INCREASING RESPONSE RATES
IN FOLLOW-UP SURVEYS OF DRUG TREATMENT PATIENTS

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Key words: Sampling, nonresponse bias

National and regional surveys of drug treatment patients conducted during the past two decades have sought to evaluate alternative treatments across a range of outcomes such as drug use, criminal activity, and labor market behavior. Such studies have employed two-stage sampling designs: 1) selection of drug treatment providers and 2) selection of patients within selected providers, and have measured substance use based on retrospective reports of drug use and other behaviors by sample patients. Nonresponse occurs at the first stage due to noncooperation of the sample providers and at the second stage due to problems of locating and gaining cooperation from sample patients. Evaluation of the levels, causes, and consequences of nonresponse in drug treatment outcome studies has been impossible due to the use of quota sampling at both sampling stages.

This paper evaluates nonresponse based on the recently completed California Drug and Alcohol Treatment Assessment (CALDATA), a retrospective survey carried out by the National Opinion Research Center (NORC) for the State of California. CALDATA is the first drug treatment evaluation survey to use probability sampling. Therefore, CALDATA is unique in affording an understanding of sources and consequences of nonresponse in this kind of survey.

The paper is divided into two sections: The first discusses the design of CALDATA with the goal of assessing how particular design features and field operations contributed to increasing the response rate. We emphasize the important uses of administrative records obtained 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.

The second section uses administrative records to evaluate the consequences of nonresponse for the accuracy of inferences about former drug treatment patients in California. Our main conclusion is that nonresponse in CALDATA resulted primarily from poor-quality patient locating information obtained from providers. Nonresponse is more highly associated with provider characteristics than with patient traits that are likely to condition treatment effectiveness. Comparisons of respondents and non-respondents using administrative records suggest few substantial differences. The implication is that nonresponse does not severely bias the results of the study.

Design of CALDATA

In the first stage sample, we drew a stratified random sample of 110 licensed drug treatment provider units from a list of California-funded providers maintained by the State of California. Providers were selected with probabilities proportional to their numbers of patients, as estimated using California administrative data, within each of five sampling strata ("modalities of treatment"):

STRATUM	SAMPLE PROVIDERS
1. Residential	19
2. Social model	23
3. Nonmethadone outpatient	27
4. Methadone detoxification	19
5. Methadone maintenance	18
TOTAL PROVIDERS	106

The first-stage sample included only 106 providers, since CALDATA interviewers found that 4 of the 110 originally sampled had no eligible patients.

In the second stage sampling, CALDATA interviewers randomly selected approximately 30 former patients from each cooperating provider, using a list of eligible patients developed from the administrative records of the provider. Confidentiality required all sampling to be carried out on-site at the provider facility. Patients who had been discharged from the specified modality of treatment offered by the provider during fiscal 1992 were eligible to be sampled. Interviewers then abstracted two kinds of information about the sample patients from administrative records of the provider, locating infor-

mation and personal history data.

The field data collection period was approximately 9 months, relatively short by long-term follow-up study standards, but a cut-off required by state policy requirements. The field period began in March, 1993, about five months after the end of the one-year eligibility window for discharge of eligible sample patients in September, 1992. The base sample comprised about 3,227 individuals. This number is approximate because we could not list eligible patients in noncooperating providers. It does not include a small supplementary sample we selected of methadone patients who had not been discharged before the end of fiscal 1992.

Of the 3,227 sample patients, approximately 14.9% could not be identified because of provider noncooperation, 18.3% could not be located, 9.8% refused to participate, and 6.1% could not be interviewed because of death, language problems, inaccessible location (even by phone), or other reasons. The number of respondents equals 1,643, and the unweighted response rate equals 50.9%. The weighted response rate, taking into account differences in the selection probabilities of sample patients, is slightly lower (46.0%).

Table 1 presents a breakdown of response rates by modality of treatment. Each stratum response rate is the product of two factors: a) the response rate based on provider cooperation (Panel 1), i.e., assuming all sample patients in cooperating providers were interviewed, and b) the patient response rate in cooperating providers (Panel 2). The overall response rate of 50.9% equals the product of 85.1%, the response rate based on cooperating providers, and 59.8%, the patient response rate.

The first panel of Table 1 shows that response rates based on cooperating providers were greater than 90% in all modalities of treatment except methadone detox (61.0%) and methadone maintenance (81.4%). The relatively low provider cooperation rates in methadone programs were almost entirely due to the noncooperation of two large chains of methadone providers. These chains refused to cooperate based on their insistence they had received no governmental funding.

