discrepancies; these cases are not considered part of the base sample for Phase 2, however.) Participants interviewed in person signed a consent form; attestation statements were signed by the interviewers for participants interviewed by phone. Overall completion rate is 61.4%, counting deceased participants as out-of-scope. 592 participants (19.9%) could not be located, 231 refused (7.8%), and 185 (6.2%) were classified

as "Other NIR," which includes the participants who were found through the Medi-Cal address check. Final distribution of the Phase 2 sample, by modality type, is shown in Tables 6-10 for non-interviews (NIR), out-of-scope cases (OOS), and completes. Definitions for the case dispositions reflected in the tables are as follows:

OOS= Ineligible participants; includes deceased, language problems, incapacitated

Completes

CC-Part=	Partial interview
CC-Pers=	In-person interview
CC-Phn=	Telephone interview
Span-Pers=	In-Person Spanish interview
Span-Phn=	Telephone Interview in Spanish
Conv-Pers=	Converted refusal in-person
Conv-Phn=	Converted refusal by telephone

Non-Interviews

CA Jail=	In California Jail
CA Trtmt=	In California Treatment Facility
Other State Jail=	In jail in other state
Other State Trmt=	In treatment in other state
Undoc=	Could not be located
Ref/Confident=	Refusal because of confidentiality concerns
Ref/other=	Refusal for other reasons
Other Out-of-State=	Located out of state but could not be reached by phone to arrange for an interview
Appt not kept=	Interview appointment not kept by participant
Other NIR=	Located through the Medi-Cal address check too late to be interviewed

TABLE 6: OVERALL COUNTS, BY MODALITY						
TYPE	**ORIG**	**OOS**	**CURR SAMPLE**	**COMPLETE**	**NIR**	**COMPLETION RATE**
1	703	9	694	401	293	57.8 %
2	474	24	450	294	156	65.3 %
3	641	11	630	382	248	60.6 %
4	615	15	600	343	257	57.2 %
5	302	13	289	182	107	63.0 %
5CM	310	5	305	219	86	71.8 %
TOTAL	3045	77	2968	1821	1147	61.4 %

TABLE 7: COMPLETE COUNTS, BY MODALITY							
TYPE	CC-Part.	CC-Pers.	CC-Phn.	Span-Pers.	Span-Phn.	Conv-Pers.	Conv-Phn.
1	5	359	36	0	0	1	0
2	3	278	10	0	1	2	0
3	1	345	23	4	0	7	2
4	2	311	29	1	0	0	0
5	3	169	10	0	0	0	0
5 CM	0	205	11	0	0	3	0
TOTAL	14	1667	119	5	1	13	2

TABLE 8: MONTH COMPLETED, BY DISPOSITION							
MONTH	CC-Part.	CC-Pers.	CC-Phn.	Span-Pers.	Span-Phn.	Conv-Pers.	Conv-Phn.
April	1	174	0	0	0	0	0
May	2	304	1	0	0	0	0
June	7	244	24	0	0	0	0
July	0	203	1	0	0	0	0
Aug.	1	252	15	1	0	0	0
Sept.	1	220	24	1	1	8	2
Oct.	1	105	13	3	0	3	0
Nov.	0	148	12	0	0	2	0
Dec.	1	17	9	0	0	0	0
Jan.	0	0	20	0	0	0	0
TOTAL	14	1667	119	5	1	13	2

TABLE 9: OUT-OF-SCOPE, BY MODALITY				
TYPE	Deceased	Language	Incapacitated	Other
1	7	0	2	0
2	14	7	1	2
3	8	0	2	1
4	12	1	2	0
5	13	0	0	0
5 CM	3	0	1	1
TOTAL	57	8	8	4

TABLE 10: OTHER NON-INTERVIEWS, BY MODALITY					
TYPE	CA Jail	CA Trtmt	Other State Jail	Other State Trtmt	Unloc
1	2	0	0	0	178
2	0	2	1	0	87
3	1	0	1	0	105
4	0	3	2	1	146
5	2	1	0	0	47
5 CM	0	1	0	0	29
TOTAL	5	7	4	1	592

TABLE 10 (CONT.): OTHER NON-INTERVIEWS, BY MODALITY					
TYPE	Ref/Confid	Ref/Othr	Other Out-of-State	Appt Not Kept	Other NIR
1	5	39	21	5	43
2	5	24	8	3	26
3	10	61	14	21	35
4	7	23	18	9	48
5	4	18	9	4	22
5 CM	6	29	0	10	11
TOTAL	37	194	70	52	185

Final distribution by region is shown in Tables 11-14 below, for all cases in the Phase 2 sample.

TABLE 11: OVERALL COUNTS, BY REGION

REGION	ORIG	OOS	CURR SAMPL	COMP	NIR	COMPL RATE
1: Los Angeles	770	17	753	406	347	53.9 %
2: Riverside/San Bernardino/ San Diego	502	12	490	330	160	67.3 %
3: Tehama/Sacramento/ Stanislaus	582	13	569	363	206	63.8 %
4: San Mateo/San Francisco/ Santa Clara/Solano	410	11	399	202	197	50.6 %
5: Orange/Ventura/Fresno/ Kern/Alameda	781	24	757	520	237	68.7 %
TOTAL	3045	77	2968	1821	1147	61.4 %

TABLE 12: COMPLETE COUNTS, BY REGION

REGION	CC-Part.	CC-Pers.	CC-Phn.	Span-Pers.	Span-Phn.	Conv-Pers.	Conv-Phn.
1	4	386	13	0	1	2	0
2	0	290	38	0	0	2	0
3	8	340	15	0	0	0	0
4	1	185	15	1	0	0	0
5	1	466	38	4	0	9	2
TOTAL	14	1667	119	5	1	13	2

TABLE 13: OUT-OF-SCOPE, BY REGION				
REGION	Deceased	Language	Incapacitated	Other
1	15	0	1	1
2	9	0	3	0
3	5	6	0	2
4	10	0	1	0
5	18	2	3	1
TOTAL	57	8	8	4

TABLE 14: OTHER NON-INTERVIEWS BY REGION					
REGION	CA Jail	CA Trtmt	Other St Jail	Other St Trtmt	Unloc
1	2	5	2	1	199
2	3	1	1	0	87
3	0	0	0	0	85
4	0	1	1	0	109
5	0	0	0	0	112
TOTAL	5	7	4	1	592

TABLE 14 (CONT.): OTHER NON-INTERVIEWS BY REGION					
REGION	Ref/Confid	Ref/Othr	Other Out-of-State	Appt Not Kept	Other NIR
1	12	52	23	14	37
2	5	28	14	0	21
3	5	36	9	10	61
4	6	29	11	23	17
5	9	49	13	5	49
TOTAL	37	194	70	52	185

Locating Participants

Locating difficulties had two main causes: 1) deficiencies in the locating information obtained from providers and 2) mobile and elusive lifestyles of some participants. Some programs were able to supply only minimal or inaccurate locating information, and most supplied too little information for locating homeless or transient participants. We found that names, addresses, and phone numbers of relatives had limited value in contacting sample participants who rarely contacted their families. It turned out that many had given fictitious names, birth dates, and social security numbers at the time they entered treatment.

The breakdown of initial address information and number of completed cases by modality type, is shown below in Table 15.

TABLE 15: INITIAL LOCATING INFORMATION AND COMPLETED CASES, BY MODALITY

MODALITY	PARTICIPANT ADDRESS		CONTACT ADDRESS		PROVIDER ADDRESS ONLY	
	COMPL	TOTAL	COMP	TOTAL	COMPL	TOTAL
1	284	465	85	172	32	66
2	281	455	13	17	0	2
3	372	620	7	13	3	8
4	318	546	13	27	12	42
5	175	286	6	15	1	1
5 CM	208	290	10	18	1	2
TOTAL	1638	2662	134	262	49	121
COMPLETION RATE	**61.5%**		**51.1%**		**40.5%**	

Operational Problems in locating CALDATA Participants

Phase 2 interviewers began the search for respondents with information available from the PLR (Participant Locating Record) completed during the Phase 1 abstraction. During that abstraction we were told by many programs we would not be able to locate the homeless/transient participants, but CALDATA interviewers did find a reasonable number of them. Persistence by the field staff was the key to locating and completing 60% of the cases assigned. The interviewers used all of the avenues open to them and were inventive about developing locating procedures, like "hanging out" at homeless centers and drug-dealing areas in metropolitan cities.

Many general locating resources were consulted by the project management to back up local inquiries by CALDATA interviewers. These included checks of voters registration, credit bureau checks, jail lists from Los Angeles county each week, the prison locator in Sacramento, vital statistic records, Veterans Administration, death registry checks, directory assistance, post-cards and letters posted at homeless shelters and at the providers, contacts with directors of homeless shelters, Department of Motor Vehicles (DMV) records and Medi-Cal records check.

At least 10% of CALDATA participants were incarcerated. Early in the field period Robert Dickover, Chief Of Research and Chief Deputy Director R. H. Denninger, of the California Department of Corrections, reviewed and approved the study. A memo granting approval for the study from Chief Denninger allowed access to all state Department of Corrections Institutions. The Principal Investigator obtained authorization to conduct interviews in the Federal Bureau of Prisons, but, because of the stipulation that all interviews be done in person, we were able to interview only 5 of the 10 participants who were federal prison inmates. We found that many prisoners are moved frequently and tracking them was a time consuming effort. We also found that many participants are lost in the prison system, and, near the end of the study, that many of our difficult to locate participants had been incarcerated the entire field period. Due to being in the process of transferring to different facilities or being in a holding status in prison, we missed finding them. Probation records were not available to us and we feel that in the next study of this nature, it would be important to get approval for access to probation records as well.

Most prison authorities accommodated our requests to interview participants, but the process was again time consuming. We started with a request to interview the prisoner. This was done by writing a letter to the prison warden with the name and prison ID number of our participant. The letter stated that the study had been reviewed and approved by Chief Deputy Director Denninger. The next step was a call from the Field Manager to set up a time and date for the interview. We usually faxed a copy of the approval letter to the warden.

