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EVALUATION OF ARIZONA PRETRIAL SERVICES DRUG TESTING PROGRAMS

Final Report to the National Institute of Justice

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Executive Summary

This report describes an evaluation of two programs in Arizona (Pima County and Maricopa County) that attempted to reduce pretrial misconduct by systematic urine testing of defendants, including a program of periodic monitoring of releasees through drug testing and sanctions for non-compliance. In each site two phases of research were undertaken. In the first, a sample of defendants was selected, tested for drug use and followed in the community to ascertain the relationship between drug test result at the initial appearance and pretrial performance. The second phase involved experiments in which some defendants testing positively were assigned on a random basis to either ordinary release conditions or to a program of periodic drug testing with sanctions for non-compliance.

The results of the first phase suggest, in both sites, that knowledge of drug test results does not appreciably improve the ability to estimate pretrial misconduct over and above the ability of existing information available to the pretrial decisionmaker. Some increased ability may be indicated in one site for cocaine use in conjunction with the prediction of pretrial crime (as opposed to failure to appear at required court appearances) but such increase is probably modest and may be difficult to justify financially.

The results of the second, experimental phase, are also not strongly supportive of the idea that significant reductions in pretrial misconduct can be easily achieved by systematic drug testing. In each site two independent experiments were performed. When read together, the most reasonable conclusion is that such monitoring does not substantially affect pretrial misconduct, given the somewhat modest sanction levels applied. Again, financial considerations are highly significant, since drug testing programs of the sort studied here are costly.

In both sites the evaluation team assisted the agencies in the development of "drug risk screening instruments" to help identify those defendants at greatest risk of testing positive at the initial appearance.

The results of this evaluation are conditioned by the specific drugs of concern to the agencies, the relatively modest sample sizes, and the specific nature of the programs. The most general conclusions are that programs of this type should anticipate only small effects (if any at all) on pretrial misconduct, that available methods of estimating pretrial misconduct that do not rely on drug testing probably work about as well as those that include information about drug tests, that sanctioning systems for drug test failures during the pretrial period are difficult to implement, and that pretrial drug screening is costly.

Acknowledgements

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I.   INTRODUCTION.

This report presents the findings from a series of
studies designed to evaluate the Arizona pretrial services
drug testing programs. Two pilot projects have been carried
out, one by the Pima County pretrial services agency and the
other by the Maricopa County pretrial services agency.
Although there are programmatic differences in the two sites
and some minor research design differences, the basic
program structure and purposes of the two programs are
identical. Each project was designed to give urine-sample
drug tests to the pretrial felony populations, to monitor
those defendants who tested positively for selected drugs
through a system of systematic testing and sanctions, and to
examine whether such programs could decrease the pretrial
misconduct rates among the released population through this
combination of screening and monitoring by drug tests. The
sites were funded by the Bureau of Justice Assistance, in
part to provide for further testing of the value of pretrial
drug testing.

I.1. Background hypotheses.   Although there is some
systematic empirical work on the problem of using pretrial
drug tests to help predict pretrial misconduct, the concepts
and the research in this area remain controversial. Two
basic underlying perspectives on this problem exist. The
first views drug use as a distinguishable element or factor

upon which offenders can be expected to differ. Those who use drugs are expected to behave differently, in the short term during pretrial release, from those who do not use drugs. Some think that the drug use may cause future acts of misconduct, whether it be lack of responsibility in meeting the court obligations or the need to commit more crimes in order to obtain the resources necessary to get more drugs. In any event, drug use itself is expected to be an important cause that increases the probability of short-term violations of the law. This view thus sees the causes of pretrial misconduct differing within the pretrial population, and seeks differences among offenders in the form of their potential criminal behavior.

The other view sees drug use by offenders as simply another manifestation of their underlying criminality. In this view, offenders do not differ so much from one another as they differ more or less from other people. Those offenders who commit many crimes in some period should be more likely than those who commit few crimes to commit crimes in the next period. Drug use is seen as one more count of crime. Furthermore, drug use has no independent causal connection to pretrial misconduct, and it will only have that predictive validity associated with the general level of criminal activity for the offender. Most highly active offenders are assumed to be drug users (if the

opportunity presents itself), and drug use would include hard and soft drugs and alcohol.

With respect to pretrial misconduct, the predictions generated by these views are not altogether different--both expect a moderate bivariate relationship between drug test results and pretrial misconduct. But where the first view sees some independent predictive contribution of drug test results, the general crime view sees none, once the level of recent criminal conduct is held constant. On the other hand, it may be that urine-tests for drug use are particularly valid (in measurement terms) indicators of an individual's criminality--and more valid than standard criminal justice records--such that they will have predictive utility even if the general criminality view is correct.

The pragmatic consequences of the correctness of these two views may be considerable. If the first view is correct, and depending on the strength of the independent contribution of drug use to the commission of crimes, then investing the money and manpower necessary for the collection of urine samples, funding the tests of these samples for drugs, conditioning release on their outcome and financing pretrial incarceration or extra supervision for those testing positively may be worthwhile from a community protection standpoint. If the generalist point of view is more correct, then the routinely collected information about

criminal conduct now available to pretrial decisionmakers (e.g., the intensity and frequency of recent criminal conduct) may be as good as is possible to obtain, suggesting the money and effort required to test for drugs use may be unnecessary. Certainly some middle view may turn out to be more correct--that drug tests do have some predictive validity and that they are relatively expensive. Whether they are useful to a local jurisdiction will, perhaps, need to be determined by an assessment of relative costs and benefits at a local level.

The first set of hypotheses concerning the Arizona drug testing program thus derive from the problem of better predicting the pretrial behavior of those on conditional release. The ability of accurate and verified drug test information to add predictive information over and above that now routinely available is thus a question of considerable policy import. Clearly, if the pretrial community had at its disposal a reliable, objective and easily obtained indicator of significant differences in the probability of pretrial misconduct, then this would greatly enhance the goal of community protection pursued by these agencies. On the other hand, if such tests are not demonstrably superior to techniques now readily available to these agencies (e.g., personal interviews and criminal history checks), then the millions of dollars required to fund such programs on a state-wide level could be saved.

A second set of general evaluation issues concerns the second component of the Arizona drug testing programs--the periodic monitoring of pretrial releasees to assess drug use during the pretrial period and, on the basis of such results, to assess treatment needs. Research undertaken in conjunction with the Washington, D.C. drug monitoring program (Toborg, et al. 1987) has suggested that a systematic program of periodic drug testing of pretrial releasees may have important specific deterrent effects, not only on the drug use by the pretrial population, but on the likelihood of pretrial crime in general.

With respect to the monitoring program itself, four general points of view are in dispute. In one, it is believed that the fear of sanctions subsequent to testing positively in the monitoring program will cause a reduction in drug use during the pretrial period. This in turn will cause the pretrial misconduct rate to decrease, under the assumption that drug use causes pretrial misconduct. The savings in pretrial misconduct will more than offset the costs of the program. In the second view, since pretrial misconduct is not caused by drug use (rather both are manifestations of the same underlying tendency), then the decrease in drug use due to monitoring will have no effect on the misconduct rate. Program costs clearly would not be justified in this case. In the third view, the drug monitoring itself will have no effect on drug use. In this

view, the tendency to take drugs overwhelms the fear of the consequences of failing in the monitoring program. Whatever relation exists between pretrial misconduct and drug use will thus be unaffected by the monitoring program. Finally, there is the possibility that the monitoring program itself will have adverse consequences for the pretrial misconduct rate. It is possible that the monitoring, or the fear of the sanctions in the monitoring program, will cause some defendants to flee who otherwise would have remained to face the consequences of their arrest.

The rival hypothesis then is that the testing procedures will have adverse consequences for the defendants in the program. After all, the periodic monitoring itself could cause some defendants to abscond since it is more restrictive than ordinary release. Whereas a defendant may be amenable to showing up in court for the original charge, he might be less willing, or unable, to come in twice a week to be tested. In this event, we would expect the FTA rate among the program group to be higher than the control group.

The design of the experiment will only allow study of the differences between the monitoring group and the nonmonitored group. If no difference is detected, it is possible that either the monitoring had no effect or that, because pretrial misconduct is not caused by drug use, the reduction in drug use in the monitoring group was unrelated to pretrial misconduct. Either an increase or decrease in

pretrial misconduct, on the other hand, have relatively straightforward interpretations. One exception, of course, is the circumstance in which it may be argued that the treatment was insufficiently intense or poorly delivered (i.e., that the monitoring was not rigorous or that the sanctions were insufficiently severe). Given that the pretrial service agencies, who are responsible for the sanction phase of the project, set the penalties as severely as believed possible in the pretrial setting (when, after all, defendants have as yet to be convicted on the current charge) suggests that this is at least a realistic test. Recalling that one underlying purpose to these projects is to reduce (or at least not increase) the jail populations, it would seem that the sanctions in these programs are reasonably good approximations to those that would be used in general.

I.2. Design Features. As suggested by these background issues, two main studies were undertaken as part of the evaluation program: 1) A study of the predictive validity of the drug test information for the problems of pretrial crime and failure to appear at trial; and 2) A drug monitoring experiment to assess the specific deterrent effects of the program to systematically test the pretrial population. Because these two studies have different sampling and analytical requirements, they are described separately below. For both parts of the study, special data collection

procedures have been designed and implemented by the Arizona Pretrial Services Agencies. In Pima County, a computerized case-tracking system created by the agency served as the base for the records of the defendants in the sample. This system allowed for the collection of a very large amount of information about each case, including prior record, court appearance history, offense, living arrangements, bail decision (release to Pretrial Services, bond, etc.), failure to appear, criminal behavior while on release, and so on (see sample data sheet in Appendix A). The files contained considerable richness and diversity of data about each case. These data were collected for all cases for both phases of the research described below.

In Maricopa County, the evaluation team, in consultation with staff of the pretrial services agency, designed a case coding form (see example in Appendix A). Data were collected from the computerized criminal history, from the pretrial services intake interview, from the agency's bail guidelines worksheets, from a printout of test results from the drug test contractor, and from the work folders of the drug monitoring project. In addition to the standard offense, personal history, and prior criminality variables, the evaluation staff included a series of self-reported drug use items in the pretrial services interview schedule.

II. PHASE I: DRUG TEST INFORMATION AS A TOOL FOR BAIL DECISIONMAKING.

This portion of the evaluation study is designed to answer the question of whether and to what extent verified drug use information adds to the task of predicting flight from scheduled court appearances and criminal activity during the pretrial period. This study required a relatively large and representative sample of defendants appearing for bail consideration, with extensive background data collected about each in order to model with multivariate statistics the correlates of the decisions. Furthermore, it required the ability to construct such models on cases about which drug test results are known to the evaluators but not to the decisionmakers. This latter condition allowed us to study a sample of defendants released prior to trial on ordinary conditions (i.e., the decision to release could not be affected by the drug test results). We could then measure the misconduct rates of the releasees and correlate them with the drug use information.

In each site, we sought to gather background information, drug test results, and pretrial conduct data from a sample of about 500 cases. The sample size was determined by amount of available resources for coding and analysis and by the requirements of the planned multivariate analyses. However, somewhat different sampling plans were

initiated in the two sites in an attempt to gather data
pertinent to as broad a range of questions as possible.

II.1. Pima County. We drew a sample of cases defined as all
individuals booked on felony charges in Pima County from
October to December, 1987, who agreed to a drug test
subsequent to an interview with the pretrial service staff
(N = 522) (in both sites the drug testing procedures are
voluntary, see site program descriptions in Appendix B).
Those defendants released prior to trial (N = 445) were
followed for a nine-month period to determine pretrial
misconduct. During the initial study period the testing was
accomplished and the results recorded but the test outcome
was not part of the recommendation to the court for
consideration of conditions of release. All other data,
including follow-up pertaining to appearance and pretrial
crime, were collected for these cases (as described above).

II.2. Maricopa County. In Maricopa County, data were
collected for a base-line sample of felony defendants,
arrested between October 13, 1988 and November 3, 1988.
Drug tests were given to all who consented, the results
recorded and the cases followed through the process for a
minimum of three months. The test outcomes were not
reported to the judges making the pretrial release decision.
Subsequent arrests and willful failures to appear were

recorded for the 311 persons released prior to trial. The
refusal rate was 15% during this period. Of the 311 persons
released, 8.7% had refused to take the test.

II. 3. Criterion variables.   Several procedures were used
to define pretrial misconduct.   Three criterion or "failure"
variables were defined: 1) if a warrant was issued for
failing to appear at a required court appearance (hereafter
referred to as FTA); 2) if the defendant was arrested for
offenses during the follow-up period (rearrest) and;
3) whether either an FTA or rearrest occurred (failure).
The central question for this phase of the study is whether
knowledge of drug test outcome has a significant (both
statistically and, given cost-benefit considerations,
substantively) predictive contribution to make over and
above the predictability of these phenomena with existing
information.