The second panel of Table 1 shows that the most significant factor in overall nonresponse was patient nonresponse in cooperating providers. The most common source of patient nonresponse was failure to locate the CALDATA sample patient. Such failures had two main causes: 1) deficient locating information obtained from providers and 2) mobile and elusive lifestyles of some former patients. Some providers were able to supply only incomplete or inaccurate locating information, and most supplied too little information for locating homeless or transient patients. We found that names, addresses, and phone numbers of relatives had limited value in contacting sample patients who rarely contacted their families. It turned out that many sample patients had given fictitious names, birth dates, and social security numbers at the time they entered treatment.

Persistence and creativity were key elements in completing more than 60% of the cases assigned to the field (Table 1, Panel 2). Interviewers implemented a variety of creative locating approaches, such as "hanging out" at homeless centers and in drug-dealing areas of urban centers. Project staff also canvassed many kinds of administrative record systems for locating information. These systems included voter registration lists, credit bureau records, jail lists, California state prison locator data, vital statistic records, Veterans Administration records, death registration forms, directory assistance records, postcards and letters posted at homeless shelters and at the provider, records of contacts with homeless shelters, motor vehicle records, and medical eligibility records (Medi-Cal).

Early in the field period, we obtained authorization to access prison locator data from the California Department of Corrections and weekly jail lists for California counties. Approximately 10% of sample patients were found to be incarcerated. We also obtained authorization to conduct interviews in the Federal Bureau of Prisons. Many prisoners are moved frequently and tracking them proved to be time-consuming.

Future planning of retrospective 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 to gaining the cooperation of large provider chains. Additional steps might be to obtain authorization to access probation records as well as prison and jail lists, obtain earlier access to state motor vehicle and medical eligibility files, and carry out more frequent review of these records as they are updated during the field period.

We also think prospective designs might have advantages in increasing both provider and patient response rates. If sample patients were selected from current clients on a flow basis, locating information and pledges of cooperation could be obtained at the time patients were selected into the sample. Project staff could be assigned to work with provider staff to inform and encourage patient cooperation 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. A key issue in finding the balance is the extent of bias caused by nonresponse.

Analysis of Nonresponse

This section analyzes possible biases due to two sources of CALDATA nonresponse, provider noncooperation and patient nonresponse in cooperating providers.

1. Bias due to provider noncooperation. To evaluate this source of bias, we compared survey response distributions on a number of patient and provider characteristics to corresponding distributions computed using the California subfile of the FY90-91 National Drug and Alcoholism Treatment Unit Survey (NDATUS). NDATUS also encounters provider nonresponses, so it cannot be considered a universe of which CALDATA is a subset, but a partially overlapping set of program units. However, the California subfile of NDATUS has a high estimated provider response rate relative to other states, close to 93%.

Table 2 shows the results of comparisons of three patient attributes, i.e., age (less than 25, 25-34, 35 and over), sex, and ethnicity (Black, non-Black Hispanic, and Other), and one provider characteristic, i.e., average weekly staff hours of physicians, psychiatrists, and registered nurses per 100 patients. Since CALDATA detailed modalities cannot be precisely defined using NDATUS, each comparison in Table 2 is presented separately for two broad modalities: residential (including social model and other residential programs) and methadone (including both detox and maintenance programs). The NDATUS estimates are based on population totals for California of 423 residential and 87 methadone programs. The CALDATA estimates are weighted using selection probabilities of sample units adjusted for nonresponse, using providers as weighting cells in each stratum.

Table 2 shows that, for both residential and methadone providers, CALDATA and NDATUS distributions of patients by age, sex, and ethnicity are broadly similar. The two data sources agree that methadone patients tend to be older than residential patients, more likely to be female (especially in NDATUS), more likely to be 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 be approximately 6-7 times higher in methadone programs than in residential programs. These results suggest bias due to provider noncooperation is not severe in the residential and methadone modalities.

2. Bias due to patient nonresponse in cooperating providers. The second panel of Table 1 shows that the patient response rate in cooperating providers equals 62% or lower in every modality except methadone maintenance (76.4%). Information on detailed interview dispositions that were collected as part of the field effort indicate that the principal component of patient nonresponse in every modality was failure to locate the sample patient. Of 1103 patient nonresponses in cooperating providers, about 54% (592 nonresponses) were due to failure to locate, about 29% (315) were due to refusals, and about 18% (196) were due to death, language problems, inaccessible locations, incapacitation, and all other causes.

Table 3 presents comparisons of the characteristics of responding and nonresponding sample patients using data that were abstracted from the administrative records of cooperating providers. Panel 1 of Table 3 presents comparisons of the means of continuous variables, and Panel 2 presents comparisons of percentages. The base n's shown in parenthesis in Table 3 refer to the numbers of CALDATA respondents and nonrespondents who had nonmissing administrative data for the variable being compared.

The main conclusion from Table 3 is that few variables evidence substantial differences between respondents and nonrespondents. Even statistically significant differences, as gauged by two-sample t tests for comparisons of continuous variables (Panel 1) and chi-square tests for comparisons of percentages (Panel 2), tend to be substantively small. The large sample sizes portend that even small differences will attain statistical significance at conventional levels.