We could have attained a better completion rate with earlier access to the Department of Motor Vehicles and the Medi-Cal eligibility MEDS files. Thirty percent of the 632 names of unlocated respondents submitted late in the field period for California Medi-Cal address checks matched to names and addresses in MEDS files. Since the agency could not release address information to us, they mailed post cards to the participants asking them to call the 800 number. As a result 18 interviews were completed. Calls continued to come into the 800 number after the study was out of the field.

The DMV ran almost 1200 names through their system. The result was hard to measure since the DMV reports duplicated many addresses from the provider records that we had already contacted in our own locating effort in the field before the participant list went to DMV. The cost per completed case would have been less if we had been able to use the resources of the MEDS files and DMV much earlier in the field period. Early access to both DMV and MEDS addresses would greatly enhance our completion rate as well as keep costs at a reasonable level. More attention should be focused on all resource aids prior to fielding a project of this nature.

Late in the field period we gained access to the state death registry. Over 800 names went through the system. No deceased participants were found from that source, explained by the

fact that we had already determined the deceased participants in our sample by contacting next of kin or by the use of the county vital statistics records. County records were searched for marriage, death, and births for each county we worked. Voter's registration was a useful source of locating in some areas. The post office was used for tracking participants who had moved. Change of address was requested from the post office for the last known address.

Calls to the 800 Number

A toll-free number was set up for CALDATA before the beginning of Phase 1. The 800 number was intended to facilitate the progress of both phases of the study. The number was printed on all introductory letters and follow-up postcards mailed to providers, participants and participant contacts. The number also appeared on business cards given to the Phase 2 interviewers, who distributed the cards among people who might help them find sampled participants.

During Phase 1, providers frequently called the 800 number when they had questions about the purpose of the study or their involvement in the abstracting at their facility. County Administrators called when they heard about the study from providers in their region. They usually had questions about confidentiality issues as well as the purpose of the study. Many wanted more information about the study.

During Phase 2, the 800 number proved to be a most useful tool for locating. The letters and post-cards generated more than 800 calls to the 800 number. Calls came from the participants themselves, as well as from the friends, spouses, and other relatives of the participants. Most callers wanted to learn more about the study or let us know the whereabouts of the participant. Some calls were refusals to participate, from either the participant or a proxy. Confidentiality was also a prominent concern for many calls to the 800 number.

Appointments were often set or rescheduled by use of the 800 number. When a participant called and agreed to be interviewed, the site office clerk took down locating information from the participant and forwarded the information to the Field Manager for that area. The Field Manager then passed the information on to the interviewer assigned the case, who contacted the participant to arrange a time and place to meet.

Importantly, the 800 number was also used to arrange appointments for homeless participants. Homeless participants often called and asked that an interviewer meet them at a certain street corner at a certain time to complete the interview.

Participant Refusals and Other Non-Response

- ***Final Refusal, confidentiality concerns*** The more detailed reasons for these refusals varied widely. The most frequently cited reason was concern over how NORC got the respondent's name and locating information. The respondents expressing this concern sometimes mentioned only NORC, but many went further and questioned why their provider had given their name. The only other reason mentioned more than once was the suspicion that the interview was really

a ruse being run by some group the respondent was avoiding, such as federal marshals or a collection agency.

A few respondents described specific situations which made them reluctant to discuss their former drug use and treatment. One respondent was living with her in-laws and did not want to risk their finding out about her past. Another respondent was a juvenile whose parents had spent considerable money on legal fees to erase some drug-related convictions from his record. They therefore instructed their child to refuse as a protection of their investment. Finally, one respondent was involved in a pending lawsuit and did not want to risk that his drug use would come up in the trial.

A few respondents cited reasons connected with the introductory information given to all respondents. One balked specifically because she found misleading the references to the survey as a "health study" in the participant letter. Another refused due to the repeated references to potential "injury to you" in the Consent To Be A Research Participant form.

- ***Other Final Refusal*** A large percentage of respondents who refused declined to explain their reasons for refusing. This occurred despite the fact that interviewers routinely probe for an explanation as a conversion tool. Notably, several respondents refused so adamantly that the interviewer could not respond with probing.

Of those respondents who offered an explanation for their refusal, two reasons were given most often: the respondent was too busy or was just not interested in participating. Several participants simply did not want to dredge up memories of their troubled pasts. Several others were annoyed by our ability to track them down, especially if they had recently moved, or had made efforts to protect themselves from unsolicited attention.

Reasons cited by only a few participants included hostility toward the state government, a general policy against doing surveys, and being too old to participate.

A significant number of the refusals came not from the actual respondent, but from a proxy speaking for the respondent. Proxy refusals followed the same reasons given by the respondents themselves, with the addition of the hidden refusal technique of denying that the respondent was available.

- ***Permanently incapacitated participants (out of scope)*** The number of permanently incapacitated respondents was small. Most of these respondents suffered from physical conditions so severe that they were unable to speak at all or for more than a few minutes at a time. Examples include loss of speech from a stroke, brain damage from a car accident, recent brain surgery, and a respondent who was comatose after suffering a drunken fall. One respondent, however, suffered from hallucinations and hearing voices.

Improving Provider and Participant Response Rates

Future planning of surveys of drug treatment patients might benefit from the lessons of CALDATA. We think provider cooperation rates might be increased through a more strategic and tailored approach toward gaining the cooperation of large provider chains. Provider response rates could also have been improved by:

1. Earlier dissemination of general information about the study to appropriate groups, associations, newsletters, etc.

2. Securing support of appropriate County Executives, and providing them with materials to answer questions and concerns.

3. Securing endorsement and/or letters of support from provider associations.

4. Attending meetings of County Executives, and provider groups prior to the data collection effort.

5. Developing an optimal initial provider contact package to include letters of support or recognition, and a fact sheet about findings of related studies and goals of the current study.

Some of the following steps might help increase participant response rates:

1. Selection of sample programs at an early enough point in time to allow solicitation of provider assistance in tracking recently discharged participants and encouraging them to respond. For example, sample programs might be willing to inform participants about the study or to obtain address update cards from participants at the time of discharge. Field staff could visit providers quarterly to sample discharges, abstract record and locating information, and collect update cards at that time for the sampled participants.

2. Authorization to access probation records as well as prison and jail lists.

3. Earlier access to DMV records and Medi-Cal eligibility files, and more frequent review of these records as they are updated during the field period.

Prospective designs might have advantages in increasing both program and participant response rates. If the participant sample were selected from in-treatment lists on a flow basis, locating information and pledges of cooperation could be obtained at the time of selection into the sample. Project staff could also be assigned to work with program staff to inform and encourage cooperation from prospective sample members during rather than after the eligibility period of the study. Yet the potential benefits of prospective surveys in increasing response must be balanced against the shorter time requirements and possibly lower costs of retrospective surveys.

Interviewer Performance Evaluations

During Phase 1, all abstraction documents received at the site office were reviewed thoroughly. Sampling forms and rosters were carefully edited for completeness and accuracy of sampling procedures. PLR's and PAR's also received careful edits. At least three site visits were made by the Field Managers during abstraction to assure that the sampling and abstraction was being completed correctly. During the first weeks of Phase 2, each interviewer sent his or her first two completed cases to the Field Manager instead of to the site office. The Field Manager edited each of these first completes and gave feedback to the interviewers on any problems found in coding, documentation, use of calendar, etc. The Field Manager edited additional cases periodically during the field period.

As Phase 2 continued, interviewer validation was launched. The validation effort was handled in waves. The first wave began in June, 1993, when a computer generated list consisting of a random 10% of completed cases was selected for each of the interviewers. Another wave of cases was selected in August, 1993. This wave captured validation on the more recent interviews. Near the end of the data collection effort, other cases were designated for validation to assure that each interviewer had 10% of their cases validated. Validation was conducted by Field Managers not assigned to CALDATA to ensure objectivity in the interview validation process.

During the first wave of validation, some of the cases belonging to one interviewer did not pass the validation criteria and it was determined that all cases completed by this interviewer would need to be checked. Due to the nature of the population of the study, with a large number of homeless and/or transient respondents, it was impossible for the validators to establish phone contact with every respondent for interviews reported complete by this interviewer. Field management chose other interviewers to try in-person validation of the cases involved. These interviewers were instructed to complete replacement interviews for cases which did not pass the in-person validation. The non-validating interviewer had completed 73 cases of which 23 passed phone validation. Of the 52 which did not, 12 satisfied an in-person validation and passed, and 20 were re-interviewed leaving 19 who refused or were unable to be located to complete another interview. The data for these cases was removed from the study's data files and the final case dispositions are either "final refusals" or "final unlocatable."

Excluding the non-validating interviewer cases, 508 cases were selected as candidates for validation. Of those 508, 346 passed validation, for a total of 19% completed validations overall. For the remaining cases, the validators were unable to contact the respondent directly by phone. In those cases, either the respondent did not have a phone (or an address), or the phone had been disconnected.

Production and Cost Reports

Reporting during Phase 1 was done through Plan Perfect reports. The Field Managers sent a Plan Perfect report each week listing the number of abstractions completed along with hours worked and expenses for each abstractor. These reports were combined to form a total state

report each week. The Field Manager hours and expenses were reported in the same manner in a separate report.

A summary report was also prepared for the management staff in Washington and Chicago each week which listed by region the total number of programs, totals for ineligible, complete and refusing programs, total numbers of appointments and programs not yet scheduled, and total number of participants sampled.

Phase 2 used three types of reports. The Field Managers prepared a Plan Perfect report each week listing hours, completed cases, expenses, and numbers of appointments for each interviewer. Quattro Pro reports were also used. Each week, these reports totaled interviewer hours, the number of completed cases, expenses for each interviewer, and the amount of money left for each region. NORC's Field Management System (FMS) was used to track the progress of each case from pending status to final case disposition. The FMS was also used to collect per case costs and cumulative costs for individual interviewers and for each region. (The FMS is described more fully in the next chapter).