II.4. Results, Pima County.

     Tables 1 through 3 present descriptive data for the
initial Pima County sample. As shown in Table 1, the sample
was overwhelmingly male, about one-half minority, and
disproportionately young (64% age thirty or younger). A
sizable proportion were unemployed (37%) and few had
substantial monthly incomes (38% less than $300 per month).
In short, the sample reflects the characteristics of an
urban criminal court population.

TABLE 1

Demographic Characteristics of the Initial Pima County Sample

Characteristic			
Gender	Male	:	86.7% (of 445)
	Female	:	13.3%
Race	White	:	54.9% (of 443)
	Black	:	11.3%
	Hispanic	:	29.6%
	Other	:	4.3%
Age	18-20	:	15.4% (of 445)
	21-25	:	28.0%
	26-30	:	21.0%
	31-35	:	12.2%
	36-40	:	11.0%
	41-45	:	5.0%
	46-50	:	3.4%
	51-55	:	1.4%
	61-65	:	0.6%
	65 >	:	0.6%
Employment	Unemployed:		37.3% (of 437)
	Other:		62.7%
	Full-Time		
	Part-Time		
	Students		
	Retired		
Income (Monthly)	$ 0- 99		31.8% (of 377)
	100- 299		6.9%
	300- 599		18.8%
	600-1000		22.8%
	1000->		19.6%

TABLE 2

Drug Use In The Initial Pima County Sample

Type of Drug	Percent Testing Positive (N = 445)
Marijuana	41.6
Cocaine	29.0
Amphetamines	7.2
Barbiturates	1.8
Opiates	8.3
Any Drug Use	59.3

TABLE 3

Drug Use by Demographic Characteristic,
Initial Pima County Sample
(Percentage Testing Positive)

Demographic Characteristic		Marijuana	Cocaine	Amphetamines	Opiates	Any Drug Use
Gender:	Female	27.1	29.3	5.7	17.0	52.5
	Male	43.8	27.12	17.0	7.0	60.4
Race:	White	44.0	23.0	9.0	7.0	60.1
	Black	36.0	36.0	4.0	6.0	56.0
	Hispanic	37.4	37.4	4.5	11.5	58.0
	Other	52.6	26.3	10.5	10.5	68.4
Age:	18-20	45.1	28.2	8.5	4.2	59.2
	21-25	49.6	30.1	7.3	6.5	66.7
	26-30	55.3	35.1	5.3	9.6	68.1
	31-35	34.0	30.1	9.4	9.4	56.6
	36-40	26.0	22.0	8.0	16.0	52.0
	41 +	16.7	20.4	5.6	7.4	37.0
Monthly Income:	$ 0- 99	42.5	26.7	7.8	13.3	62.5
	100- 299	50.0	42.3	19.2	11.5	65.4
	300- 599	45.1	35.2	5.6	2.8	63.4
	600-1000	44.2	26.7	10.5	10.5	61.6
	1000->	36.5	28.4	5.4	2.7	55.4
Employment:	Unemployed	39.3	30.1	6.8	12.9	58.9
	Other	43.8	28.1	7.3	5.5	60.2

Table 2 displays the data concerning drug test results for the sample. Initially, the agency screened for five specific types of drug use--marijuana, cocaine, amphetamines, barbiturates, and opiates. (Marijuana was not used for the drug testing program subsequently, but was recorded in this part of the study.) As can be seen, 4 out of 10 defendants tested positively for marijuana, 3 out of 10 for cocaine, and less than 10 percent for other drugs. In all, nearly 60 percent of the sample tested positively for one or more of the screened drugs. Certainly this rate of drug use by the sample makes initially plausible the hypotheses of the drug testing program. Given the low prevalence of barbiturate use in the sample, it is dropped from further analysis. (The Pima pretrial services agency similarly stopped testing for barbiturates).

Table 3 presents cross-tabulations of some demographic and social background variables by drug test result. Males were somewhat more likely than females to test positively for "any drug" use, although males were more likely to test positively for marijuana and females for opiates. Large differences among the various ethnic groups are also not obvious, although slight preferences among drug types are apparent. The young are most likely to test positively for marijuana and cocaine, but not for opiates or amphetamines. Generally drug use declines with income for each drug.

TABLE 4

**Failure Variables by Positive Drug Test Result,
Initial Pima County Sample
(Percentage FTA, Pre-Trial Arrest, Failure)**

Drug	FTA	Pre-Trial Arrest	Failure
Total Sample (n = 445)	9.4	5.6	14.2
Marijuana (n = 185)	10.3	4.9	14.1
Cocaine (n = 129)	13.2	10.1	20.9
Amphetamines (n = 32)	6.3	6.3	12.5
Opiates (n = 37)	13.5	21.6	32.4
No Drug Use (n = 213)	8.3	3.9	11.6
Any Drug Use (n = 310)	10.2	6.8	15.9

Table 4 presents the first data relevant to the
hypothesis concerning drug use and pretrial misconduct--
cross-tabulations between drug test results and the various
pretrial misconduct variables. Overall, about 9 percent of
the sample failed to appear, six percent were rearrested
during the pretrial period and 15 percent were either
rearrested or failed to appear. These relatively low base-
rates cf failure indicate that substantial predictors of
misconduct will be difficult to develop (i.e., that
somewhere between 86 and 91 percent of the sample will be
successful on pretrial release as it is, a rate that leaves
very little room for improvement.) Overall, there are not
substantial differences between those who tested positively
for "any drug use" and those who tested negatively--roughly
equal proportions failed to appear and only slightly higher
proportions of drug users were rearrested (although the
pretrial rearrest rate for drug user is 50% greater than for
non-users, the percentages are only 6.8 and 3.9,
respectively).

Some differences in misconduct according to specific
drug test result are suggested in these data. Opiate users
may be worse risks than others (although their numbers are
so small that it may not be particularly useful to know
this) and cocaine users seem to fail more often than
marijuana users. With respect to FTA, both cocaine and
opiate users had rates about 50% higher than the average for

the sample. For pretrial arrest a similar finding is in evidence for cocaine and the rearrest rate for opiate users is three times the rate for the sample as a whole.

Clearly, these apparent effects of drug use on pretrial misconduct cannot be interpreted absent an understanding of the other correlates of misconduct and of the relationship among drug use items and other correlates of misconduct. Tables 5, 6, and 7 present data relevant to these considerations. In Table 5 the rates of pretrial misconduct are displayed according to demographic and social characteristics of the sample. With respect to FTA, males and females failed at about the same rate, white and "other" races failed more frequently than did blacks or hispanics, the unemployed failed more often than the employed, older defendants failed less than did younger defendants, and those with very low monthly incomes failed more frequently than those in other income groups. Although overall the arrest rates are low in this sample, males were rearrested more frequently than females and the young more frequently than older defendants.

Table 6 indicates that there are some fairly substantial relationships between prior criminal record variables and pretrial misconduct. Those with some law enforcement contact in the previous year failed to appear at trial 16 percent of the time and those with prior failures to appear failed to appear this time around 21 percent of

TABLE 5

Pretrial Misconduct by Demographic Characteristics,
Initial Pima County Sample

Demographic Characteristic		Total	FTA	Arrest	Failure
Gender:	Male	386	9	6	15
	Female	59	10	3	12
Race:	White	243	11	6	16
	Black	50	4	4	8
	Hispanic	131	8	6	15
	Other	19	11	0	11
Employment:					
	Unemployed	163	12	6	13
	Other	274	8	5	15
Age:	18-20	71	7	4	10
	21-25	123	9	7	15
	26-30	94	16	6	22
	31-35	53	9	6	15
	36-40	50	6	6	12
	41 +	54	6	2	6
Monthly Income:	$ 0- 99	120	12	6	16
	100- 299	26	0	4	4
	300- 599	71	6	8	14
	600-1000	86	10	6	15
	1000->	74	7	4	9

TABLE 6

Pretrial Misconduct by Criminal Record Variables,
Initial Pima County Sample
(Percentage)

Total Sample (n = 445)	FTA 9	Arrest 6	Failure 15
Law Enforcement Contact In Previous Year (n = 114)	16	8	22
Prior Criminal History (n = 234)	12	8	19
Prior FTA (n = 68)	21	10	29
Violent Offense Charge (n = 73)	4	0	4
Theft Offense Charge (n = 238)	14	8	20
Drug Offense Charge (n = 98)	9	6	14

the time. Those charged with violent offenses were less likely to fail to appear and those charged with theft offenses were more likely to fail to appear than other defendants. Rearrest rates were similarly associated with these criminal record variables; those with prior contact and those who had records of failing to appear were more likely to be arrested in the pretrial period than were other defendants. When the criterion shifts to either committing an FTA or being rearrested in the pretrial period, those with prior FTAs were twice as likely to fail as the sample as a whole, and about one defendant in five with a prior record failed.

These results indicate that, consistent with much previous research (Gottfredson, 1974; Goldkamp and Gottfredson, 1985) there are significant correlations between demographic, social and criminal justice system contact variables and the criteria of interest. This raises the possibility, discussed above in the section about the study's hypotheses, that the relationships discovered for drug use are consequences of the relation of drug use to prior criminal activity on the one hand and the relation of prior criminal activity to pretrial misconduct on the other. Table 7 presents data relevant to this hypothesis, by indicating the relationships between drug test results and the criminal justice system contact variables. The bottom row of Table 7 reveals the overall sample rates of

drug use, by type of drug. It can be seen that some criminal activity variables are related to the probability of testing positive for specific types of drug use. Most apparent is the relation between prior FTA and drug use; for every drug except amphetamines those with prior FTAs were more likely to test positively for drug use. Charge is also related to drug use, such that those charged with violent offenses were less likely and those charged with drug offenses more likely to test positively than the sample as a whole.

In order to investigate the independent contribution of drug test results to the problem of predicting pretrial misconduct, multivariate analyses were undertaken. The first step in this process involved specifying "best fitting models" for FTA, rearrest, and failure. The strongest predictors of pretrial misconduct were found by testing the same full model on FTA, rearrest, and failure. The full model contained twelve variables representing demographic, criminal history, and community attachment characteristics of offenders. The statistically significant variables from each full model were then used in a reduced model to predict pretrial misconduct (which are called the best fitting models below). The second step in this process then involved adding each drug test result to the best fitting model to see whether a positive drug test result could

TABLE 7

Drug Use by Criminal Record Variables, Initial Pima County Sample (In Percentages)

Court Record	Marijuana	Cocaine	Amphetamines	Opiates	Any Drug Use
Law Enforcement Contact in Previous Year	46	31	7	9	66
Prior Criminal History	45	32	6	9	64
Prior FTA	54	40	7	19	76
Violent Offense Charge	37	18	5	3	45
Theft Offense Charge	41	24	5	10	56
Drug Offense Charge	51	60	11	10	82
Sample Total	42	30	7	8	59

contribute to the further predictive power of the reduced model.

Table 8 displays the logistic regression results for the full model predicting FTA. Of the twelve predictors, only age (26 to 30 years old), theft charge, and drug charge have statistically significant effects. Consistent with prior research on FTA, all three factors predict higher chances of FTA. In other words, those offenders aged 26 to 30, or currently charged with a theft or drug offense were more likely to FTA. Table 9 presents both the parameter estimates and odds for the reduced model predicting FTA. The value of the odds show that offenders currently charged with a theft offense are the most likely to FTA, followed by offenders arrested on a drug charge, and offenders aged 26 to 30.

Table 10 shows the results from testing the full model against rearrest. Again, only three variables provide statistically significant effects--having phone service, prior FTAs, and theft charges. The results from testing the reduced model appear in Table 11. These results show that individuals with phone service are considerably less likely to be rearrested, while those offenders with any prior FTAs or currently charged with a theft offense are more likely to be rearrested.