Two of the largest (though still relatively modest) differences in Table 3, primary payment source (50% public vs. 45%) and Hispanic ethnicity (37% vs. 30%), are based on program variables with item nonresponse rates greater than 20%. The program data are more complete, however, for gender (38% female vs. 33%) and employment at admission (21% vs. 27%). Women typically respond to surveys at a higher rate than men, which holds in this population as in others. However, the lower response rates of privately paying, employed, and White nonHispanic sample persons are somewhat

surprising. Unless there is a pattern of deliberate concealment, these characteristics would ordinarily lead to higher response rates. These indications agree with comments from some refusers whose characteristics matched those cited that drug use and treatment comprised a "closed chapter" of their lives, which they did not choose to revisit in an interview. If this interpretation is correct, there would be a mild bias toward exclusion of relatively higher income individuals who, by and large, would be expected to have somewhat better treatment prognoses.

Conclusions

The nonresponse analyses produced evidence of at most modest biases due to nonresponse. Both the comparisons of CALDATA to NDATUS (Table 2) and of CALDATA respondents and nonrespondents (Table 3) suggest that respondents and nonrespondents are similar in demographic characteristics. The results of Table 3 are more compelling because of the wide variety of patient characteristics that were measured, including measures of pre-treatment and within-treatment substance use and treatment services.

Our hypotheses to account for the generally small differences between respondents and nonrespondents are as follows:

1) Nonresponse at the level of individual patients results primarily from poor-quality address and other locating information (criminal justice, hospital, social security, etc.) and secondarily perhaps from a small degree of differential nonresponse by higher income individuals;

2) The quality of available locating information may be largely independent of the social attributes of patients, with the exception noted above.

The second hypothesis is important because it suggests nonresponse may also be largely independent of treatment outcomes. In future research, we propose to investigate these hypotheses using multi-level models that include both provider and individual traits as predictors of nonresponse.

Table 1. CALDATA Unweighted Response Rates by modality

Indicator	Modality of treatment					Total
	Resident.	Soc.mod.	NM OP	M.detox	M. maint.	
Panel 1. Response rate based on provider cooperation						
Sample providers	19	23	27	19	18	106
Cooperating	18	21	23	13	12	87
Sample patients	618	741	678	825	365	3227
Sample patients in cooperating	609	700	637	503	297	2746
Resp. rate based on providers	98.5%	94.5%	94.0%	61.0%	81.4%	85.1%
Panel 2. Patient response rate in cooperating providers						
Respondents	337	392	394	293	227	1643
Patient resp. rate	55.3%	56.0%	61.9%	58.3%	76.4%	59.8%
Panel 3. Overall nonresponse rates						
Product of 1&2	54.5%	52.9%	58.2%	35.5%	62.2%	50.9%

Table 2. Comparisons of CALDATA (weighted) and NDATUS.

Variable	Statistic	Modality			
		Residential		Methadone	
		CALDATA	NDATUS	CALDATA	NDATUS
Age of patients	% < 25	13%	21%	5%	7%
	% 25-34	48%	40%	35%	32%
	% >= 35	39%	39%	60%	61%
Sex	% female	32%	28%	37%	43%
Ethnicity	% Black	33%	28%	9%	13%
	% Hisp.	11%	15%	46%	37%
Weekly staff hrs. per 100 patients		5	6	33	44

Table 3. Comparisons of unit respondents and nonrespondents. (Base n's in parentheses.)		
Statistic	Respondents (n)	Nonrespondents (n)
Panel 1. Means of continuous variables.		
Length of stay (months)	2.8 (1570)	2.7 (1103)
Age at admission (years)	33.3 (1523)	33.5 (1068)
Education (1 = < high school, 2=HS grad or CED, 3=Beyond HS)*	1.8 (1531)	1.9 (1090)
# Treatment services received	2.9 (1025)	2.8 (733)
# Medications prescribed	1.8 (1580)	1.9 (1103)
Panel 2. Percentages.		
% with self as primary referral source	46% (1410)	46% (1015)
% with legal system as primary referral source	22% (1410)	23% (1015)
% with public as primary payment source**	50% (1316)	45% (871)
% female**	38% (1585)	33% (1103)
% Black (African-American)	15% (1578)	15% (1103)
% Hispanic or Latino**	37% (1319)	30% (929)
% employed at admission**	21% (1515)	27% (1068)
% with cocaine as primary drug**	15% (1471)	17% (1046)
% with heroin as primary drug**	42% (1471)	40% (1046)
% with alcohol as primary drug**	27% (1471)	29% (1046)
% completing treatment plan**	32% (1643)	31% (1103)
% with aftercare plan stated in record	35% (1643)	35% (1103)
* Significant difference based on two-sample t test, two tail, α = .05. **Significant difference based on chi-square test, α = .05.		