NORC's Survey Management System (SMS) was the principal case management and interview assignment tool for both phases of CALDATA, and was the mechanism for assigning programs a final complete status in Phase I, based on receipt of all required program documents, and assigning participants a final complete status in Phase 2, based on receipt of all required documents for each participant interview. In addition, identifying information about each program, including address, was entered into the SMS, along with name and address information for each sampled participant. This was the basis for making interviewing assignments on CALDATA, discussed further in the next chapter. SMS reports were generated periodically to reconcile receipted cases counts and dispositions with counts and dispositions reported prior to receipt through the FMS.

6 Systems, Data Processing, and File Preparation

Systems

The Technical Infrastructure

Much of NORC's information processing is PC-based. The NORC wide area network (WAN) consists of more than 25 file servers linking almost 600 PC workstations in NORC's three Chicago locations and an extensive remote data communications structure including offices in Washington, D.C., New York and Field Managers throughout the United States. Overall, the WAN offers its users over 8 gigabytes of online disk storage, 3 nine-track tape drives, CD-ROM readers, and 15 high-volume laser printers. Some servers are dedicated to survey production activities, such as computer-assisted data entry (CADE). Others are used by researchers to analyze datasets or write reports or by survey managers for a variety of management-related tasks.

NORC also uses UNIX-based computing services offered by the Social Science and Public Policy Computing Center (SPC^2). Jointly sponsored by NORC, the university's Social Science Division, and the Harris Graduate School of Public Policy Studies, SPC^2 operates a campus-wide network of UNIX hosts and high performance workstations. A new but already very successful facility, the SPC^2 is primarily directed at the information-processing needs of academic researchers, although some NORC survey work also uses the system.

Software Systems Overview

NORC's extensive array of software systems may be grouped into four broad categories: survey production systems, research and analysis tools, administrative and financial systems, and office automation tools.

The survey production systems support the key activities of data capture and survey information management. For data capture NORC uses AutoQuest, a full-feature, state-of-the-art, commercially available system. NORC staff members use the powerful and efficient questionnaire specification language to set up questionnaires in the data capture system. This system is used to perform various levels of computer-assisted data entry (CADE). All information about the questionnaire is stored in a database that also is used to generate control statements for both SAS and full data file documentation.

The Survey Management System (SMS) is the principal management tool on most surveys. At the beginning of the survey, the survey's sample file is used to create the basic SMS database. Throughout the survey, the SMS tracks all events associated with a particular case, including activities such as a successful interview, receipt of an instrument in-house, completion of data entry, and other events of interest to survey management. The SMS also notes the date of the event and the relevant actor. Actors can include interviewer, coders, data entry personnel, and others. Updates to the database can be done manually by in-house staff or

automatically by other systems. Reports on the SMS database inform the project director about overall survey progress as well as the status of individual cases. Reports can also be used to measure staff productivity.

NORC's Field Management System (FMS) was developed to provide survey managers with timely data on costs and production on field surveys. The system runs on a wide area network consisting of the NORC WAN as a host and a varying number of field stations connected over conventional telephone lines. Like the SMS, the FMS is case based. At the beginning of the field period all cases assigned to particular Field Managers are downloaded to the individual's PC. Field Managers use the system to make assignments to interviewers and to track the progress of each case in the field. In a weekly conference call with each interviewer, Field Managers also collect information on costs being incurred by individual interviewers. On a regular basis--usually weekly--Field Managers electronically transmit data from their distributed databases to the NORC central office, where they are merged into a single, project-wide database. Reports on this database keep the central office survey staff apprised of the pace of production and current costs of the field effort.

NORC researchers have access to analytical software on all computing platforms. The three most commonly used are SAS, SPSS-X, and STATA. These are supplemented by a large number of other, more narrowly focused software packages such as CTM, HLM, HOTZTRAN, and GAUSS.

Finally, the NORC WAN offers a full array of software tools befitting an organization where computer use is universal. NORC staff members make extensive use of the cc:Mail system that connects not only all staff in the Chicago offices but Field Managers and staff in the Washington and New York offices as well. In addition most clients use the system as a means of rapid communication and document exchange with NORC staff. Other software packages in common use include WordPerfect, Quattro Pro, Harvard Graphics, Lotus 1-2-3, Reflex, Paradox, dBase III, Symphony, Carbon Copy, and Crosstalk. The End User Support Group maintains these user-oriented software systems and trains NORC staff in their use.

Survey Management System (SMS) Setup For CALDATA

The single user SMS for CALDATA maintained two data files, one for the program-level records and another for the participant-level records.

The NORC SMS case ID for the participant-level records was the four digit program ID plus two digits added to the end that ranged from 01 through 50. When necessary, that number was increased to allow for a maximum of 99 participants per program.

The CADDS ID was retained in the file to provide a link back to the original CADDS data.

The first function of the SMS was to allow entry of participant name and locating information when information was received at the site office after all listing, sampling, and abstracting activities had been completed for a cooperating program. The site clerk entered the

program case ID being receipted once. Then for each Participant Locating Record (PLR), the clerk entered the two digits from the participant case ID on the pre-labeled PLR to call up the case record for updating. Programs for reports were written to ignore any empty, or unused, participant file records.

The SMS was also used for making assignments, generating all assignment materials (such as face sheets with program information for Phase 1 and with participant information for Phase 2, assignment logs, and questionnaire and mailing labels), receipting cases in Phase 2, and reconciliation with the FMS.

The single user nature of this system eliminated the need for file locking, special report processing, nightly maintenance, and some security measures. The hardware was pre-loaded and all SMS software, report procedures, remote access, maintenance jobs and printing capabilities were tested in Chicago prior to being shipped to California.

The data files were transferred to Chicago on a regular schedule over the phone lines. CALDATA was given an account on the NORC internal electronic mail system and site office staff were trained on how to use it to send files and documents. A schedule was maintained that allowed for several hours at least one night a week to be reserved for the programmer in Chicago to have exclusive access to the system. A parallel system was maintained in Chicago to allow NORC users access to the most recently transferred data and for any necessary software modifications to be applied and tested an NORC prior to being transferred to the California system. The two main SMS screens are described on the following pages.

---------- PARTICIPANT INFORMATION SCREEN ----------

Current Disp: case ID: Link ID:

Participant Information - Participant Region:_____
Interviewer:_____

Name:_____
Address:_____
City:_____ State:_____ ZipCode:_____
Phone: (___)____-_____

Alt. Name:_____ Relation:_____

Cause of Death_____

Provider Information -- Provider's SMS ID:

CADDS ID: NIDA ID:
Provider Name:
Region: County:

This screen was used to enter or change participant information. Items such as address, phone, cause of death, field interviewer ID, and region that the participant was located in were entered. The ALT.NAME and RELATION fields were used when there was no address for the participant to enter the name of the person that the address information applied to and the relation of that person to the participant. The provider information on this screen was not updatable.

Another function of this screen was to activate the case. The SMS was set up with blank records that had a disposition of 00. Once information was entered through this screen the disposition was automatically updated to 01 to show an active case with pending status.

---------- PARTICIPANT DISPOSITION UPDATE SCREEN ----------
-

Participant CASEID :
Name :
Addrs:
City : State: Zipcode:

Region: FI ID: Mode/Type:
Provider Name:

Case Disposition: ___ Date of last Disposition Change:
NIR Date: _____ LINK ID: _____

VALID CODES

Pending Codes:	Complete Codes:	Out-Of-Scope/NIR Codes:
01-Not Mailed	60-Partial Complete	82-Deceased
02-Mailed No Action	61-Complete (In Person)	86-Language barrier
90-IN CA. PRISON	62-Complete (By Phone)	87-Permanently Incapacitated
91-IN TREATMENT CNT	63-Spanish (In Person)	89-Other Out-Of-Scope
93-OUT-OF-ST.TRMNT CTR	64-Spanish (By Phone)	94-Final Unlocatable
97-OTHER OUT-OF-ST.	65-Converted (In Person)	95-Final Refusal
98-APPT. NOT KEPT	66-Converted (By Phone)	99-Other Final NIR

This screen was used to update the participant interview disposition code. Other dispositions were programmed after a review of individual participant reasons for non-response, and are reflected in the tables contained in Chapter 5.

The NIR Date field was used on this screen to enter the date that the participant qualified for NIR status, such as date of death. The LINK ID was used to show that this participant was also included in the sample by being selected through another provider location. The case id of the second record for the participant was entered under LINK ID.

Other screens allowed the site clerks and project management staff to view participant information and to review the status of a case at various points in the study.

Field Management System (FMS) for CALDATA

The specifications for setting up the CALDATA FMS are contained in Supplement 3. At the beginning of Phase 2, the cases in the participant sample in the SMS were downloaded to Field Manager's PC's for the cases assigned to interviewers in each Field Manager's region. Interviewer identification numbers were also downloaded. Each Field Manager, after taking weekly reports from an interviewer on case progress, would update the case disposition in the FMS and enter interviewer labor and cost information. Each Field Manager then transmitted the data to the Chicago office for merging. The merged data was then transmitted to the project management staff, and the updated data from each Field Manager was transmitted back ready for further updating the following week. Approximately once a month during Phase 2, FMS reports were reconciled with SMS reports.

Site Office Tasks

During Phase 1, site office staff were responsible for entering information about the participant sample into the SMS (see earlier discussion) after all listing, sampling and abstraction activities were completed for each cooperating program. Site staff also reviewed all listing and sampling forms and documentation for completeness and accuracy, providing immediate feedback to the appropriate Field Manager on any problems. A checklist/problem form was completed for each program and kept with the case. As needed, questions about sampling problems were resolved with project management or sampling staff.

After all participant information was entered into the SMS, site clerks did a zipcode sort, and transmitted the sorted lists to the Field Managers. This was the basis for making interviewer assignments for Phase 2.

During Phase 2, site office staff were responsible for receipting completed case dispositions into the SMS, initial and follow-up mailings of participant and contact letters, filling interviewer supply requests, and a number of edit and quality control tasks. These tasks are described further in Supplement 3.

Site Office Security and Confidentiality Procedures

All site office staff signed the NORC confidentiality statement; all signed forms remain on file. Doors to the lobby outside the site office and to the site office itself were locked. Only authorized personnel had keys to the doors. All confidential materials were stored within this secure area in locked file cabinets. On weekends and after 6 pm, the building elevator would not stop at the floor where the site office was located without special "unlocking" of the elevator by the security guard. In order for this to occur proper identification needed to be presented. In addition, everyone entering the building was required to sign in at the security station, and sign out again when leaving.