Table 12 presents the full model results for failure. The variables of age 26 to 30 years, previous arrests, and

TABLE 8

Full Model Predicting FTA in First Tucson Sample

Parameter	Estimate	Standard Error
Intercept	-4.790	(0.818) *
Female	0.136	(0.529)
Age 21-25	0.201	(0.443)
Age 26-30	0.928	(0.418) *
White	0.411	(0.392)
Black	-0.667	(0.812)
Unemployed	0.590	(0.373)
Community Ties	-0.011	(0.477)
Phone	-0.020	(0.361)
Prior Record	0.465	(0.407)
Prior FTAs	0.526	(0.437)
Theft Charge	1.828	(0.557) *
Drug Charge	1.016	(0.594) *

-2 Log Likelihood = 231.335

* = $p \leq 0.05$ (one-tail t-test)

TABLE 9

Reduced Model Predicting FTA

Parameter	Estimate	Standard Error	Odds
Intercept	-4.092	(0.544)	
Age 26-30	0.936	(0.357)	2.550
Theft Charge	1.976	(0.533)	7.214
Drug Charge	1.216	(0.549)	3.374

-2 Log Likelihood = 254.417

TABLE 10

Full Model for Rearrest

Parameter	Estimate	Standard Error
Intercept	-6.403	(1.203)
Female	-0.291	(0.789)
Age 21-25	0.764	(0.506)
Age 26-30	0.526	(0.571)
White	0.398	(0.497)
Black	-0.227	(0.852)
Unemployed	0.009	(0.486)
Community Ties	0.667	(0.778)
Phone	-1.022	(0.507) *
Prior Record	0.869	(0.526) *
Prior FTAs	0.519	(0.526)
Theft Charge	1.400	(0.636) *
Drug Charge	1.071	(0.681)

-2 Log Likelihood = 163.102

* = $p \leq 0.05$ (one-tail t-test)

TABLE 11

Reduced Model for Rearrest

Parameter	Estimate	Standard Error	Odds
Intercept	-4.599	(0.658)	
Phone	-0.932	(0.487)	.394
Prior Record	0.981	(0.486)	2.667
Theft Charge	0.872	(0.465)	2.392

-2 Log Likelihood = 172.424

TABLE 12

Full Model for Failure

Parameter	Estimate	Standard Error
Intercept	-5.018	(0.748) *
Female	-0.070	(0.484)
Age 21-25	0.456	(0.367)
Age 26-30	1.035	(0.367) *
White	0.319	(0.333)
Black	-0.557	(0.615)
Unemployed	0.396	(0.322)
Community Ties	0.469	(0.458)
Phone	-0.415	(0.316)
Prior Record	0.691	(0.347) *
Prior FTAs	0.546	(0.372)
Theft Charge	1.792	(0.461) *
Drug Charge	1.086	(0.500) *

-2 Log Likelihood = 296.644

* = $p \leq 0.05$ (one-tail t-test)

charges of theft or drug offenses make statistically significant contributions to predicting failure. The results from testing the reduced model appear in Table 13. All four factors have substantial increases on the likelihood of failure, with a theft charge having an effect of the greatest magnitude, followed by drug charge, prior arrests, and age 26 to 30 years.

To test for the additional explanatory power of the drug test results, each specific drug test result was added to the best fitting model separately. In no instance did the addition of a single drug test result (i.e., for marijuana, cocaine, opiates, or amphetamines) make a statistically significant contribution to the fit of the reduced models' predictions of pretrial misconduct. Additionally, another variable representing positive test on any drug test was added to each of the best fitting models. Again, this variable also failed to prove statistically significant, once the best fitting models were controlled.

II.5 Results, Maricopa County.

The analyses of the base-line data for Maricopa County proceeded in much the same fashion as in Pima County. Tables 14-16 present some descriptive data on the released portion of the Maricopa sample. The sample defendants are overwhelmingly male (84%), largely white, non-minority (64%) and young (63% are 30 years old or younger). Nearly four in ten are unemployed. These descriptive data are very similar

TABLE 13

Reduced Model for Failure

Parameter	Estimate	Standard Error	Odds
Intercept	-4.056	(0.506)	
Age 26-30	0.782	(0.320)	2.186
Prior Record	0.853	(0.315)	2.347
Theft Charge	1.955	(0.453)	7.064
Drug Charge	1.326	(0.482)	3.766

-2 Log Likelihood = 314.337

TABLE 14

Demographic Characteristics of the
Initial Maricopa County Sample

Characteristic
_____

Gender		Male	:	83.5% (of 310)
		Female	:	16.5%
Race		White	:	63.5% (of 285)
		Black	:	22.8%
		Hispanic	:	12.6%
		Other	:	1.1%
Age		17-20	:	16.1% (of 310)
		21-25	:	25.2%
		26-30	:	22.2%
		31-35	:	13.3%
		36-40	:	11.9%
		41-45	:	5.5%
		46->	:	3.2%
Employment		Unemployed:		38.0% (of 297)
		Other:		62.0%
		Full-Time		
		Part-Time		
		Students		
		Retired		

to those for Pima County, with the exception that the hispanic population is somewhat greater in the Pima sample.

Table 15 describes the drug test results for the sample. (Unlike Pima County, Maricopa County did not screen for marijuana use; also, in Maricopa County, the project coded data on the refusal population, data that will be described below.) Overall, 46% tested positively for one or more drugs ("any drug use"), 35% for cocaine, and 16% for amphetamines. Other drugs, including opiates and PCP, were relatively infrequently uncovered (in fact, the small numbers testing positively for these other drugs inhibits their use in many of the subsequent analyses). Again, the similarity to the Pima sample is apparent--cocaine use predominates among the drug types (excluding marijuana) and the other forms of drugs are relatively rare.

As shown in Table 16, men were somewhat more likely than women to test positively for drugs. Among the ethnic groups, hispanics were notably more likely to test positively for any drug use (80% overall positive, principally due to cocaine; the base of this percentage is relatively small). Whites were most likely to test positively for amphetamines. Younger defendants were more likely than older defendants to test positively for each of the tested substances. The unemployed were somewhat more likely than those in jobs, schools or retirement to test

TABLE 15

Drug Use in the Initial Maricopa County Sample

Type of Drug	Percent Testing Positive (N – 235)
Cocaine	35.0%
Opiates	4.3
Amphetamines	15.8
Barbiturates	0.4
PCP	2.6
Any Drug Use	45.5

TABLE 16

Drug Use by Demographic Characteristic,
Initial Maricopa County Sample
(Percentage Testing Positive)

Demographic Characteristic		Cocaine	Opiates	Amphetamines	PCP	Any Drug Use
Gender:	Male	36.0	4.6	16.8	2.0	47.7
	Female	27.8	0.	11.1	5.6	32.4
Race:	White	29.4	4.4	23.5	0.7	44.5
	Black	35.3	5.9	5.9	3.9	39.2
	Hispanic	76.0	0.	0.	12 0	80.0
	Other	0.	0.	0.	0.	0.
Age:	17-20	31.6	0.	15.8	0.	39.5
	21-25	43.6	1.6	19.4	3.2	56.5
	26-30	53.9	9.6	15.4	7.7	61.5
	31-35	22.2	7.7	22.2	0.	40.7
	36-40	25.9	7.4	11.1	0.	32.1
	41 +	7.1	0.	7.1	0.	17.9
Employment:						
	Unemployed	43.0	5.8	11.6	1.2	50.6
	Other	31.7	3.5	18.3	3.5	43.7

positively. These basic relationships are quite similar to those uncovered for Pima County.

Table 17 describes some characteristics of the proportion of the released sample that refused to take the drug test. Ten percent of the male defendants refused the test, as did about that proportion of minority defendants. Those on probation or parole at the time of the arrest were substantially more likely to refuse the test, as were property-offense defendants and those arrested for robbery.

Table 18 presents the bivariate relationships between drug test result and the three failure variables used in the study. Overall the Maricopa sample had nearly a 25% FTA rate (as defined for the study), a 25% rearrest rate and a combined failure rate of 36%. Among defendants who tested positively for cocaine the failure rates are higher than among those not testing positively--32%, 35%, and 46 percent respectively. Although the number of defendants testing positively for opiates is small, these defendants too have considerably higher failure rates. Overall, defendants testing positively for any drug, as compared to defendants testing negatively for all drugs, had nearly twice the failure rates for each failure criterion. As with the Pima County defendants, these substantial bivariate relationships between testing positively for drug use and pretrial misconduct suggest the possibility that drug test result will be a useful indicator of pretrial

TABLE 17

Characteristics of Refusals,
Initial Maricopa County Sample

Characteristic	Percentage Refusing
Gender: Male	10
Female	0
Ethnicity:	
White	8
Black	11
Hispanic	11
Other	0
Age: 17-20	8
21-25	6
26-30	13
31-35	15
36-40	5
41+	3
Now on Probation or Parole:	
Yes	17
No	7
Property Offense:	
Yes	16
No	6
Robbery Offense:	
Yes	22
No	7

TABLE 18

Failure Variables by Positive Drug Test Result,
Initial Maricopa County Sample
(Percentage FTA, Pre-Trial Arrest, Failure)

Drug	FTA	Pre-Trial Arrest	Failure
Total Sample	24.5	25.2	36.5
Cocaine (n = 82)	31.7	35.4	46.3
Opiates (n = 10)	40.0	50.0	70.0
Amphetamines (n = 35)	27.0	29.7	40.5
No Drug Use (n = 177)	18.1	14.1	27.7
Any Drug Use (n = 107)	29.9	33.6	44.9

failure. Again, however, the important question is the independent information about pretrial risk supplied by the drug test.

Tables 19 and 20 address the question of the relationships between standard social, demographic and criminal history variables and the failure and drug test items. With respect to failure to appear, males and females failed at about the same rate, blacks failed more frequently than whites or hispanics, younger more frequently than older defendants, and the unemployed about as often as the employed. Nearly all of these groups were rearrested at about the same rate, except that hispanics, those between 20 and 30 years old and the employed were more frequently rearrested than their counterparts. With respect to the overall failure rate, these variables produce some moderately strong relationships--minorities are more likely to fail overall, as are the younger defendants.

Community ties variables (marital status, phone, living arraignments, and length of time at present address) are not particularly strongly related to the pretrial misconduct variables. With respect to FTA, there is little marital status difference, little difference according to whether the defendant lives alone or with others, or even with respect to length of time at the present address. On the other hand, those defendants with a telephone are considerably less likely to FTA than those without a phone.

TABLE 19

Pretrial Misconduct by Demographic Characteristics, Initial Maricopa County Sample

Demographic Characteristic		Total	FTA	Arrest	Failure
Gender:	Male	256	24.3	25.9	36.7
	Female	49	25.5	21.6	35.3
Race:	White	181	21.0	23.8	32.0
	Black	65	40.0	21.5	46.2
	Hispanic	36	25.0	41.7	50.0
	Other	3	0	0	0
Age:	17-20	51	33.3	23.5	37.2
	21-25	78	32.0	30.8	42.3
	26-30	69	21.7	27.5	37.7
	31-35	41	19.5	21.9	34.2
	36-40	37	13.5	21.6	27.0
	41 +	35	17.1	17.1	31.4
Employment:	Unemployed	113	25.6	19.5	35.4
	Other	184	23.9	27.7	36.4
Marital Status:	Single	209	23.4	27.3	36.4
	Married or Widowed	75	25.3	17.3	32.0
Telephone:	Yes	168	17.9	19.6	26.8
	No	113	32.7	33.6	48.7
Lives Alone:	No	229	26.2	25.3	37.1
	Yes	58	24.1	27.6	39.7

TABLE 19, Continued

Demographic Characteristic		Total	FTA	Arrest	Failure
Length of Time at Present Address:					
Less than 1 Week		13	15.4	30.8	30.8
1 Week to 1 Month		25	20.0	28.0	36.0
> 1 Month to 1 Year		125	26.4	21.6	36.8
> 1 Year to 5 Years		55	23.6	20.0	30.9
> 5 Years		55	20.0	30.9	32.7
Drug or Alcohol Treatment in Last 6 Months:					
	No	226	27.0	27.4	39.4
	Yes	52	15.4	15.4	23.1
Now on Probation or Parole:					
	No	270	24.8	24.4	33.3
	Yes	12	8.3	25.0	35.6
Refused Drug	No	284	22.5	23.6	34.2
Test	Yes	27	44.4	40.7	59.3

With respect to the rearrest criterion, single defendants and those without a phone are more likely to be rearrested than married defendants and defendants with phones.

The remaining portions of Table 19 present some conduct variables thought potentially useful for predicting pretrial misconduct. Defendants were asked whether they had been in a drug or alcohol treatment program within the previous six months. Whether they were on conditional liberty status at the time of arrest and whether they agreed to take the drug test were also noted. As can be seen, these variables have moderate relationships with pretrial misconduct. Those reporting involvement in treatment programs were less likely to FTA, were less likely to be arrested and were, overall, considerably less likely to fail. (This relationship may have interesting program significance--although more analyses would be required for confidence it is at least suggestive of a treatment effect). Those on conditional liberty were less likely to FTA, but were about equally likely to be arrested, than those not on probation or parole at the time of arrest. Finally with respect to Table 19, those who refused the drug test were considerably worse risks on all of the pretrial misconduct measures.

Table 20 demonstrates that in the Maricopa County sample there are important relationships between criminal record and offense type on the one hand and pretrial

TABLE 20

Pretrial Misconduct by Criminal Record Variable
Maricopa County Sample
(Percentage)

Total Sample	FTA	ARREST	FAILURE
(n - 311)	(24.4)	(25.2)	(39.4)
Computer Check of Prior Record (1+) (n - 107)	23.4%	33.6%	39.2%
Property Offense (n - 239)	28.4%	27.6%	40.6%
Robbery Offense (n - 9)	44.4%	44.4%	66.7%

misconduct on the other. Those with a prior record, those charged with property offenses and robbery were more likely to fail according to each of the three measures (although the number of robbery defendants is very small). Table 21 shows that these same criminal conduct variables are themselves related to the probability of testing positively for drug use. Thus, as was the case for the Pima County sample, caution must be exercised before concluding that drug test results provide a good independent marker of the probability of pretrial misconduct.