Data Processing

A separate CADE (computer-assisted data entry) program was developed for each of the CALDATA data collection instruments. The initial step in the CADE development process was a meeting between project management staff, programming staff, and data entry staff to determine general entry specifications for each item in a given instrument. Subjects typically covered in such meetings were: whether uncoded verbatim responses are to be entered, and if so, to what extent; where and how consistency checks among items will be included; the most sensible order in which items appearing on a chart of rows and/or columns should be entered, and setting allowable ranges.

Once general specifications were reached, a programmer wrote and tested the CADE program. Project staff evaluated frequencies produced from test runs to make sure the data appeared in the desired form. Adjustments to the program were made as necessary based on the post-test comments. Additional modifications, such as range adjustments were made during the CADE process.

Provider Questionnaire (PQ) Data Preparation Procedures

Receipt Control: No system-based logging in of cases received at Lake Park was required for the PQ; field staff at the California site office tracked the completion of this component using the SMS. Completed cases were mailed in one Federal Express shipment. Field staff sorted completed cases by case ID and produced a transmittal listing all cases sent. The transmittal was sent by FAX to NORC/Lake Park. The focus of the transmittal was on the sender, to ensure the completeness of the shipment. Receipt control staff opened the Federal Express packages and placed the cases on the shelves for access by the CADE operators and supervisor. A full edit was done for each PQ after receipt.

CADE: Paris Smith supervised the CADE operation. After user-acceptance testing and CADE training, CADE operators keyed the cases. Ten percent of all cases keyed were randomly selected for verification. Selected cases were independently rekeyed by a second, different operator. Electronic data files were compared and discrepancy reports were produced. Discrepancies were adjudicated by the CADE supervisor using the hardcopy case for reference. Feedback to operators was provided. A CADE error rate control chart was produced.

Library: After CADE, all cases were filed by PQ case ID in the library pending final disposition instructions.

Participant Abstraction Record (PAR) Data Preparation Procedures

Receipt Control (RC): No logging in of cases received at Lake Park was required for the PAR. Completed cases were mailed in three bulk shipments from the California site office to Lake Park via Federal Express. Field staff sorted cases by case ID and sent a transmittal by FAX to the Lake Park site. RC staff opened the Federal Express packages and placed the cases on the shelves for access by the CADE operators and supervisor.

An abbreviated edit of each case was done by the California site office staff, making sure percents were written correctly and that all numerical entries were legible.

CADE: Smith supervised the CADE operation. After user-acceptance testing and CADE training, CADE operators keyed the cases. Verification and adjudication procedures were the same as those for the PQ.

Library: After CADE, all cases were filed by PAR case ID in the library pending final disposition instructions.

Participant Questionnaire Data Preparation Procedures

Receipt Control (RC): Site staff performed a coding edit on the first 600 cases prior to shipping to Lake Park. There were three bulk Federal Express shipments of coded cases. The cases in these shipments were sorted by case ID. A transmittal list of the cases in each shipment was sent by FAX to Lake Park. The focus of the transmittal was on the site clerk, to ensure the completeness of the shipment. Cases were shipped to Lake Park weekly after the initial three shipments. Transmittals were sent by FAX and reconciled against the list of logged-in cases. The site office was notified of any discrepancies.

RC staff were required to log all cases (both completes and NIRs) into an SMS file upon receipt from the field. The simplified SMS used at Lake Park complimented the full-function SMS used at the California site office. RC staff indicated in the system only whether the case had been received at Lake Park or not. The system notified the RC clerk when the case being logged in had been selected for validation. The RC clerk then stamped the case materials accordingly and set them aside for completion of the validation form. After the RC staff completed the validation forms, they were then sent to the field staff who conducted the validation interviews.

The coding edit required a review of all questions that had the interviewer instruction "record verbatim" or "other specify" and assigning of new codes where needed. Coding staff reviewed ten percent of the 600 cases coded by the field staff in the California site office. Lake Park coding staff performed the coding edit on all remaining completed cases. The edit specifications are contained in Supplement 3 to this report. The questions showing the added codes are contained in the annotated questionnaires in Supplement 1.

CADE: Belinda Willis supervised the CADE operation. After user-acceptance testing and CADE training, CADE operators keyed the cases. Verification and adjudication procedures were the same as those for the PQ.

Library: After CADE, all cases were filed by participant case ID in the library pending final disposition instructions.

NORC/Lake Park Security and Confidentiality Procedures

All Lake Park staff signed the NORC confidentiality statement. All signed forms remain on file. All doors to the Lake Park site are locked and can be opened only by keying an access

code. Only authorized personnel are given the access code, which is changed frequently. All confidential materials are stored within this secure area. Other guests enter through the third floor when buzzed in by the receptionist. They must sign in, sign a reminder of NORC's confidentiality pledge, and sign out again when leaving the secure area.

File Preparation

Several steps were taken to clean questionnaire data and ensure data quality:

1. Range and consistency checks were programmed into the CADE programs.

2. Programs were tested before use by a wide range of project staff, including programmers, the questionnaire designers, and the CADE supervisors.

3. Data entry staff were responsible for monitoring the responses in the questionnaire against the CADE program and resolving inconsistent responses.

Batch cleaning programs, as a first step, verified the checks programmed into the CADE programs. Following that, additional consistency or logic checks were programmed. In some cases, this resulted in changes to the data. The analysts made extensive use of the logic checks during their work.

The final ASCII-encoded files were delivered on diskette. Variables were defined as numeric. Questionnaire data were in flat file format. SAS cards were included that will enable users of the data sets to work with the file as is or create their own working SAS system file. Print files of frequencies on the data files were also provided.

The participant data files included data from two instruments merged into a single record for each participant. The first part of the record contained data from the participant abstraction form. The second part of the record contained data from the interview. At the end of each participant record, weights variables, final case dispositions and other useful, non-questionnaire variables were appended. There were two participant data files--one for the participants who completed the questionnaire for discharged participants and one for participants who completed the continuing methadone maintenance questionnaire. The first questionnaire file contained also records from methadone maintenance sample respondents who completed a questionnaire for discharged participants. Similarly, the second questionnaire file contained records of respondents in the discharge sample who completed a continuing methadone maintenance questionnaire.

The Provider questionnaire data was sent in a separate file. The Provider dataset was unweighted.

As a result of a confidentiality analysis, certain variables were removed from the original data files in the preparation of the final files. With a few exceptions, every variable reporting the day of occurrence of an event was removed. For example, the date of birth is reported as month and year only. In addition, all verbatim variables were removed because these variables

frequently contained names of places and people. Finally, names, addresses, and telephone numbers of participants and of treatment facilities were excluded from all files.

Documentation included camera-ready copies of the provider questionnaire, the abstraction form and both participant questionnaires, all annotated with variable names, and a detailed description of the variables appended to the data files. Diskettes with CALDATA software and documentation in the form of internal SAS comments and other internal comments were also provided.

Appendix 1:

Sample Design of CALDATA

1. Overview of the CALDATA sample

CALDATA is a survey of California drug and alcohol service providers that receive funding from the State of California and of participants in the programs of these providers. The CALDATA sample was designed to evaluate the effectiveness of programs in each of five drug and alcohol service modalities:

1. Social model recovery (n = 23 sample programs)
2. Methadone detoxification (n = 19 sample programs)
3. Nonmethadone outpatient (n = 29 sample programs)
4. Residential treatment (n = 21 sample programs)
5. Methadone maintenance (n = 18 sample programs).

TOTAL SAMPLE PROGRAMS = 110.

CALDATA is based on scientifically valid probability samples of California providers in the five modalities and of participants in the programs of these providers. Roughly equal numbers of providers and participants were sampled from the five modalities.

Multiple-modality providers, that is, providers offering more than one of the five modalities of service, had independent chances of being selected into the CALDATA sample in each of the modalities that they offered. There were a total of nine sample providers that were independently selected in two different modalities. Seven were selected in both modality 2 and modality 5, and two were selected in both modality 3 and modality 4. Thus, while 110 programs were sampled, the number of distinct providers in the sample equals only 101 (110 - 9).

Within each of the five modalities, the CALDATA sample design featured an approximately equal probability selection of participants in California-funded drug and alcohol recovery services who were discharged from the modality during the reference period extending from October 31, 1991 through September 30, 1992. That is, all participants in California who were discharged from a specified modality during the reference period, and whose discharge was recorded in the California Alcohol and Drug Data System (CADDS), had about the same chance of being selected into the sample. The list of providers in CADDS was the sampling frame for the selection of sample providers in CALDATA.

The five sample modalities (strata) were operationally defined using CADDS variables.

<u>1. Social model recovery</u>: A provider offers this modality if and only if
1. The first digit of CADDS 7-digit provider ID equals "A" (alcohol services)
and 2. Either the number of CADDS TYPE 7 (i.e., residential/treatment/recovery, 31 days or more) discharges is greater than zero or the number of TYPE 7 admissions is greater than zero.

<u>2. Methadone detox</u>: A provider offers this modality if and only if the number of CADDS TYPE 3 (i.e., nonresidential/outpatient/detox) methodone active clients is greater than zero and the number of TYPE 3 discharges is greater than zero.

3. Nonmethadone outpatient: A provider offers this modality if and only if
1. The number of CADDS TYPE 1 (i.e., nonresidential/outpatient/treatment/ recovery) methadone active clients equals zero
and 2. Either the number of CADDS TYPE 1 discharges is greater than zero or the number of CADDS TYPE 1 admissions is greater than zero.

4. Residential treatment: A provider offers this modality if and only if
1. The program does not offer social model recovery (modality 1 above)
and 2. Either the number of CADDS TYPE 7 discharges is greater than zero or the number of CADDS TYPE 7 admissions is greater than zero or the number of CADDS TYPE 6 (i.e., residential/treatment/recovery, 30 days or less) discharges is greater than zero or the number of CADDS TYPE 6 admissions is greater than zero.

5. Methadone maintenance outpatient: A provider offers this modality if and only if
1. The number of CADDS TYPE 1 methadone active clients is greater than zero
and 2. Either the number of CADDS TYPE 1 discharges is greater than zero or the number of CADDS TYPE 1 admissions is greater than zero.

Due to long average durations of treatment in the fifth modality, i.e., methadone maintenance outpatient, we decided to select roughly equal samples of former participants who were discharged during the reference patient and participants who were currently enrolled as of January, 1993. Therefore, this report distinguishes the "discharge methadone maintenance" and "continuing methadone maintenance" samples, whereas the sample of each other modality pertains strictly to participants who were discharged during the reference year.

Given this design, the CALDATA sample provides a basis for statistical inferences about California-funded recovery service outcomes (and other items of information to be collected from sample participants) in the California target population and in various subpopulations of California, including sample strata such as modality and ecological subarea of California, e.g., Bay, Mountain, Southern Urban, and Valley subareas.

The following sections provide detailed technical documentation of the sample design. Section 2 discusses the three stages of sample selection-- selection of sample counties, selection of sample providers within sample counties, and selection of sample participants within sample providers. Section 3 presents a technical derivation of the optimality properties of the CALDATA sample design. Sections 4-6 provide details of the procedures used in the three sampling stages.

2. The Three Stages of CALDATA Sample Selection

The CALDATA sample of drug and alcohol treatment participants was selected in three stages:

Stage 1- selection of counties: We selected 16 of the 58 California counties with probabilities proportional to "dynamic utilization", i.e., their CADDS numbers of drug and alcohol treatment participants or clients during the 10-month period ending in July, 1992.

Stage 2- selection of providers within sample counties: We aimed to select about 105-110 recovery services providers from the population of California-funded providers located in the sixteen sample counties. We apportioned the sample of 105-110 providers equally among five

independent subsamples based on the five treatment modalities, i.e., about 21-22 providers per modality subsample. Independently within each modality, providers were selected with probabilities proportional to their CADDS number of discharges during the 10-month period ending in July, 1992. The independence of sampling in the five modality strata gave each multi-modality provider (i.e., provider offering two or more modalities of service) a probability of being independently selected for two (or more) modality subsamples.

Stage 3- selection of participants within sample providers ("on-site sampling"): Our goal was to select approximately equal numbers of participants from each sample provider in each modality. Based upon assumptions about provider-level and participant-level nonresponse, we aimed for a total sample size of approximately 3500 sample participants, about 700 sample participants in each of the five modalities.

The optimal statistical properties of the CALDATA sample design follow from three properties: 1) selection of counties and of providers within counties with probabilities proportional to size (stages 1 and 2), 2) independent sampling of providers within each modality (Stage 2), and 3) the selection of an equal number of sample participants from each sample provider (stage 3). These three properties result in an equal probability sample of eligible participants in each modality, which is an optimal design feature because of its simplicity and high expected precision. Apportioning the provider and participant sample equally among modalities also yields equal precision for inferences about providers and participants in each modality and maximum precision for detecting differences among modalities.

3. Technical Properties of the CALDATA Sample Design

The following derivation of properties of the CALDATA sample design will be of special interest to technical readers: A key point is that, since counties were selected with probabilities proportional to measures of size (namely, "dynamic utilization" or number of active clients) in the first stage, each measure of size in the second stage, i.e., the number of discharges of a provider, should be divided by the first-stage or county selection probability in order to yield an overall PPS sample of providers. The following derivation shows that, given PPS selection of providers in each modality, taking an equal number of sample discharges (participants) from each sample provider yields an equal probability sample of participants from the target population of participants in the modality.

Specifically, let

PROB1 = the probability of selection of the county (first stage selection probability).

PROB2 = the probability of selection of a provider offering the particular modality, given the county (second stage selection probability).

PROB3 = the probability of selection of a particular participant in the modality (discharge record), given the provider (third stage selection probability).

MOS2 = the measure of size in the second stage, i.e., number of discharges according to CADDS.

b = the constant number of sample discharges (participants) to be selected from each sample provider. (In CALDATA, we set b equal to 34 in order to yield about 26 completed interviews if the participant response rate equals 75 percent.)

f = the overall sampling fraction of participants in the modality.

Then the overall probability of selection of a participant in the modality, say PROB, is given by the product of the first-, second-, and third-stage selection probabilities:

PROB = PROB1 x PROB2 x PROB3

= (f/b) x PROB1 x (MOS2/PROB1) x (b/MOS2)

= f,

which is a constant for all eligible participants in the modality.

Note that the second stage selection probability, PROB2, is proportional to the measure of size of the provider divided by the first stage selection probability of the county. We refer to (MOS2/PROB1) as the "weighted measure of size" ("WMOS") of the provider. (See Kish, 1965, Survey Sampling, New York: Wiley, Chap. 7.)

In the CALDATA design, the overall sampling fraction f varies across modalities. This is because the design calls for equal samples from the five modalities, in order to optimize the precision of comparisons of outcomes across modalities. The sampling fraction f varies appreciably because the overall subpopulations of participants in the different modalities are highly unequal in California. Based on CADDS data for sample counties in the fiscal year ending September 30, 1992, we calculated that there were 111 modality 1 providers with about 4990 modality 1 discharges, 73 modality 2 providers with 41,420 modality 2 discharges, 302 modality 3 providers with 33,296 modality 3 discharges, 158 modality 4 providers with 12,194 modality 4 discharges, and 75 modality 5 providers with 13,595 modality 5 discharges. Since the CADDS discharge data we received covered only the ten-month reference period ending July 31, 1992, we multiplied by a factor of 12/10 = 1.2 to estimate discharges in the twelve-month period ending September 30, 1992.

In each modality subsample, we aimed for a final sample of 34 sample participants from each of 21 sample providers. Hence, we planned a subsample size for each modality of about 21 x 34 = 714 participants. The overall sample size is the sum of the modality subsample sizes, i.e., 5 x 714 = 3,570 participants. It follows that the overall sampling fraction f equals 714/4990 = 14.31% in modality 1, 714/41,420 = 1.72% in modality 2, 714/33,296 = 2.14% in modality 3, 714/12,194 = 5.85% in modality 4, and 714/13,595 = 5.25% in modality 5. To provide for strictly integer skip intervals in the third stage sampling (on-site selection of participants), the sampling fractions (participant selection probabilities) already vary slightly among participants in the same modality stratum (see Attachment 5). Due to differential non-response and to the anticipated need to adjust the participant sampling fractions in sample providers where the target population of participants is found to be much smaller or much larger than expected (i.e., where the actual number of discharge records is found to be much different from the CADDS measure of size), we expected the selection probabilities within modality subsamples to be even more variable when the data collection is completed.

As discussed in Section 6 of this Appendix, the discrepancies between expected numbers of eligible participants (i.e., based on CADDS) and actual numbers of eligible participants (i.e., based on interviewer visits) were so large that modifications had to made in the specifications for on-site sampling of participants. These modifications were designed to produce manageable

abstractor workloads in sample providers while preserving, as much as possible, the optimal properties of the original CALDATA sample design.

4. Stage 1- Selection of Counties

We selected 16 of the 58 California counties with probabilities proportional to their CADDS numbers of drug and alcohol treatment participants or clients. The county selection was carried out using the following five steps:

Step 1: Sampling frame. The sampling frame based on CADDS data showed the numbers of clients for 56 California counties. No data were reported for Alpine County so we assumed no participants and excluded Alpine from the selection. Sutter and Yuba Counties were reported on a single line, "Sutter/Yuba", so we treated these two counties as a single county. These two properties of the frame account for why there are only 56 counties, rather than 58, in the sample selection.

We made one modification to the data in the sampling frame. For Santa Clara County, the frame reported only the number of drug participants. No data were available for the number of alcohol participants in Santa Clara County. We therefore estimated the total number of drug and alcohol participants in Santa Clara using the following procedure:

a. Based on Department of Alcohol and Drug Programs, 1992, California Master Plan, p. A-9, there were 39,215 alcohol participants in California in 1989.

b. Based on data provided by the State of California, the California allocation for alcohol alone (excluding drugs) was $76,362,700 in fiscal 1991.

c. Based on A and B, we estimate the average allocation per alcohol participant in California was $76,362,700/39,215 = $1947.

d. Based on data provided by the State of California, the Santa Clara County allocation for alcohol alone was $3,849,700 in fiscal 1991.

e. Based on c and d, we estimated the number of alcohol participants in Santa Clara County as $3,849,700/$1947 = 1977.

f. We added the estimated number of alcohol participants (1977) to the estimated number of drug participants (2002) to get an estimate of 3979 drug and alcohol participants in Santa Clara. This was the measure of size for Santa Clara that was used in the county selection.

Step 2. Stratification. Based on consultation with the California sponsors, we grouped the 56 counties into four sampling strata: BAY AREA, MOUNTAIN, SOUTHERN URBAN, and VALLEY. The exact counties that were included in the four strata, their CADDS numbers of participants, and 1990 population counts are available on request.

Step 3. Certainty selections. We first computed the sampling interval by dividing the total number of participants in California, i.e., 142,415, by the number of counties to be selected, i.e., 16: INTERVAL = 142415/16 = 8900.9. There were four counties larger than this interval: San Fransisco (13635), Los Angeles (42617), Orange (10445), and San Diego (10412). We designated these four counties as certainty selections, i.e., to be selected into the sample with probability 1.

We then recomputed the sampling interval: INTERVAL = (142415 -13635 - 42617 - 10445 - 10412)/(16 - 4) = 65306/12 = 5442.16. Of the remaining (56 - 4) = 52 counties, there were two counties larger than this interval: Alameda (5547) and San Bernardino (5610). We designated these two counties as certainty selection.

We recomputed the sampling interval again: INTERVAL = (65306 - 5547 - 5610)/(52 - 2) = 5414.9. Of the remaining counties, there were none larger than this interval.

In summary, we selected six counties with probability 1. The selection problem was then reduced to selecting 10 counties from the remaining 50 counties using INTERVAL = 5414.9.