Tables 22 through 27 present the necessary multivariate analyses to disentangle the independent contribution of drug test results. The procedures followed here are the same as those described above for the Pima analyses. We first constructed the best model of pretrial misconduct (one for each failure criterion) using the available variables. Once a satisfactory model was constructed, we asked the question whether the drug test variables could add predictive power to the model. If so, we attempted to determine something of the magnitude of the independent contribution.

Turning first to the failure to appear criterion, the model selected estimated the probability of failing as a function of six variables (full model shown in Table 22, reduced model in Table 23). Having a phone and being young were negatively related to failure (i.e., were indicative of success). Those charged with property offenses, with

TABLE 21

Drug Use by Criminal Record Variable
Initial Maricopa County Sample
(Percentage)

Court Record	Cocaine	Opiate	Amphetamines	PCP	Any Drug Use
Computer Check of Prior Record (1+) (N - 71)	41.8	5.7	22.5	2.8	59.1
Property Offense (N - 184)	37.0	4.4	18.5	2.7	· 48.4
Robbery Offense (N - 7)	57.1	14.3	0	0	57.1

TABLE 22

Logistic Regression Results for the Full Model Predicting FTA, Maricopa County

Parameter	Estimate (s.e.)	
Intercept	-2.379 (1.201)	*
Female	0.154 (0.385)	
Phone	-1.100 (0.349)	***
Age $\geq$ 26	-0.682 (0.333)	*
Unemployed	-0.281 (0.318)	
Married	0.168 (0.368)	
Risk Group	0.145 (0.302)	
Probation or Parole	-0.491 (0.374)	
Property Offense	1.622 (0.576)	**
Robbery Offense	1.897 (0.898)	*
Prior FTAs	0.828 (0.485)	
Alcohol Treatment	-.0541 (0.695)	
Live Alone	-0.361 (0.494)	
Length at Address	-0.014 (0.130)	
Computer Check on No. of Prior Arrests	0.020 (0.123)	
White	0.759 (0.676)	
Black	0.945 (0.765)	
Hispanic	1.680 (0.703)	**
Self-Reported Drug Treatment	0.624 (0.322)	*

  * $p \leq 0.05$
 ** $p \leq 0.01$
*** $p \leq 0.001$

   Log-Likelihood = -146.90

TABLE 23

Logit Analysis For Best Fitting Model
For Failure to Appear

Initial Maricopa County Sample
(N - 208)

Parameter	Estimate	Standard Error	Odds
Intercept	. -1.73	0.67	
Phone	-1.06	0.30	.346
Age	-0.63	0.32	.533
Property Offense	1.45	0.48	4.263
Self-Reported Drug Treatment	0.35	0.25	1.419
Robbery Offense	1.84	0.84	6.297
Hispanic	0.97	0.32	2.638

-2 Log Likelihood - 301.24

All coefficients significant at the 0.1 level.

robbery offenses, hispanics and those recently in drug
treatment programs were more likely to fail to appear,
considering the variables in Table 22 at the same time. The
outcome of each drug test (i.e., for cocaine, for PCP) was
tested for its independent contribution to this model, as
was the variable "any positive test". None were able to
contribute to the model at conventional levels of
significance. Although the sample is not large, the
consistency with the Pima County results is substantial,
lending support to the inference that drug test results do
not add substantially to the ability to estimate the
probability of failure to appear.

For the rearrest criterion, the results are somewhat
different (Table 24 for the full model, Table 25 for the
reduced model). Again, the best model of failure was
constructed using available background variables. The first
six variables in Table 25 constituted this model. Then,
each of the drug test variables was added to the model to
determine whether it could make a substantial contribution
to explaining rearrest. In this case, testing positively
did make a contribution at conventional levels of confidence
(p=0.045), a contribution due to the effect of cocaine (the
other drug tests did not make significant contributions).
The contribution is, however, relatively modest.

The results for this rearrest criterion carry over to
the general failure model (full model in Table 26, reduced

TABLE 24

Logistic Regression Results for the Full Model Predicting Rearrest in Phoenix

Parameter	Estimate (s.e.)
Intercept	-1.380 (1.109)
Female	-0.243 (0.400)
Phone	-1.032 (0.349) **
Age $\geq$ 26	-0.308 (0.317)
Unemployed	-0.756 (0.328) **
Married	0.528 (0.385)
Risk Group	0.238 (0.268)
Probation or Parole	-0.562 (0.360)
Property Offense	1.116 (0.496) *
Robbery Offense	1.405 (0.875)
Prior FTAs	0.712 (0.445)
Alcohol Treatment	-.0165 (0.592)
Live Alone	-0.413 (0.467)
Length at Address	-0.105 (0.132)
Computer Check on No. of Prior Arrests	0.324 (0.108) **
White	0.143 (0.543)
Black	1.153 (0.627)
Hispanic	0.058 (0.604)
Self-Reported Drug Treatment	0.461 (0.312)

* $p \leq 0.05$
** $p \leq 0.01$

Log-Likelihood = -152.09

TABLE 25

Logit Analysis For Best Fitting Model
For Re-Arrest

Initial Maricopa County Sample
(N — 217)

Parameter	Estimate	Standard Error	Odds
Intercept	-1.67	0.40	
Phone	-0.94	0.29	.391
Unemployed	-0.85	0.32	.427
Property Offense	0.99	0.40	2.691
Robbery Offense	1.33	0.75	3.781
Computer Check of Prior Arrests	0.26	0.10	1.297
Black	0.79	0.41	2.203
Cocaine	0.63	0.32	1.878

-2 Log Likelihood — 311.96

All coefficients significant at the 0.10 level.

Table 26

Logistic Regression Results for the Full Model
Predicting Failure in Phoenix

Parameter	Estimate (s.e.)	
Intercept	-1.697 (1.014)	
Female	-0.004 (0.352)	
Phone	-1.195 (0.319)	***
Age $\geq$ 26	-0.251 (0.286)	
Unemployed	-0.429 (0.291)	
Married	0.179 (0.333)	
Risk Group	0.334 (0.253)	
Probation or Parole	-0.572 (0.331)	
Property Offense	1.384 (0.471)	**
Robbery Offense	1.924 (0.852)	**
Prior FTAs	0.815 (0.416)	*
Alcohol Treatment	-.0293 (0.554)	
Live Alone	-0.507 (0.432)	
Length at Address	-0.007 (0.117)	
Computer Check on No. of Prior Arrests	0.179 (0.104)	
White	0.321 (0.512)	
Black	1.192 (0.602)	*
Hispanic	0.914 (0.551)	
Self-Reported Drug Treatment	0.588 (0.282)	

* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

-2 Log-Likelihood = 355.44

model in Table 27). Here the variable, number of positive tests, reaches statistical significance at the 0.1, but not at the 0 .05 level of confidence. The substantive significance is again modest.

As is clear from these tables, we were able to establish a role for the drug test results only at a low level, and only for rearrest, once items of information routinely collected by the pretrial agency were taken into consideration. These results are similar to those discovered in Pima County, lending some sense of reliability to them. Apparently, despite the generally moderate relation to pretrial misconduct at the bivariate level, drug test results do not add substantially to the ability to predict pretrial misconduct in Arizona. The exception is that testing positively for cocaine may be, within the context of these analyses, independently but modestly, related to rearrest.

There is a possibility, raised by Smith et al. (1989), that when only released offenders make up the sample of offenders studied for FTA or rearrest this sample selection will bias the results. That is, it is likely that the decisions to release offenders will be based on characteristics also related to probabilities of FTA, rearrest, or failure. To answer this issue the release decision was modelled as a function of gender, marital status, living arrangement, current charge (property),

TABLE 27

Logit Analysis For Best Fitting Model
For Failure

Initial Maricopa County Sample
(N = 198)

Parameter	Estimate	Standard Error	Odds
Intercept			
Phone	-1.15	.27	.317
Property Offense	1.54	.42	4.664
Robbery Offense	2.17	0.83	8.758
Probation or Parole	-0.72	0.29	.487
Number of Positive Tests	0.46	0.27	1.584
Black	0.69	0.41	1.994
Hispanic	0.55	0.32	1.733
Self-Reported Drug Treatment	0.57	0.26	1.768

-2 Log-Likelihood = 355.46

All coefficients significant at the 0.10 level;

Drug Tests significant at 0.09.

whether the defendant was on probation or parole, and number of prior arrests, consistent with other work on this topic (see Goldkamp and Gottfredson, 1985).

Table 28 displays the logistic regression results for this model on the entire sample. Then, following Berk's (1983) discussion on testing for sample selection bias, each individual offender was assigned a probability of release based on their scores for the independent variables.

This probability value, referred to as the "hazard rate," was then included as an independent variable to each of the reduced models predicting FTA, rearrest, and failure. In other words, using the reduced models discussed above, the hazard rate was added as an additional variable. Tables 29, 30, and 31 display the logistic regression results obtained by including this extra variable.

Clearly, Tables 29 through 31 demonstrate that selection bias has not altered the results displayed earlier. The hazard rate fails to reach statistical significance in all three cases, implying that the released offenders do not represent a unique population with unique correlates of FTA, rearrest, and failure.

Another issue to be addressed by sample selection bias techniques is whether the inclusion of the hazard rate can alter the statistical significance of the drug test results when both are added to the reduced models. As discussed above, only cocaine has a statistically significant effect

Table 28

Logistic Regression Results for the
Maricopa Release Model

Parameter	Estimate (s.e.)
Intercept	-1.072 (0.517) *
Female	1.149 (0.397) ***
Married	0.511 (0.299)
Live Alone	-0.921 (0.259) ***
Probation or Parole	0.358 (0.163) *
Property Offense	0.785 (0.249) ***
Computer Check on Number of Prior Arrests	-0.390 (0.070) ***

  *   p ≤ 0.05
 **   p ≤ 0.01
*** P ≤ 0.001

-2 Log-Likelihood = 501.40

Table 29

Reduced Model Predicting FTA Controlling for Sample Selection Bias, Maricopa

Parameter	Estimate (s.e.)
Intercept	-1.570 (0.819) *
Phone	-1.069 (0.301) ***
Age $\geq$ 26	-0.632 (0.317) *
Property Offense	1.384 (0.517) **
Robbery Offense	1.834 (0.842) *
Prior FTAs	0.628 (0.386)
Hispanic	0.976 (0.325) **
Self-Reported Drug Treatment	0.349 (0.246)
(Hazard Rate)	-0.209 (0.628)

  * p $\leq$ 0.05
 ** p $\leq$ 0.01
*** p $\leq$ 0.001

-2 Log-Likelihood = 301.12

Table 30

Reduced Model Predicting Rearrest Controlling for Sample Selection Bias, Maricopa

Parameter	Estimate (s.e.)
Intercept	-2.124 (0.642) ***
Phone	-0.842 (0.294) **
Unemployed	-0.747 (0.312) **
Property Offense	1.255 (0.462) **
Robbery Offense	1.480 (0.754) *
Computer Check on Number of Prior Arrests	0.175 (0.140)
Black	0.987 (0.396) **
(Hazard Rate)	-0.747 (0.795)

  * p ≤ 0.05
 ** p ≤ 0.01
*** p ≤ 0.001

-2 Log-Likelihood = 315.00

Table 31

Reduced Model Predicting Failure Controlling
for Sample Selection Bias,
Maricopa

Parameter	Estimate (s.e.)	
Intercept	-1.194 (0.756)	
Phone	-1.132 (0.274)	***
Property Offense	1.561 (0.450)	***
Robbery Offense	2.203 (0.819)	**
Probation or Parole	-0.705 (0.307)	*
Prior FTAs	0.534 (0.350)	
Computer Check on Number of Prior Arrests	0.184 (0.147)	
Black	0.795 (0.398)	*
Hispanic	0.543 (0.314)	*
Self-Reported Drug Treatment	0.567 (0.258)	*
(Hazard Rate)	-0.080 (0.813)	

-2 Log-Likelihood = 355.44

* $\leq$ 0.05 (one-tail t-test)
** $\leq$ 0.01 (one-tail t-test)
*** < 0.001 (one-tail t-test)

on rearrest. Otherwise, drug test results have very little predictive validity for any measure of failure.

When the hazard rate was included with each reduced model and one drug test result, an identical pattern of results was obtained. Again, in no case was the hazard rate statistically significant, so the models discussed above remain unchanged. Further, the failure of the hazard rate to make an additional, statistically significant, contribution implies that using only the released sample of offenders to model FTA, rearrest, and failure is not problematic.