Step 4. Geographical ordering and linking within strata. Within each of the four strata, we ordered the non-certainty counties generally along a North-South geographical axis. We designated counties with less than 600 participants as having insufficient size. (The preliminary sample design called for selecting an average of 6 x 25 = 150 participants from each county. Since the distribution of programs by modality was not yet known, it seemed reasonable to make the minimum size equal to four times the average take per county, i.e., 4 x 150 = 600.) Within each modality, we linked counties having insufficient size with geographically contiguous counties to form county clusters with 600 or more participants. A table showing the results of the geographical ordering and linking operation is available on request.

Step 5. Systematic selection. We selected a random number between 1 and 5414 and applied this sampling to the list of county clusters sorted by stratum and geographical location within stratum. The certainty counties were not included in the systematic selection. This PPS selection procedure was exactly as described in Kish, 1965, Survey Sampling, p. 236.

A table showing the CALDATA selected counties with their corresponding first-stage probabilities of selection, equal to 1.0 for the certainty selection and equal to (clients)/5414.9 for the non-certainty selections, is available on request. The sixteen sample counties were Alameda, Fresno, Kern, Los Angeles, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Clara, Solano, Stanislaus, Tehama, and Ventura.

5. Stage 2- Selection of Providers within Sample Counties

Within each modality, we determined the probabilities of selection of providers so as to satisfy two criteria:

a. The probabilities of selection of providers should yield a subsample of approximately 21-22 providers from the target population of providers offering the modality in California.

b. The probabilities of selection of providers offering the modality in California should be proportional to the number of discharges of participants from the modality of treatment during the twelve-month reference period ending in September, 1992.

Given these criteria, the provider sample in each modality was selected in the following five steps:

Step 1- Sampling frame. The sampling frame for the selection of providers included only alcohol and drug recovery services providers in California who received all or part of their funding from the State of California. Like the sampling frame for the selection of counties, the

sampling frame for the selection of providers was provided by the Department of Alcohol and Drug Programs, Health and Welfare Agency, State of California. Data on number of discharges in the provider sampling frame, like the data on active clients in the county sampling frame, were from the California Alcohol and Drug Data System ("CADDS").

The data on number of discharges pertained to the ten-month period Oct. 31, 1991 through July 31, 1992. For the purpose of computing workload estimates and within-provider selection intervals for discharges (participants) in the third-stage of the sample selection, we estimated the numbers of discharges for the twelve-month reference period Oct. 31 through September 30, 1992. This estimation was carried out by multiplying the ten-month discharge counts by a factor of 6/5 = 1.2.

Based on the CADDS sampling frame, we counted a total of 802 providers in California that were funded wholly or partly by the State of California. Using the sampling strata that were defined for the county selection (Johnson, 9/20/92), there were 206 providers (26%) in the Bay stratum, 53 providers (7%) in the Mountain stratum, 314 providers (39%) in the South Urban stratum, and 229 providers (29%) in the Valley stratum. According to CADDS, the 802 providers experienced a total of 105,495 discharges during the twelve-month reference period.

Of the 802 eligible providers in California, we found that 568 (70.8%) were located in one of the sixteen sample counties. These 568 accounted for a total of 90,061 discharges during the twelve-month reference period, i.e., about 85% of all discharges during this period in California.

Of the 568 providers located in sample counties, we found that 497 (87.5%) were eligible for one or more of the five modalities defined in Section 1. The 497 eligible providers accounted for a total of 84,669 discharges during the twelve-month reference, i.e., about 94% of all discharges from California-funded providers in the sixteen counties during the reference year. Detailed inspection of the 5,392 discharges from the 71 ineligible providers in the sixteen counties showed that essentially all of these ineligible discharges (95.4%) were classified as CADDS TYPE 5, i.e., residential/detoxification (non-hospital). We conjecture that the 71 ineligible providers are mainly providers of very short-term services ("drying-out tanks") since there are essentially no active clients in these providers.

Of the 497 eligible providers in sample counties, we found that 198 (40%) qualified for two or more modalities. There were 111 modality 1 providers, 73 modality 2 providers, 302 modality 3 providers, 158 modality 4 providers, and 75 modality 5 providers. A total of 70 providers offered both modality 3 and modality 4. A total of 71 providers offered both modality 2 and modality 5. The percentage of discharged participants in multi-modality providers was highest in modalities 2 and 5 (97 percent and 98 percent, respectively) and lowest in modality 3 (20 percent). Multi-modality providers had independent chances of being selected for the sample in each modality for which they qualified.

Step 2- Stratification. Like the ecological strata used in selecting the county sample, the second-stage strata distinguished broad ecological areas of California. The only differences between the first-stage and second-stage strata are

a. Tehama County, the single county selected from the first-stage "Mountain" stratum, is grouped with "Valley" in the second-stage selection.

b. Los Angeles County, which was a self-representing county in the first-stage, is grouped with "Southern Urban" in the second-stage selection.

In brief, the four sampling strata used in the selection of providers are as follows:

BAY: sample counties Alameda, San Francisco, San Mateo, and Santa Clara.

LOS ANGELES: sample county Los Angeles.

SOUTHERN URBAN: sample counties Orange, Riverside, San Bernardino, and San Diego.

VALLEY: sample counties Fresno, Kern, Sacramento, Solano, Stanislaus, Tehama, and Ventura.

As discussed in the following, these four sampling strata were used to link undersized providers within each modality and to sort the target population of providers of each of modalities 1-5 in the sixteen counties prior to systematically selecting the sample of providers for the modality.

Step 3- Linking of undersized providers. Separately for each of modalities 1-5, undersized providers were linked together to form combined units (i.e., sampling units comrpised of two or more providers) with 40 or more discharges from the modality within the twelve-month reference period. We required linked providers to be in the same modality and to be located in the same sampling stratum (Bay, Los Angeles, S. Urban, or Valley). The purpose of linking undersized units was to ensure that each selected provider or linked group of providers in each modality would have a sufficient number of discharged participants from the modality during the reference period to draw a sample of participants of the required size. The sample design calls for selecting 34 discharge records from each sample provider, but we made the minimum size equal to 40 to allow for possible overestimation of the number of discharges based on CADDS.

We decided to link undersized providers with other undersized providers, rather than to allow the linking of undersized with oversized providers, in order to ensure that the participant subsampling intervals of the small providers were large enough to justify the costs of soliciting the cooperation of these providers. To accomplish this goal, we grouped undersized providers within each modality and ecological stratum in a separate undersized stratum. This yielded a total of 20 (5 x 4) undersized strata. Before drawing a systematic selection of providers within each modality, we sorted the eligible providers by zip code both within the four undersized strata of the modality and within the four sufficient-sized strata of the modality.

Step 4- Computation of systematic selection intervals. In each modality, the unweighted measure of size of a provider is the provider's number of discharges from the modality during the reference period according to CADDS. In each modality, the weighted measure of size of a provider is the provider's number of discharges from the modality during the reference period, according to CADDS, divided by the first stage selection probability of the county in which the provider is located.

The totals of the weighted measures of size for modalities 1-5 were 4,807.54, 42,492.92, 30,660.04, 16,844.02, and 12,675.50, respectively. We aimed to select about 21 providers from each modality. Random variations in the exact number of providers selected are caused by linked undersized providers, by multiple hits of some large providers, and by independent selections of the same provider for two or more modalities. We therefore computed the selection intervals for modalities 1-5 by the dividing each total measure of size by 21: 4,807.54/21 = 228.9 for modality 1, 42,492.92/21 = 2023.5 for modality 2, 30,660.04/21 = 1460.0 for modality 3, 16,844.02/21 = 802.10 for modality 4, and 12,675.50/21 = 603.60 for modality 5.

Step 5- Systematic selection of providers within modalities. The five modalities were treated as explicit strata in the selection. The four ecological areas, undersized vs. sufficient sized within ecological area, and counties within undersized and oversized substrata, and zip code within counties were implicit strata in the selection. That is, separately within each modality, we sorted the file of providers of modality in the sixteen sample counties first by ecological area, second by undersized vs. sufficient sized, third by county, and fourth by zip code. We then carried out a systematic selection of providers within each modality stratum, using the selection interval for the modality computed in Step 3 and with probabilities proportional to the weighted measures of size of the providers. Detailed documentation of the systematic selection is available on request.

The result of the systematic selection is that we selected 23 providers in modality 1, 19 in modality 2, 29 in modality 3, 21 in modality 4, and 18 in modality 5. There were five linked sample providers and no multiple hits in modality 1, no linked sample providers and 2 multiple hits in modality 2, 9 linked sample providers and 1 multiple hit in modality 3, 5 linked sample providers and 5 multiple hits in modality 4, and no linked sample providers and 3 multiple hits in modality 5.

6. Stage 3- Selection of Participants within Sample Providers

The selection of participants within sample providers was carried out on-site by NORC interviewers. The interviewer assigned to each sample provider was responsible for compiling the list of discharged participants from the modality for which the provider was selected and for carrying out a systematic selection of participants from the list using a random start and skip interval provided by NORC's Statistics and Methodology Center. The skip interval of each sample provider was approximately the ratio of the expected sample size (roughly 21-22) and the expected number of eligible discharges based on CADDS. However, we departed from constant expected participant subsample sizes in order to provide integer skip intervals, which are more easy to apply in on-site sampling. The random start was a uniform random number, truncated to the nearest integer, between 1 and the skip interval.

Interviewers were instructed to "call home" if the number of eligible discharges was more than twice as great or less than half as great as the expected number based on CADDS. In these cases, we customarily assigned new intervals and random starts so as to approximately preserve the planned size of the sample. The purpose of these call-home rules was to prevent interviewer staffing imbalances due to unexpectedly large or small numbers of eligible discharges.

Primarily because of unexpectedly large discrepancies between expected and actual eligible list counts in the sample providers, the CALDATA sample design for participant selection (third-stage sampling design) underwent important changes during on-site sampling.
These changes in the third-stage sample design included two kinds of changes: changes in the numbers of participants (clients) eligible to be sampled and changes in the client selection probabilities within sample providers.