This analytical procedure is not designed to be a full causal analysis of the problem of pretrial misconduct. Rather, the aim was to determine, from a pragmatic point of view, whether knowledge of drug test outcome helps predict pretrial misconduct in a meaningful fashion. The burden in these analyses was placed upon the variables representing drug test outcomes. This seems reasonable, given that the prior criminal history information is routinely available to assist in this decision and that the drug test information can be added only with additional cost. Thus, although drug test results are related to pretrial misconduct, these results suggest that knowledge of drug test result does not substantially assist the task of predicting pretrial misconduct in Arizona.

III. STUDY II: EXPERIMENTAL ANALYSES OF ARIZONA DRUG
MONITORING PROGRAMS.

As described above, one of the most important evaluation questions concerning drug testing of the pretrial population concerns whether or not periodic testing of the pretrial population will change their drug use tendencies such that there will be a reduction in other pretrial misconduct, such as failure to appear and pretrial arrests. This phase of the evaluation of the Arizona program is designed to provide answers to these questions.

The complete descriptions of the drug monitoring programs in Pima and Maricopa Counties are attached to this report as Appendix B. This appendix is written by the projects and submitted to the Bureau of Justice Assistance as part of the funding requirements. Prior to the implementation of the programs, the plans, including the sanctioning mechanisms, were subject to the approval of the Pretrial Services Resource Center, the agency providing technical assistance to the programs.

As will be clear from a reading of these program descriptions, both sites undertook substantial pre-program planning and staff training and both produced impressive and detailed procedure manuals. Only the sanctioning features of the monitoring programs will be discussed here; interested readers are referred to the appendices for details concerning specimen collection, chain of custody

concerns, laboratory procedures, confidentiality, and other programmatic issues.

III.1.Pima County.

All positive urinalysis tests were to be reported to the court, the prosecuting attorney, and the defense attorney. Subsequent to the first positive test, a verbal warning was to be issued outlining the consequences of further failure to comply. Subsequent to the second positive test, a written warning was to be issued and placed in the file. The third positive test was to result in a referral to a substance abuse center with the admonition that failure to comply with the requirements of the substance abuse center will result in a petition to the court to review the release conditions. Upon completion of the substance abuse program evaluation, release conditions were to be modified in accordance with the treatment plan; sanctions were suspended for up to 30 days while the defendant was in treatment. If the defendant tested positively subsequent to the treatment, a petition to review release conditions was to be filed.

Unexcused failures to provide specimens also resulted in sanctions. After the first, the defendant was to be issued a verbal warning. After the second, the defendant was to be issued a written warning that the next failure would result in notice given to the court. A petition to review was to follow the third failure.

III.2 Maricopa County. All felony arrestees booked into the central jail facility were given a urine test for drug use on a voluntary basis (consent forms were used). Persons with a positive test (and those persons court-ordered to test at the initial appearance as a condition of pretrial release who test positive), were assigned to the monitoring program (for details of the experimental procedures, see below). Defendants were ordered to test for drug usage two times weekly. If the defendant tested negatively on three consecutive occasions, the defendant was to be put on a random schedule fixed by the agency contracting for the testing. Those testing positively at any time were again to be placed on the fixed schedule. In addition to the drug monitoring, each defendant was to be supervised by telephone and personal contacts in the normal manner.

Sanctions for non-compliance with the testing program increased in severity with increased non-compliance. Testing positively and unexcused failures to appear for testing were to be treated as non-compliance. Subsequent to the first non-compliance defendants were to receive a verbal warning. For the second failure, if the failures were non-consecutive, the testing schedule was to be escalated from random to scheduled. If the failures were consecutive a written warning was to be issued and the warning was to be included in the performance file. Subsequent to a third

consecutive failure the court was to be petitioned to revoke the defendant's release. The performance report was to be submitted to the court for defendants adjudicated guilty.

III.3. Results, Pima County. On a random basis (the booking number was used as a reasonable approximation to randomness and every third case was assigned to the control group) a sample of pretrial supervised releasees who would otherwise be assigned to the periodic drug testing program were supervised in the normal fashion without periodic drug testing. We sought to make this sample as large as practical to permit identification of effects of special deterrence to the extent they exist. Assignment into control group conditions lasted as long as the agency thought feasible; ultimately the agency asked that we stop due to its interference with orderly operations of supervision. This resulted in 222 valid cases for the experiment. Although 619 cases were assigned during the period of May through October, 1988, there was substantial attrition due to the "non-file" rate of the County Attorney's office (i.e., 43% of the time the case was not prosecuted). These cases, because they are removed from the criminal justice system, are out of the scope of the program. Additionally, individuals were allowed to be assigned to the test samples only once---those individuals who appeared more than once during the study were only included on the first occasion

(i.e., individuals were only allowed to contribute to the treatment findings once).

Because of concerns that the sample size might be too small to detect significant treatment effects should they occur, a supplemental sample was collected for the three month period, April to June, 1989. The data will be reported in both disaggregated and in aggregated form throughout this report. It should be kept in mind, however, that the initial experimental sample included all relevant cases for a five month period in the jurisdiction--it is therefore reasonable to evaluate the substantive significance of this program on the basis of this first sample, even though it does indeed have a relatively small number of cases, since by using it 42% of the year's cases are part of the evaluation.

All case tracking data, including failure to appear and arrest for new crimes in the pretrial period, were collected for both the "treatment group" (those given the periodic drug monitoring tests), and the control group (those otherwise situated but chosen on a random basis not to be tested).

As noted above, this design allowed for study of the relation between program participation and absconding and rearrest. It also allowed exploration of the hypotheses about how drug use is connected to criminal behavior. To the extent special deterrence for the testing is

established, then our observations of the criminal conduct
of those specially deterred will be valuable: if nondrug
offenses in the specially deterred group increase, the
displacement hypothesis (drug use offenses that are deterred
by the program become displaced to other offenses) will gain
support. If nondrug offenses decrease in the treatment
group, it suggests that drug use and its pursuit causes
other crimes. If the arrest rate among the control group is
higher, or if the failure to appear rate is higher, it will
suggest that the fear of drug monitoring can increase
compliance with the law generally.

As shown in Table 32, a limited test of whether the
design resulted in random assignment, there are no
substantial differences (a generous probability level should
be used in this case) between the groups on significant
background variables (i.e., background variables that may be
associated with the criterion variables). These data give
no reason to suspect other than random assignment by the
project.

Between-group analyses against the several criteria
were used to evaluate the hypothesis that the treatment had
special deterrent value, using conventional levels of
confidence. These results are shown in the first panel on
Table 33. The means, standard deviations and significance
levels are displayed for the rearrest, failure to appear and
combined failure criteria. With respect to the FTA measure,

TABLE 32

Background Variables in Treatment
and Control Samples,
Pima County Study

Variable	Treatment Mean N - 153[1]	Control Mean N - 78	t
Age	29.05	29.62	0.59
Prior Violent Charge	0.42	0.55	0.77
Prior Property Charge	1.10	1.14	0.13
Prior Drug Charge	1.31	1.33	0.08
Prior Failures to Appear	0.59	0.40	0.70
Number of Positive Tests	1.51	1.51	0.06
Number of Females	0.19	0.24	0.93
Drug Charge	0.01	0.03	0.62
Number of Different Drugs	0.91	0.93	0.57
Phone	0.68	0.65	0.51
Community Ties	0.88	0.91	0.90

[1] Note: N's vary slightly due to missing information
on some background variables.

the rate for the monitored group was 10% and for the
unmonitored group it was 15%, a difference that does not
reach significance at conventional levels of confidence
(p=.33). With respect to the rearrest criterion, 4% of the
monitored group compared to 12% of the control group were
rearrested, a difference that nearly reaches significance at
conventional levels of confidence (p=.06). Given the sample
size, it is reasonable to infer that there is a reliable
difference between the groups on this measure. The effect,
however, is due entirely to rearrests for drug possession
offenses. Of the 15 rearrests in the sample, nine were for
unlawful possession of drugs. When these offenses are
removed from the failure measure (shown in Table 33 as "non-
drug rearrests") there is not a reasonable basis for
inferring a difference in offending between the two groups
(t=.82, p=.41). The combined failure measure (all rearrests
and FTAs) reflects these findings, indicating a small, but
non-sighificant difference between the experimental and
control groups. Thus, this first experimental study
suggests that the monitoring program may, at best, reduce
the drug taking behavior of the defendants who are under the
monitoring program, while not substantially affecting other
offending behaviors.

As noted above, in order to increase the sample size
and reliability of the findings for the Pima County study we
undertook another experimental study, including random

allocation into the monitoring and a control group (this time in equal proportions). This study took place several months after the initial study and was accomplished during a three month period (April to June, 1989) and a ten-month follow-up. During this period, the pretrial services agency interviewed 264 felony cases. Deleting those not released prior to trial and those not subsequently charged resulted in a within-scope sample of 136 cases, 72 in the monitoring group and 64 in the control group. A study of the characteristics of the two samples indicated no substantial differences in a wide variety of background characteristics, with the exception that the control group had somewhat higher incomes than the monitored group. No differences were noted for prior FTAs, age, drug test results, community ties, or prior record. Only FTA data were available in the follow-up portion of this supplemental study.

Table 33 shows FTA statistics for the two groups in the second sample. Also shown are the FTA rates and the t statistics for difference, for the two samples combined. As can be seen, the experimental and control groups did not differ in the second sample on FTA (the monitored group has a slightly higher rate than the control group). As a consequence of this, and of the lack of significance in the first study as well, the combined samples show no significant difference in FTA rates. Thus whether the

TABLE 33

Pretrial Misconduct by Treatment Status, Means,
and (Standard Deviations),
Pima County Study

Variable	Drug Monitored Group N = 153	Control Group N = 78	t (Probability)
First Sample:			
Pretrial Rearrest	.04 (.19)	.12 (.32)	1.92 (.06)
Non-Drug Rearrest	.02 (.14)	.04 (.20)	-.82 (.41)
Failure to Appear	.10 (.30)	.15 (.36)	.98 (.33)
Combined Failure	.15 (.36)	.18 (.38)	.50 (.62)
Second Sample:	N = 72	N = 64	
Failure to Appear	.14	.11	0.52 (.60)
Combined Samples:	N = 225	N = 142	
Failure to Appear	.11	.13	-0.46 (.64)

second sample is seen as a replication or as part of the same study, the conclusion of no difference is the same.

The Monitoring Program. The project plan for the drug monitoring was described above. We undertook some analyses of the implementation of the experimental conditions, in order to ascertain something of the nature of the treatment actually delivered to the experimental group.

Table 34 displays the drug testing experience of the 153 members of the first experimental group. Although all of the members of this group were to be on the testing schedule, the data indicate that 30 were not drug tested during the period (15 of these cases failed to appear or were rearrested, subsequent to assignment to the monitoring program but before testing could begin). The testing experience of the remaining subjects was quite variable, ranging from one test (5 subjects) to 39 tests (1 subject). There is a trend for the proportion of subjects who test positive to increase with increasing number of tests.

As indicated, 30 subjects, or 20% of the sample did not receive a monitoring test. Fourty-five subjects, or 29% of the sample did not test positively during the monitoring period; 18% tested positively once, 6% twice, 5% three times, 8% between 4 and 6 times, 10% between 7 to 9 times, and 4% over 10 times. One subject tested positively 20 times.

TABLE 34

Number of Drug Monitoring Tests and Percent Testing Positive, Pima County Experimental Group

Number of Tests	Number of Subjects	Percent Positive	Number of Tests	Number of Subjects	Percent Positive
1	123	11	21	23	22
2	118	19	22	23	13
3	113	17	23	21	38
4	110	17	24	18	17
5	105	16	25	15	33
6	101	16	26	14	21
7	96	14	27	12	33
8	91	10	28	9	22
9	91	11	29	7	28
10	87	15	30	5	20
11	78	12	31	4	75
12	69	16	32	4	50
13	65	25	33	4	75
14	55	25	34	3	100
15	50	20	35	2	100
16	44	27	36	1	100
17	36	26	37	1	100
18	35	20	38	1	100
19	29	14	39	1	100
20	24	21			

The relationship between testing positively (or not testing at all) and pretrial misconduct during the monitoring period is complex. As indicated above, those not testing had very substantial failure rates (50% FTA or rearrest). Among those who never tested positively, none were rearrested and 4 (9%) were FTA. There was only one (4%) FTA in the group with one positive test and no rearrests. Among those with two positive tests, there were two FTAs and one rearrest. For those with three to five positive tests, there were two FTAs and one rearrest. In the six to nine group, there were four FTAs and three rearrests. In the ten to 20 positive test group (n=6) there were no rearrests and no FTAs.

In all, there were nine instances in the experimental group in which the pretrial services agency petitioned the court for a review of the conditions of release (the highest sanction available in the program). However, only six of these were independent of a rearrest and thus solely attributable to program misconduct. These six revocations are spread evenly throughout the distribution of number of positive tests.

III.4 Results, Maricopa County. The design of the experimental study in Maricopa County was identical to that in Pima County (see Appendix B for the project monitoring plan in Maricopa). Cases were assigned on the basis of

booking numbers, with the odd numbered cases entering the monitoring program and the even numbered cases going into the control group. This procedure was assumed to approximate a random assignment and facilitated administration of the process. Again, the very high rate (in excess of 60% during the period) of nonfiling by the County Attorney (i.e., the case is dropped from the criminal justice system and as a consequence from the proper scope of the drug testing program) resulted in substantially fewer cases than expected on the basis of projected case-flow alone. This extended the period of study much longer than expected in order to have sufficient numbers of cases for reliable results.

The proposed design called for the control group to receive "normal treatment" during the course of the follow-up period. This meant that whatever the expected assignment for release conditions, other than drug monitoring, was to be the assignment implemented (i.e., supervised release, other treatment programs). However a different control group was actually implemented--all defendants received straight release on recognizance. Although this was in many respects a better test of the effect of the monitoring program (comparing its effectiveness with the least restrictive alternative), it was not the designed test (and, if it turned out to be the case that a significant effect was found for the drug monitoring program, it could be

argued that such an effect might not be larger than that
obtainable under "normal practice"). Consequently, we were
again forced to implement a two-stage experimental design.
We allowed this first phase to run until sufficient cases
were available for study (about 200) and then implemented
the designed control group study. Preliminary results from
the second study will be reported later in this report.

Preliminary analyses of the data indicated that some
non-random assignment had been used by the site. On the
basis of discussions with the program personnel, it was
discovered that one category of case had been automatically
placed in the treatment group; this small group consisted of
cases refusing to test at the initial appearance and who
failed to show up for the required initial testing by the
contractor. These cases were identified and removed from
the analysis.

Some information concerning the similarity of the two
samples is presented in Table 35. The two groups did not
differ, at reasonable (and generous) levels of confidence,
according to a wide range of demographic, offense and prior
record variables, lending some confidence to the
randomization procedure. They did differ, however, on two
potentially important dimensions--the proportion who refused
to take the initial drug test and the proportion self-
reporting a treatment program for drug addiction. In the
case of the refusals, three percent of the treatment cases

TABLE 35

Background Variables in Treatment
and Control Sample,
Maricopa County Study

VARIABLE	TREATMENT Mean N - 118	CONTROL Mean N - 116	t
Sex	1.24	1.26	-0.34
Ethnicity	1.66	1.67	0.05
Age	27.83	27.96	-0.14
Length at Address	3.44	3.46	-0.22
On Probation or Parole	1.96	1.98	-0.72
Prior Drug, Alcohol or Physical Treatment	1.81	1.82	-0.18
Prior Convictions	0.90	1.07	-0.89
Charge Severity	2.74	2.78	-0.32
Property Offense	0.93	0.95	-0.50
Refuse	0.03	0.09	-1.81**
Treatment for Drug Addiction	0.12	0.00	3.82**

** Significant at the .10 level.

Note: N's vary slightly from variable to variable
       due to missing cases.

and nine percent of the control cases were individuals who
had initially refused (or were unable to provided as sample)
at the initial appearance. Because refusals were
substantially more likely to be failures during the pretrial
period, this difference favors the monitoring group. Thus,
in this case it is likely that whatever bias has been
introduced by non-random assignment, if any, would make the
drug treatment seem more effective than it actually is. The
"treatment for drug addiction" variable is created on the
basis of a self-report on the defendant during the pretrial
services interview. In this case the difference between the
experimental and control conditions is more striking--12
percent of the monitoring group, but none of the control
group, reported previous treatment for drug addiction. It
appears that there was systematic assignment of these cases
to the monitoring group. The bivariate relationship between
self-reported treatment for drug addiction and failure is
large enough to cause concern. For example, 18% of those
who did not self-report such treatment in the base-line
study were rearrested as compared to 32% who did report such
treatment (chi-square of 2.77 on 1 df, p=0.096). On the
other hand, the FTA rates are similar for these groups (17%
versus 12%), with the difference favoring the treated group
(chi square of 0.562 on 1 df, p=0.454). It is therefore
ambiguous as to the extent of the potential bias introduced
by this assignment. (One difference apparently favors the

monitored group, the other the control group.) As a consequence, we will report the results with these cases added to and subtracted from the treatment sample. Follow-up procedures were the same as those described above for the base-line study.

Table 36 presents, under the heading "First Study", the group means, standard deviations and t statistics for the three failure variables. As can be seen, none of the comparisons are significant at conventional levels of confidence (and since, as discussed above, any bias in the assignment of cases may have operated to raise the misconduct rates of the control group, the impression of "no difference" is justified). The rearrest rates were essentially identical; the control group had an 8% higher FTA rate and, as a consequence, a 6% higher combined failure rate, but this difference only approached statistical significance, Arguably with a larger sample size, and assuming such differences maintained, these could be seen as differences favoring the monitoring program. However even under these conditions the differences would have to be considered modest FTA differences. The rearrest finding is less ambiguous.

In the second panel of Table 36 the cases in which the defendant self-reported addiction treatment have been removed from consideration. None of the comparisons reach significance at conventional levels. The rearrest rates for

TABLE 36

Pretrial Misconduct by Treatment Status, Means and (Standard Deviations), Maricopa County Study

FIRST STUDY:

	Drug Monitored Group (N = 118)	Control Group (N = 116)	t (Probability)
Pretrial Rearrest	.25 (.43)	.24 (.43)	0.08 (.94)
Failure to Appear	.30 (.46)	.38 (.49)	-1.47 (.14)
Combined Failure	.37 (.43)	.43 (.50)	0.90 (.36)

Self-Reported Addiction Cases Removed

	N = 105	N = 116	
Pretrial Rearrest	.22 (.43)	.24 (.43)	-0.39 (.94)
Failure to Appear	.29 (.45)	.39 (.49)	-1.61 (.11)
Combined Failure	.35 (.48)	.43 (.50)	-1.20 (.23)

SECOND STUDY:

	Drug Monitored Group (N = 425)	Control Group (N = 465)	t (Probability)
Pretrial Rearrest	.45 (.50)	.37 (.48)	2.26 (0.024)
Failure to Appear	.35 (.48)	.27 (.45)	2.35 (.019)
Combined Failure	.58 (.49)	.47 (.50)	3.43 (.001)

the two groups are very similar, although the FTA rates indicate a ten percentage point difference, approaching significance, in favor of the monitored group. The combined failure criterion suggests an eight percent difference favoring the monitored group, with a probability of achieving such a result by chance alone of 20%. Taken together, it seems most reasonable to conclude that the monitoring program in Maricopa County lacked effectiveness for preventing rearrests and probably lacked effectiveness for preventing FTAs.

This conclusion may be all the more striking when it is recalled that the comparison group involved release on recognizance, the least supervision possible. The rearrest rates are in fact comparable to those of the base-line group (about 25% of every group was rearrested) and the FTA rates are somewhat higher in both the monitoring and the control groups than in the base-line study.

We are able to report preliminary data from the second experimental study, also reported in Table 36, under the heading "Second Study". Although we hope to report further on these data in a subsequent report, we have undertaken randomization checks (and find no significant differences on a wide range of background variables with the important exception of the proportion in each group testing positive at initial appearance--ten percent more tested positive in the treatment group as opposed to the control group,

suggesting some differential assignment). The groups available for analysis are substantially larger than in our other experiments, and the control group condition involved ordinary assignment to supervision or ROR release, as currently practed by the court. Thus this control condition allows for the comparison of the drug monitoring treatment with ordinary practice.

As can be seen on Table 36 all of the differences between the treatment and control groups are significant at conventional levels of probability (for two tailed tests) and in the direction contrary to the hypothesis of effectiveness of the monitoring program. Both rearrest and FTA rates are higher in the drug monitored group. Although the control group rates appear to be similar to those in the earlier experiment (combined failures in the mid-forties), the monitored group has much higher rearrest rates than in other groups, driving up the combined failure statistic. In subsequent analyses we hope to examine the role that differential assignment might play in these results, but it seems unlikely that the modest violations of assignment could reverse the effects discovered here. Thus we conclude that, taken together, the Maricopa experimental studies fail to discover an important effect for drug monitoring on pretrial misconduct.

The Monitoring Program. We studied the experiences of the defendants assigned to the monitoring program in our

first experiment to determine the extent of testing, the types of failures in the testing program, and the extent and nature of the sanctions actually used. Of the 118 cases in the monitoring program, 36, or 30%, received no drug tests during the monitoring period. Since all defendants in the program were assigned initially to the same testing schedule, it is unclear why these defendants received no tests. Another 33% of the defendants received between one and three tests during the monitoring period and the remaining defendants were spread fairly evenly throughout the number of test distribution, with one defendant tested 28 times.

The majority of defendants did not test positively for any drug during the monitoring period (58%). Nineteen percent tested positively once, 10% twice, and 6% three times. At the high end of the distribution, one defendant was positive 14 times and one defendant was positive 22 times. Nonappearances for scheduled testing were somewhat more common--about 40% never missed a scheduled test, but 17% missed one or two, 16% four or five, and 18% six or seven. Seven defendants missed between seven and twenty-four scheduled tests. Among those testing positive, cocaine was far and away the most heavily used drug.

Because of the agency's emphasis on consecutive instances of noncompliance, we examined the failure experiences of the sample by recording instances in which

the defendant either failed to appear for a scheduled test or tested positively on consecutive occasions. Measured in this way, the monitored group had substantial failure rates; indeed, only one-third of the sample had no consecutive failures at some point in the monitoring period. The number of consecutive failures ranged from one (15%) to nine (7%). In fact, 43% of the monitored group had four or more consecutive program failures.

When read in light of these failures, the use of sanctions by the program may appear modest. Sixty percent of the monitored group received no sanctions, 17% were given a verbal warning only, 2% were both given a verbal warning and were escalated to a fixed testing schedule, 6% were given a written warning, and 14% received a petition to the court to revoke release. The data do indicate a relationship between the conduct in the program and the extent of the sanction applied--94% of those who received a petition to the court had four or more consecutive failures.

In summary, despite differences in program details and in the base-rates of pretrial misconduct between Pima County and Maricopa County, the general sense of the combined evaluation seems to be substantial similarity. The ability of drug tests to add significant predictive power to the problem of pretrial risk of misconduct appears to be limited. The ability to alter significantly the pretrial

misconduct of defendants through the drug monitoring process appears similarly to be limited.

IV.   Financial Considerations.

IV.1. Pima County.   Given the lack of substantial effects for the drug testing program in Pima County, an elaborate cost-benefit analysis is unnecessary.   However, we solicited from the Director of the pretrial services agency cost estimates for the project.   We sought estimates of the expenditures from the Bureau of Justice Assistance grant to the agency and direct expenditures from the county.

During the first year of the project, grant expenditures totaled $ 262,376 and county expenditures (for personnel only) totaled $ 220,874 for a grand total, first year expenditures of $ 483,250.   For the subsequent nine-month period (used to coincide with county budget year), the federal grant expenditures were $ 317,749 and the county expenditures (personnel only) were $ 90,452 for a nine-month total of $ 408,201 (all financial data from correspondence from the Director of the Pima County Pretrial Services Agency to Director of the evaluation study).

A considerable consequence to the Pima County Pretrial Services Agency of the drug testing program was the vastly increased scope of defendant monitoring and supervision that the program created.   Subsequent to the program, persons who typically would have been released on their own recognizance

by the courts at their initial appearance were instead released to the supervision of the agency, thereby greatly increasing the caseload of the agency and greatly increasing the staff requirements. Figures 1 and 2, provided by the agency, describe the tremendous increase in supervision demanded of the agency by the drug testing program (initiated in 1988) in comparison to the relatively stable numbers of defendants interviewed for initial appearance. Between 1987 and 1989, the agency experienced a 233% increase in workload with essentially the same number of defendants interviewed.

IV.2 Maricopa County.

The total grant expenditures for the first two years of the Maricopa County drug testing project were approximately $957,000 (cost data from Maricopa were provided by the Director of the project). Substantially less county funds were required in Maricopa, as opposed to Pima County, because the federal grant funds were sufficient to hire the supervision staff necessary to manage the caseload. Still, estimated expenditures for county staff time dedicated to the drug testing program were $18,700 for the first year and $20,700 for the second year. Thus the two-year direct expenditures for the project was about $ 1 million.