Panels A and B of Table 1 compare the original and revised sampling frame (universe) estimates, sample sizes, sampling rates, and weighted sample participants. Both kinds of changes, changes in numbers of eligibles and changes in sampling rates, are reflected in the revised design parameters of Table 1, Panel B. Estimated changes in the numbers of eligible in each modality were based on comparisons of CADDS data to interviewer field counts and also on the assumption that post hoc ineligibles and duplicates comprised the same fraction of the universe as they did of the sample.

There were three kinds of changes in participant sampling rates:

a. Changes in the sampling intervals of individual providers, based on pre-specified rules designed to ensure balanced interviewer workloads ("call homes");

b. Overall reductions in modality sampling rates (except in modality 2) in January, 1993;

c. Provider-specific sample reductions during April and May, 1993.

The changes in sampling intervals based on pre-specified rules ("calls home") affected 31 of 86 cooperating programs. The overall modality reductions ("trims") involved 20% decreases in the sampling rates of modalities 1, 3, and 5 and a 10% reduction in the sampling rate of modality 4. The provider-specific reductions were of magnitudes ranging from 1/3 to 2/3 and affected approximately a dozen provider samples. Note that the number of sample providers in Panel B of Table 1 is smaller than the number of sample providers in Panel A because of four sample providers that were determined to be ineligible only after contacting these providers.

An additional change in the sampling design, adopted in February, 1993, was the selection of a supplementary continuing methadone maintenance (CMM) sample. The purpose of this supplementary sample was to afford better data for a modality in which the typical duration of treatment was known to be longer than in the other modalities. The CMM sample was selected from modality 5 cooperating providers using a procedure that did not directly use CADDS data. The CMM sampling rates were determined by the assumptions a) that the total methadone maintenance sample would be equally divided between discharge modality 5 and CMM and b) that CMM list counts would be approximately equal to the corresponding discharge list counts.

Table 1. CALDATA- Original and Revised Sample Designs

Indicator	Discharge sample modality:					Total Dis-charge sample	Total CMM sample[1]
	Soc. model	Meth. detox	Nonmeth Out T/R	Res. trtmnt	Meth. maint.		
PANEL A. ORIGINAL SAMPLE, 10/15/92:							
Sample providers	23	19	29	21	18	110	N/A
Eligible clients in sample providers2	2425	17669	5976	4182	5839	36091	N/A
Sample clients	740	713	717	707	713	3590	N/A
Sampling rate	.31	.04	.12	.17	.12	.10	N/A
Est. FY92 clients[3]	6506	40325	37917	21793	12039	118581	N/A
PANEL B. REVISED SAMPLE, 9/3/93:							
Eligible sample providers	23	19	27	19	18	106	18
Eligible clients in sample providers[4]	3333	21661	6132	4515	2588	38230	3389
Sample clients[5]	741	825	678	618	365	3227	379
Sampling rate	.22	.04	.11	.14	.14	.08	.11
Est. FY92 clients[3]	6699	49500	50963	21409	8296	136867	9741

Appendix 2:

CALDATA Participant Response Rates and Weighting

This memorandum documents CALDATA participant response rates and weighting and contains technical assumptions. The main conclusions are that the overall CALDATA participant response rates equal approximately 50% for the discharge sample (weighted or unweighted) and 46% for the CMM sample (weighted or unweighted).

In CALDATA, participant nonresponses occurred for two reasons:

1.) Provider-level noncooperation. Sample participants in providers who did not cooperate in the survey were nonrespondents. To estimate nonresponse due to this source, we assume CADDS undercount/overcount, ineligibles, duplicates, and changes in participant sampling rates would have had the same proportionate effects in noncooperating as in cooperating providers. We make this assumption separately within each modality of the discharge sample and also assume that these factors have the same proportionate effect between discharge methadone maintenance (i.e., discharge sample modality 5) and continuing methadone maintenance (i.e., the "CMM sample"). Based on these assumptions, we calculated the following provider-level participant response rates (unweighted and weighted using the inverses of the provider probabilities of selection). In each modality and CMM, the weighted provider response rate (see Table 1, Panel E) equals the sum of the sampling weights of sample participants in cooperating providers (Table 1, Panel C) divided by sum of the sampling weights of all sample participants (Table 1, Panel B).

	PROVIDER-LEVEL RESPONSE RATE-UNWEIGHTED	PROVIDER-LEVEL RESPONSE RATE---WEIGHTED
Modality 1:	0.945	0.907
Modality 2:	0.609	0.665
Modality 3:	0.940	0.786
Modality 4:	0.985	0.951
Modality 5 and CMM:	0.814	0.713

The sampling weights of responding sample participants were adjusted for provider-level nonresponse by multiplying the sampling weight of each respondent by the inverse of weighted provider-level response rate.

2.) Participant-level nonresponse. Sample participants in cooperating providers were nonrespondents either because they could not be located or because they refused to be interviewed. Participant-level nonresponse adjustment factors were computed at the level of individual cooperating sample providers. To adjust for participant-level nonresponse, the sampling of each participant in each cooperating sample provider was multiplied by a factor equal to the inverse of the response rate within the provider.

In summary, the final NR-adjusted weights of respondents are the product of three factors: a) the selection probability of the respondent, b) the provider-level NR adjustment factor of the modality (or CMM sample) and c) the participant-level NR adjustment factor of the provider.

Table 1 presents detailed documentation of provider-level and participant-level response rates and weights.

Panels A and B of Table 1 document the original and revised sampling frame (universe) estimates, sample sizes, sampling rates, and weighted sample participants. We present both original and revised estimates because the CALDATA sample design for participant selection (third-stage sampling design) underwent important changes during on-site sampling. These changes included both changes in the numbers of participants (clients) eligible to be sampled and changes in the client selection probabilities within sample providers. The designs for the two earlier stages of CALDATA sampling, selection of counties (first stage of sampling) and the selection of providers within sample counties (second stage of sampling), are as described in the original sampling memoranda (see Johnson, "Documentation of County Sample," 9/20/92 and Johnson, "Documentation of Provider Sample," 10/15/92).

Both kinds of changes are reflected in the revised design parameters of Table 1, Panel B: Estimated changes in the numbers of eligible are based on comparisons of CADDS to interviewer field counts (see Johnson, "Evaluation of CADDS data quality based on comparison with CALDATA") and also on the assumption that post hoc ineligibles and duplicates comprised the same fraction of the universe as they did of the sample. Changes in participant sampling rates included a) changes in the sampling intervals of individual providers, based on pre-specified rules designed to ensure balanced interviewer workloads ("call homes"), b) overall reductions in modality sampling rates (except in modality 2) in January, 1993, and c) provider-specific sample reductions during April and May, 1993. The changes in sampling intervals based on pre-specified rules ("calls home") affected 31 of 86 cooperating programs. The overall modality reductions ("trims") involved 20% decreases in the sampling rates of modalities 1, 3, and 5 and a 10% reduction in the sampling rate of modality 4. The provider-specific reductions were of magnitudes ranging from 1/3 to 2/3 and affected approximately a dozen provider samples.

Panel C and D document the numbers of provider-level and participant-level responses, respectively. Of an estimated 3227 sample participants in the discharge sample (Panel B), 2746 were in cooperating providers (Panel C), and of these, 1643 were respondents (Panel D). Of an estimated 379 sample participants in the CMM sample (Panel B), 309 were in cooperating providers (Panel C), and of these, 183 were respondents (Panel D). Analogous figures are presented using weighted sample and respondent counts.

Panel E presents unweighted and weighted participant response rates based on provider-level nonresponse, participant-level nonresponse, and both sources combined. These rates are directly computed from the unweighted and weighted counts of Panels B-D.

Table 1. CALDATA- Response Rates

Indicator	Discharge sample modality:					Total Dis-charge sample	Total CMM sample[1]
	Soc. model	Meth. detox	Nonmeth Out T/R	Res. trtmnt	Meth. maint.		
PANEL A. ORIGINAL SAMPLE, 10/15/92:							
Sample providers	23	19	29	21	18	110	N/A
Eligible clients in sample providers[2]	2425	17669	5976	4182	5839	36091	N/A
Sample clients	740	713	717	707	713	3590	N/A
Sampling rate	.31	.04	.12	.17	.12	.10	N/A
Est. FY92 clients[3]	6506	40325	37917	21793	12039	118581	N/A
PANEL B. REVISED SAMPLE, 9/3/93:							
Eligible sample providers	23	19	27	19	18	106	18
Eligible clients in sample providers[4]	3333	21661	6132	4515	2588	38230	3389
Sample clients[5]	741	825	678	618	365	3227	379
Sampling rate	.22	.04	.11	.14	.14	.08	.11
Est. FY92 clients[3]	6699	49500	50963	21409	8296	136867	9741

Table 1. CALDATA- Response Rates

Indicator	Discharge sample modality:					Total Dis-charge sample	Total CMM sample[1]
	Soc. model	Meth. detox	Nonmeth Out T/R	Res. trtmnt	Meth. maint.		
PANEL C. SAMPLE PARTICIPANTS IN COOPERATING PROVIDERS:							
Cooperating Providers	21	13	23	18	12	87	12
Eligible clients, cooperating providers	3013	13247	5354	4500	2096	28210	2745
Sample clients, cooperating providers	700	503	637	609	297	2746	309
Weighted sample clients-sample wts.	6079	32940	40034	20370	5916	105338	6946
Weighted sample clients-adjusted for provider NR	6699	49500	50963	21409	8296	136867	9741
PANEL D. INTERVIEWS IN COOPERATING PROVIDERS							
Respondents	392	293	394	337	227	1643	183
Weighted respondents	3389	19057	24389	11648	4528	63010	4231
Weighted respondentsadjusted for NR	6699	49500	50963	21409	8296	136867	9741

Table 1. CALDATA- Response Rates

Indicator	Discharge sample modality:					Total Dis-charge sample	Total CMM sample[1]
	Soc. model	Meth. detox	Nonmeth Out T/R	Res. trtmnt	Meth. maint.		
PANEL E. PARTICIPANT RESPONSE RATES:							
i. Based on provider response only- Unweighted (Panels B-C)	94.5%	60.9%	94.0%	98.5%	81.4%	85.1%	81.4%
ii. Based on provider response only- Weighted (B-C)	90.7%	66.5%	78.6%	95.1%	71.3%	77.0%	71.3%
iii. Based on client response in cooperating providers- Unweighted (C-D)	56.0%	58.3%	61.9%	55.3%	76.4%	59.8%	59.2%
iv. Based on client response in cooperating providers- Weighted (C-D)	55.7%	57.9%	60.9%	57.2%	76.5%	59.8%	60.9%
v. Overall response rate- Unweighted (i x iii)	52.9%	35.5%	58.2%	54.5%	62.2%	50.9%	48.1%

Table 1. CALDATA- Response Rates							
Indicator	Discharge sample modality:					Total Dis-charge sample	Total CMM sample[1]
	Soc. model	Meth. detox	Nonmeth Out T/R	Res. trtmnt	Meth. maint.		
vi. Overall response rate-Weighted (ii x iv)	50.5%	38.5%	47.9%	54.4%	54.5%	46.0%	43.4%

NOTES TO TABLE 1:

1. The continuing methadone maintenance (CMM) sample was selected from modality 5 cooperating sample providers using a procedure that did not directly use CADDS data. The CMM sampling rates were determined by the assumptions a) that the total methadone maintenance sample would be equally divided between discharge modality 5 and CMM and b) that CMM list counts would be approximately equal to the corresponding discharge list counts.