No previous evaluations of drug testing programs for pretrial populations have included financial data, as far as we are aware. Rather, such programs tend to be evaluated as

FIGURE 1

FELONY INTERVIEWS CONDUCTED BY PTS
FOR INITIAL APPEARANCE COURT
1978 THROUGH 1989

NUMBER OF DEFENDANTS

Bar chart values by year:
- 1978: 3774
- 1979: 4314
- 1980: 4845
- 1981: 4453
- 1982: 4741
- 1983: 4709
- 1984: 4681
- 1985: 5082
- 1986: 5817
- 1987: 6476
- 1988: 6676
- 1989: 6500

YEAR
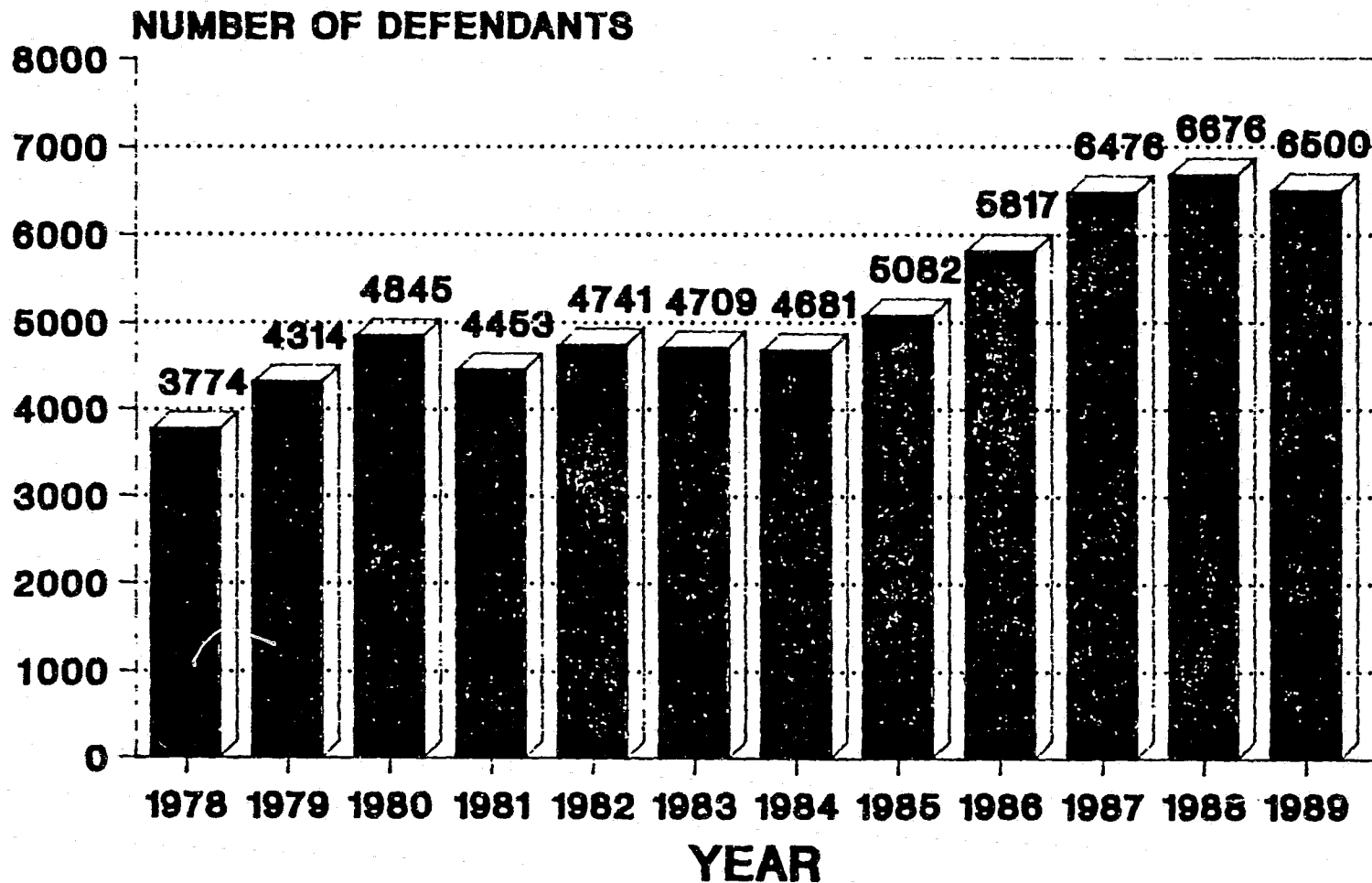
FIGURE 2

DEFENDANTS RELEASED TO PTS
1981 THROUGH 1989

NUMBER OF DEFENDANTS

Bar chart showing number of defendants by year:
- 1981: 652
- 1982: 669
- 1983: 708
- 1984: 1112
- 1985: 1162
- 1986: 1349
- 1987: 1528
- 1988: 3566
- 1989: 3503

YEAR
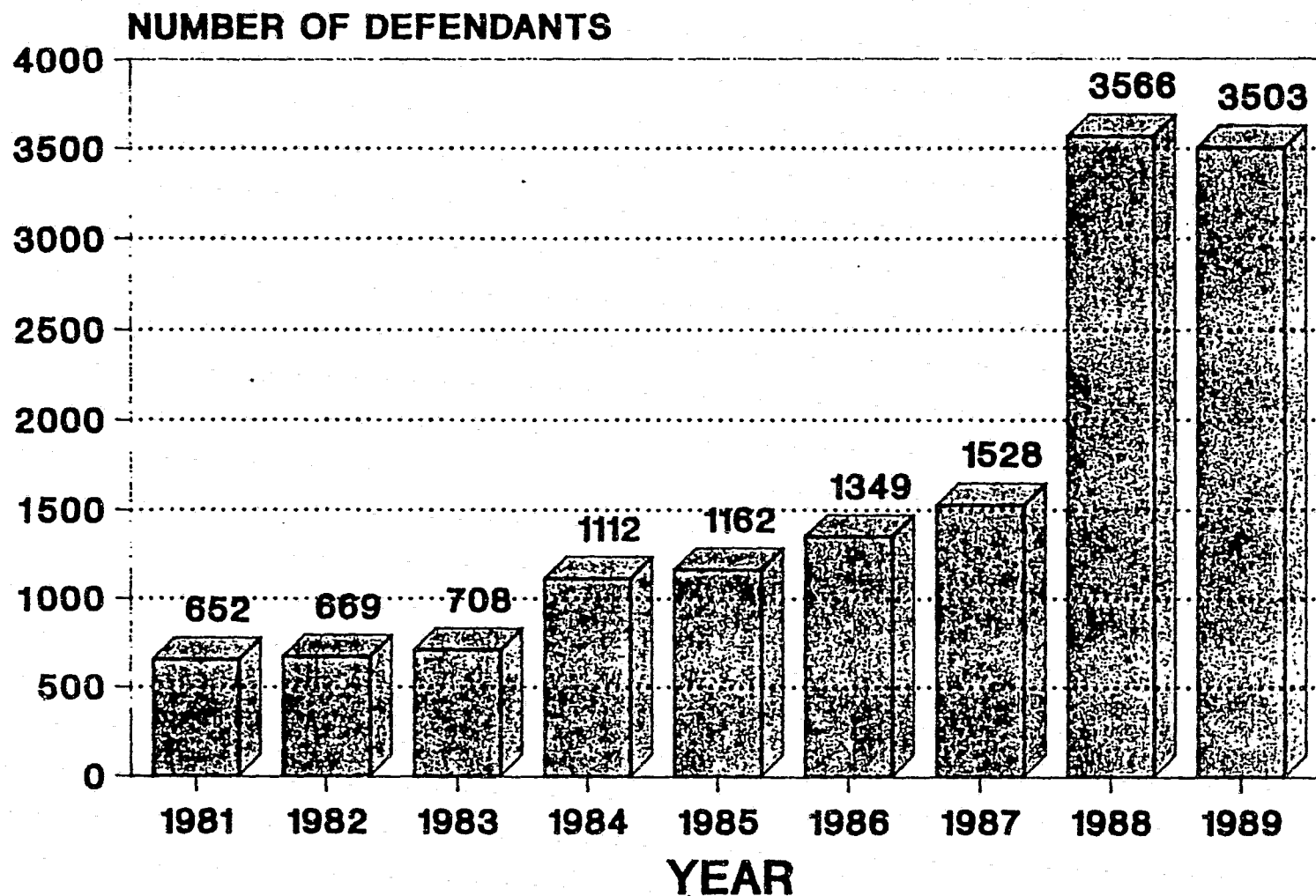
though they had no financial implications to counties, other than perhaps to save some money by lowering rearrest rates or the proportion of defendants who fail to appear. But the implementation of a mass screening and monitoring program such as these are clearly expensive--in terms of equipment, test costs, and staff. On the other hand, the potential savings, given the high cost of incarceration and the often incalculable costs of victimization, make such programs very tempting. Some balancing task is necessary.

Taking Pima County as an example, during the period of study, it is estimated that the cost for one day in the county jail averaged $65.00. Using the financial data from the second year of the project (annualized at $544,268), a total of 8,373 jail days would be required to be saved by the project, just to break even (and ignoring victimization reduction benefits). This would be roughly the equivalent of keeping the entire caseload released to the agency in one month out of jail for one month, under the assumption that all of the defendants would be in jail for the month. Or, given a failure rate of 15% (which is higher than the actual agency failure rate) for both failure to appear and rearrest cases, the expenditures would require all 513 expected failures for the year to average 16 days in pretrial detention and to be "saved" (i.e., to serve a trouble-free period of pretrial release). These clearly are not reasonable assumptions.

Focusing on the community safety rationale for these programs requires that we assess the number of burglaries, robberies, car thefts and assaults, the reduction of which would justify the additional expenditure of in excess of one-half million dollars annually by the county. Since no rearrest effect beyond drug offenses can be documented, this is unnecessary. More appropriately, perhaps, would be to compare crime-reduction efficiency of spending the half-million on drug testing of pretrial defendants versus spending the money for sheriffs' personnel and equipment, for intensive probation, or drug education and treatment programs. Given the low success rate of the drug testing program under the most favorable interpretation of these data, the county would need to seriously question the appropriateness of expenditures for drug testing of this population. And, if reduction of jail costs are the concern, it is difficult to see how an intensive pretrial supervision program targeted on a detained population who would be released only to such supervision could not greatly improve on the savings to the county. In short, it is difficult to see how expenditures of this magnitude could be justified for a county the size of Pima given its pretrial situation.

V. PROGRAM MODIFICATIONS BASED ON INITIAL EVALUATION

RESULTS.

V.1. Pima County. Given the very modest relation between
drug test results and the problems of predicting failure to
appear and pretrial crime in Pima County, and given the
great expense of the drug testing program, the evaluation
team undertook analyses at the request of the pretrial
agency designed to enhance the efficiency of the drug
testing project. These analyses focused at two points in
the program; first, whether it was possible to implement
some screening mechanism that would "weed out" defendants
unlikely to test positively for drug use prior to initial
appearance and thus save drug testing costs, and second,
whether it was possible to enhance the efficiency of the
drug monitoring program, such that the number of tests
during the monitoring period might be reduced.

To help answer the first problem, the evaluation team
undertook analyses with the aim of predicting failure for
the drug test itself. Given that we had available an
enormous amount of information about each defendant,
including whether or not he or she tested positive for drug
use, we modelled drug use as our dependent variable.
Included as predictors were items derived from prior
analyses of this type in other jurisdictions, notably age,
prior criminal history, offense type, and community ties
indicators.

Logistic regression was used to estimate the model of drug test result (as a dichotomy). A combination of variables representing age group, prior FTA, and whether the defendant was currently charged with a drug offense were found to adequately represent the data. Coefficients for these variables were converted to odds and a simple scale of three factors was constructed to estimate the chances that a particular defendant would fail the drug test. The scale (shown in Table 37) discriminated the defendants from a low of 35% failure to a high of 73% failure, with defendants who are young, with prior failures to appear and with current drug charges having higher failure rates. (It is interesting to note that it appears that prior criminal activity variables, along with age, are better predictors of failing the drug test than drug test results are at predicting subsequent failure during pretrial release.) In any event, the scale did appear to be useful to the agency in allowing for some efficiencies in the selection of candidates for drug testing; the scale was implemented by the agency during the second round of their funding.

We also examined the testing history of those defendants in the monitoring program, in an effort to determine whether there was evidence of diminishing returns or redundancy in the testing program. Analyses were undertaken asking the question of the probability of failure

TABLE 37

Drug Test Risk Scale, Base-line Sample
Pima County

Risk Scale	Positive	Percentage of Total
Low	35	25
Medium	62	37
High	73	37
Total	59	100

Risk Scale consists of the following items:
   Prior failure to appear at trial.
   Drug Charge.
   Age.

in the monitoring program subsequent to N successful drug tests.

These analyses suggested strongly that those with negative tests during the monitoring period tended to remain negative. In fact, the probability of a positive test given 4 negative tests (two weeks worth) was 5%. Given that many defendants were kept in the monitoring program for lengthy periods of time (one-half of the participants were still being tested regularly after two weeks and some defendants were tested as many as 20 times), it appears that efficiencies could be achieved by limiting the number of tests for those who continuously test negative. This result was also incorporated into phase two funding by the agency.