2. CADDS discharge counts received from California pertained only to the first ten months of FY92. We estimated FY92 discharges by multiplying by 1.2.

3. The total clients in each modality is estimated using the weighted sum of eligible clients of sample providers in the modality. The weight of each provider equals the inverse of its selection probability.

4. We use interviewer field counts of eligible clients for cooperating providers and adjusted CADDS estimates for non-cooperating providers. The CADDS estimate for each modality is adjusted by two factors: a) the ratio of the total field list count and the total CADDS count of cooperating providers in the same modality and b) the complement of the estimate of post hoc sample ineligibles. We assume these adjustment factors are equal between the discharge modality 5 and CMM samples.

5. The revised sample sizes are due to two sources of change: a) change in counts of eligibles and b) changes in selection probabilities.

Appendix 3:

Definitions and Basis for Key Benefits Calculations

Figure 1. Definitions of Benefits

	Costs to Society	Costs to Taxpaying Citizens
Criminal Justice System Costs	●	●
Victim Losses	●	●
Theft Losses		●
Health Care Utilization	●	●
Lost Legitimate Earnings	●	
Income Transfers		●

Criminal Justice System Costs: the cost of police protection services, prosecution, adjudication, public defense, and corrections (incarceration and parole/probation).

Victim Losses: victim expenditures on medical care, repairs of damaged property, and lost time from work that result from predatory crimes.

Theft Losses: the estimated value of property or money stolen during a crime, excluding any property damage or other victim losses. There is no net loss to society when theft occurs, only to taxpaying citizens.

Health Care Service Utilization: the economic value of inpatient, outpatient, and emergency medical care and inpatient and outpatient mental health care that could have been avoided.

Lost Legitimate Earnings: the value of legitimate productivity lost because individuals pursue income through crime or live off the resources of friends, families, or others.

Income Transfers: transactions in which resources are moved from non-substance abusing tax-payers to others via gifts, public assistance, or public and private disability insurance.

Figure 2. Basis for Key Benefit Calculations: Crime

Components	Sources of Data	Method for calculating average values	Participant Data Employed
Police Protection from Crime	1990 Justice Expenditure and Employment, 1992 Sourcebook of Criminal Justice Statistics	Cost per arrest (police expenditures divided by all arrests) times likelihood of arrest (number arrests divided by number incidents).	Number of crimes, by type of crime
Adjudication and Sentencing	(same as police protection)	Estimated expenditures on crime-related court and legal costs divided by total arrests.	Number of arrests
Corrections	(same as police protection)	Divide expenditures on institutions and probation/parole by inmates and parolees/ probationers, respectively.	Period of time (1) incarcerated or (2) on probation/parole
Victim costs	1991 National Criminal Victimization Survey.	Averages value of medical care, lost work days, and property damage, by type of crime.	Number of crimes, by type of crime
Theft losses	1991 National Criminal Victimization Survey.	Separate averages for value of cash and property stolen, by type of crime, where population base included all victimizations.	Number of crimes, by type of crime

Figure 3. Basis for Key Benefit Calculations: Health and Productivity

	Components	Sources of Data	Method for calculating average values	Participant Data Employed
HEALTH	Outpatient medical care	Analysis conducted by Lewin-VHI of Ambulatory Care Survey	Cost per outpatient visit.	Visits to doctor
	Inpatient medical care	1992 Hospital Statistics and 1987 National Medical Expenditure Survey.	Cost per inpatient day, plus physician fees.	Nights spent in hospital
	Emergency Room use	1992 Hospital Statistics	Emergency department/ outpatient visits divided by revenues, plus physician fees.	Trips to emergency room
	Outpatient mental health care	Mental Health, United States, 1992.	Estimated number of patient days divided by total outpatient revenues	Visits to counselor or professional for mental health
	Inpatient mental health care	Mental Health, United States, 1992.	Estimated number of inpatient days divided by total inpatient psych revenues	Whether admitted to inpatient psychiatric facility
PRODUC-TIVITY	Loss of earnings from legitimate work	Money Income of Households, Families, and Persons in the United States: 1991. Employee Benefits Research Institute Databook, 1992.	Age and gender-controlled mean income (including non-earners), "loaded" for mandatory benefits (e.g., unemployment) and voluntary benefits (e.g., health insurance).	Longest legitimate full- and part-time work, wage rates, and months worked at those rates.
	Welfare and disability "transfers"			Amount of money received from disability and welfare sources.

Appendix 4:

Methodology for Estimating Benefits and Costs of Treatment

The approach used in this analysis is patterned after the benefit-cost analysis framework used by Harwood and colleagues in the analysis of the Treatment Outcome Prospective Study data as well as prior work by Harwood and colleagues in estimating the health, crime, and productivity costs to society that can be attributed to drug abuse. In the prior work, cost components were the "tangible consequences of drug abuse which can be assigned dollar values." A benefit is therefore said to exist when expected costs are avoided--in our case, as a result of changes in behavior that are logically linked to the receipt of drug and alcohol treatment. This appendix describes the two step process of (1) recoding client data and (2) deriving and applying dollar values to specific variables.

1. Recoding Conventions

All data have been converted to continuous values for the purpose of summing "cost events." To calculate a value from a coded range, we simply took the midpoint of the range, rounding to the lowest integer value. "6 to 20" becomes "13," "2 to 5" becomes "3." When comparisons were to be made between segments 1-3 (pre, during, and post treatment), we either annualized the values or converted values to a "daily rate." We calculated total annual events by the following:

Annual Events = Events Reported x (365 / Days in reporting period).

This inflated values for Segment 2 (where the average length of stay was around 95 days) and deflated values for Segment 3 (where the average post-treatment span was around 435 days).

Where we calculated the "rate of events per unit of time" such as crimes per day, we based our calculations *on the proportion of time that the respondent was <u>not</u> incarcerated.* In other words,

Rate = Events x [365 / (Days in reporting period - Days Incarcerated)].

A variation on this was used when "events" were calculated based on a "rate:"

Annual Events = Daily Rate x (Days in period - Days Incarcerated)
* [365 / (Days in period)].

A "daily rate" is simply the annual rate divided by 365 days.

A measurement issue which turned out to be important for during- and post-treatment crimes was that the coded ranges for crimes had a maximum value of 101. For segment 1, which was 1 year in duration, this implies that no value for annualized pre-treatment crimes could be greater than 101. However, for segments 2 and 3, 101 was also the maximum range. When 101 crime events were annualized for the average length of stay (95 days), the annualized number of crimes for segment 2 counted in the hundreds. This survey design issue resulted in the need to truncate values at a level commensurate with the segment 1 cap of 101 annualized events.

Missing data were handled in two ways. For the most part, legitimate skips or item refusals were coded to reflect "zero" values. For example, if the number of robberies committed was missing,

we inferred the value to be zero. This biases the findings in favor of the null hypothesis that treatment did not have an effect, but nonetheless allowed all cases to be left in the analyses. Functionally, this is no different from summing events (as we have done) where some data are missing: summing non-zero values in either case gives the same total.

The other type of missing data problem encountered in our analyses was that 40% of respondents who were in treatment for less than a month were skipped out of all question sequences dealing with crime, health, and employment. Also, for about 140 respondents who were incarcerated for more than 3 months during the post-treatment segment, the questionnaire skipped sections on crime, health, and employment. It is reasonably expected that, despite having been skipped from these sections, real client values are actually non-zero. Our approach in both events was to calculate an average rate of reduction by modality for each variable of interest, then apply this average rate to the pre-treatment values to generate a complete set of during- and post-treatment values.

The approach just described for imputing data when sections were skipped was also used for those few critical variables asked in segments 1 but not segments 2 and 3. For example, respondents were asked about engagement in nine types of crime in segment 1 but only 4 consistent categories in segments 2 and 3. We analyzed data to assess the association between variables for which we do have segment 2 and 3 values and segment 1 crime categories. We found strong associations between the following, and applied the reduction rates from segments 1-2 and segments 1-3 from these "surrogate" variables to the segment 1 crimes not asked in segments 2 and 3:

Driving Under the Influence:	Number of Days Taking Drugs/Alcohol
Motor Vehicle Theft:	Robbery
Shoplifting:	Burglary
Other crimes for gain:	Burglary+Robbery
Other crimes:	Burglary+Robbery

2. Conversions to Dollars

The three major categories of substance abuse-related costs (and benefits) are crime, health, and productivity. In this study, data were available on client behaviors during the year prior to treatment, the time when the client was in treatment, and the time following treatment to the date of interview. This study has calculated the costs associated with criminal behavior, health care utilization, labor force productivity, and welfare/disability by assigning average values in 1991 dollars to each criminal act, health care utilization, earnings, and welfare/disability receipt the client reported in the interview. The following spreadsheets show how client self-reports for earnings, medical care, police protection, corrections system interaction, and victim costs (respectively) were valued.