V.2. Maricopa County

At the request of the Maricopa Pretrial Services agency, similar analyses were undertaken to assist the agency in making the drug testing as efficient as possible, given the requirement of testing in the first instance. Once again, logistic regression analysis was undertaken on the base-line sample with the aim of estimating a model for the prediction of testing positive on the initial appearance urine test. The purpose was to develop a model that would reasonable well estimate a group whose probability of testing positive was low enough that it would be unnecessary to devote resources to testing.

The analyses suggested that two distinct models could
be generated that performed this task. The first model
included only information that could be gleaned from the
agency's records (i.e., did not include data from the
interview with the defendants). This model, shown in Table
38, included as predictors the number of prior failures to
appear, age, and the number of prior convictions.
Coefficients for these factors were converted to
probabilities and subsequently to "points" that could be
added to determine a total score. This score, shown in
Table 39, classified the sample into groups with rates of
positive drug test results ranging from 24 to 58 percent.

The second model included information gathered from the
pretrial services interview with the defendant. As it
turned out one item of information from the interview--
whether the defendant self-reported drug addiction treatment
in the previous year--was highly indicative of testing
positively. This second model, shown also on Table 38,
included this item as well as the number of prior failures
to appear, age, and whether the arrest was for a property
offense. This model, converted to points, achieved somewhat
better discrimination in the sample (Table 40). The
resulting classification created groups with positive test
percentages ranging from 14 to 56. As was the case in the
Pima project, the agency decided to adopt this screening
device, during the third phase of their funding.

TABLE 38

Maricopa Drug Test Models, Base-line Sample

MODELS:

MODEL NO. 1:   POINTS

    (a) Prior FTA   =   (4 if Yes

                                   (0 if No

    (b) Age ≥ 26   =   (0 if Yes

                                   (1 if No

    (c) Computer Check   =   (0 if no Priors
        on No. of Priors   (2 for Each Prior Arrest

MODEL NO. 2:   POINTS

    (a) Prior FTA   =   (0 if No

                                   (4 if Yes

    (b) Age ≥ 26   =   (0 if Yes

                                   (1 if No

    (c) Property Offense =   (0 if No

                                   (4 if Yes

    (d) Ever Treated For =   (0 if No
        Addiction   (5 if Yes

TABLE 39

Estimates of Positive Drug Test, Model 1,
Maricopa County

Number of Points	Percent Testing Positive	Percent of Sample
0	24	19
1-4	37	48
5-9	41	24
10-20	58	9

TABLE 40

Estimates of Positive Drug Test, Model 2
Maricopa County

Number of Points	Percent Testing Positive	Percent of Sample
0	14	6
1-4	24	33
5-8	42	48
9-14	56	13

V.I. Conclusions

Few program evaluations provide definitive results that can be sure guides to policy decisions, and this report is no exception to that maxim. There are shortcomings of the research and circumstances of the particular programs that were implemented that indicate caution in drawing firm conclusions. The sample sizes, particularly for the experimental portion of the research, were not as large as we would have liked, although they were as large as time and resources permitted. On the other hand, the experimental design was strong and seems to have been reasonably well executed for the most part. The agencies provided excellent cooperation to the research team, making possible a true randomized experiment in an operational criminal justice setting, a particularly difficult enterprise.

The conclusions of this research about drug testing programs for pretrial release must be conditioned on the nature of the programs themselves. As was shown in this report the programs did monitor through periodic urine tests the majority of the defendants in the program and some sanctions for noncompliance were issued. Some will certainly argue that the sanctions used by the programs studied here were insufficient to have a strong deterrent effect and that were stronger sanctions used, more evidence of deterrence would be found. This explanation of the results is certainly possible. However, in the face of such

arguments it must be recalled that the baseline study found
little predictive value for the drug test results over and
above what could be achieved by the use of commonly
available record data. It must also be noted that programs
with stiffer sanctions would be more costly, making the
cost-benefit burden of the program all the higher. Finally,
with respect to the "strength of the treatment" issue, it
should be noted that this research was carried out in two
sophisticated and experienced pretrial service agencies. It
is reasonable to assume that the programs that were
implemented here are comparable to the programs that are
likely to be implemented in similar agencies, agencies also
concerned about a host of issues simultaneously, such as
jail crowding, case-load sizes, budgets, and pretrial
liberty, as well as FTAs and community safety. There may be
programs that would use stiffer sanctions, but these
programs are arguably well within the range of potential
programs that would implement drug testing.

In light of these considerations, and in light of the
data presented in this report, it seems reasonable to
conclude that systematic drug testing and monitoring in the
pretrial setting, in programs such as those described above,
are not likely to achieve significant or major reductions in
pretrial misconduct or to allow significantly better
predictions of pretrial misconduct for decisionmakers.
Given the high financial costs of these programs, including

the testing and staffing required to accomplish them, they
are difficult to justify.   There may be exceptions to this
overall conclusion: the small reduction in drug related
charges in the pretrial period for the monitoring group in
Pima County and the apparent ability of positive tests for
cocaine to add somewhat to the prediction of pretrial
misconduct controlling for other predictors in Maricopa
County are two findings that can lend support to the view
that the programs were somewhat successful.   These findings
must also, however, be placed in a cost-benefit framework
and counties should decide whether these gains could be
worth the expense of the program.   Taking both sites
together and considering both the base-line and experimental
data, it seems most reasonable to question the effectiveness
and the cost-efficiency of these pretrial drug testing
programs.

VII. REFERENCES

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VIII. APPENDICES

A. Sample Data Code Sheets

Maricopa Code Book

Columns	Codes

Note: First code from the interview form.

1-4	Enter 4 digit number in sequence.
5-10	Enter the booking number.
11	Sex: 1 = Male 2 = Female 9 = Unknown

12	Ethnicity:
	    1 = White; 2 = Hispanic;
	    3 = Black; 4 = Asian; 9 = Unknown

13-14	Age: 99 = unknown
15-20	Date of Birth: month/day/year; 999999 = Unknown
21	Phone: 1 = yes; 2 = no; 9 = unknown

22	How long at present address:
	    1 = less than one week;
	    2 = one week to one month;
	    3 = more than one month to one year;
	    4 = more than one year to 5 years;
	    5 = more than 5 years;
	    9 = unknown.

23	Marital Status: 1 = s; 2 = m; 3 = sep.
	                4 = div.; 5 = com-law;
	                6 = wid.; 9 = unknown.

24	Employment: 1 = employed;
	             2 = unemployed;
	             3 = disabled;
	             4 = retired.

25	Grade completed: 1 = ged;
	                 2 = 9 or less;
	                 3 = 10 to 12;
	                 4 = more than 12;
	                 9 = Unknown.

26	Criminal record, number of charges; Code number listed, except: 8 = 8 or more;

                         9 = unknown.

27   Presently on prob. or parole:
                         1 = yes;
                         2 = no;
                         9 = unknown.

28   Prior FTA: 1 = yes, one listed;
                         2 = no or none
                                listed.

29   Presently on Bond/OR:
                         1 = yes;
                         2 = no or not listed.

30   Drug, alcohol, physical treatment last
         six months: 1 = yes;
                         2 = no;
                         9 = unknown.

31   What drugs are you currently using:
                         0 = none;
                         1 = marijuana;
                         2 = cocaine;
                         3 = barbiturates;
                         4 = amphetamines;
                         5 = alcohol;
                         6 = pcp;
                         7 = opiates
                         8 = other (write on form)
                         9 = unknown

32   How often:
                         0 = no use
                         1 = every day;
                         2 = not every day, but
                            at least once week;
                         3 = not once week, but
                            at least once month;
                         4 = less than once month
                         9 = unknown

33   What drugs have you used last 6
             months:
                         0 = none
                         1 = marijuana
                         2 = cocaine
                         3 = amphetamines
                         4 = barbiturates
                         5 = alcohol
                            6 = pcp
                         7 = opiates
                         8 = other (write)

9 = unknown

34   How often:
                       0 = no use
                       1 = every day;
                       2 = not every day, but
                           at least once week;
                       3 = not once week, but
                           at least once month;
                       4 = less than once month
                       9 = unknown

35   Currently using alcohol:
                       0 = no
                       1 = yes
                       9 = unknown

36   How often:
                       0 = no use
                       1 = every day;
                       2 = not every day, but
                           at least once week;
                       3 = not once week, but
                           at least once month;
                       4 = less than once month
                       9 = unknown

37   Have you been treated for drug
addiction:
                       0 = no
                       1 = yes
                       9 = unknown

38   When:
                       0 = no
                       1 = now
                       2 = not now, past year
                       3 = over year ago
                       9 = unknown

39   Have you been treated for alcohol
addiction:
                       0 = no
                       1 = yes
                       9 = unknown

40   When:
                       0 = no
                       1 = now
                       2 = not now, past year
                       3 = over year ago
                       9 = unknown

41   Background verified:
                                    1 = verified;
                                    2 = not verified;
                                    9 = unknown.

42   Computer check number of priors:
                                    0 = no priors;
                                        else write number
                                        except;
                                    8 = 8 or more;
                                    9 = unknown.

NOW CODE FROM THE CLASSIFICATION WORKSHEET

43-46   Charge one code section number

47   Severity level

48-51   Charge two code section number

52   Severity level

53-56   Charge three code section number

57   Severity level

58-61   Charge four code section number

62   Severity level

63-66   Charge five code section number

67   Severity level

68   Total number of charges listed

69   Highest severity level

70   Risk group checked:
                                code 1-4 except;
                                9 = none checked.

71   Prior FTA's:
                                0 = none checked;
                                1 = one;
                                2 = 2 or more.

72   Police note facts:
                                0 = no;
                                1 = yes.

73   Property offense:
                                0 = no;

	1 = yes.
74	Lives alone: 0 = no; 1 = yes.
75	Charges involve robbery: 0 = no; 1 = yes.
76	Police risk with FTA's: 0 = no; 1 = one prior FTA; 2 = two or more.
77	Police risk and lives alone: 0 = no; 1 = yes.
75-80	Blank

NOW CODE FROM GUIDELINE FORM

1-4	Sequence number: repeat from card one.
5	Attorney appointment: 1 = pd 2 = pvt 3 = ne 9 = unknown.
6	Risk group: enter number
7	Severity level before factors: enter number
8	Special severity for Weapon 0 = no 1 = yes
9	Special severity for Injury 0 = no 1 = yes
10	Special severity for Serious 0 = no 1 = yes
11	Final severity level: enter number.

12	Guidelines followed:
	0 = no;
	1 = yes;
	9 = unknown.

13	Reason not followed:
	0 = followed;
	1 = murder;
	2 = probation/parole;
	3 = other sentence;
	4 = fugitive;
	5 = other (please write on sheet)
	9 = unknown.

14-19

Court date:
month/day/year

20-25

Decision:
000000 = nonfinancial/standard
000001 = nonfinancial/special
else amount of bond, except;
999998 = 999998 or more
999999 = bond unknown.

26

Did defendant refuse test (from pre specimen log):
0 = no refusal
1 = yes, refusal

NOW CODE FROM DRUG TEST PRINTOUT

27

Number of drugs tested positive:
Enter number (0 - 5)
except, 9 = no test.

28

Cocaine test:
0 = negative
1 = positive

29

Opiates test:
0 = negative
1 = positive

30

Amphetamines test:
0 = negative
1 = positive

31

Barbiturates test:
0 = negative
1 = positive

32

PCP test:
0 = negative
1 = positive

NOW CODE FROM COMPUTER

33-38	Date of disposition: month\day\year
39-44	Date of first FTA after booking: month\day\year
45	Number of FTA during this release: 0· = none, else, code number except 8 = 8 or more, 9 = unknown
46-51	Date of first arrest after booking: month\day\year

52-55	Code section number of most serious
	arrest during release, using
	guidelines codes:
	except:
	    0000 = no arrests
	    9999 = unknown

56	Grade:
	    0 = misdemeanor
	    1 = felony

57	Total number of pretrial arrests:
	    0 = none
	    else, code number, except
	    8 = 8 or more
	    9 = unknown

58-63	Date of Pretrial release: month\day\year

Card Three

1-4   Sequence number

5   Number of scheduled tests per week

                               Code actual number, except
                               9 = not known

6-7   Total number of tests given during
                           monitoring

                               Code actual number, except
                               99 = unknown

8-9   Number of Positive drug tests

10-11   Number of scheduled tests defendant
                           did not appear for

12-17   Date of first positive test

                               Code month\day\year, except
                               888888 = no positive tests
                               999999 = unknown

18-19   Drug(s) tested positive for

                               00 = none
                               01 = cocaine
                               02 = opiates
                               03 = amphetamines
                               04 = barbituates
                               05 = pcp
                               06 = cocaine and other(s)
                               07 = opiates and other(s)
                               08 = amphetamines and other(s)
                               09 = barbituates and other(s)
                               10 = pcp and other(s)

20   Number of consecutive positive
                           tests or failures to show for
                           testing

                               Code actaual number

21-22   Sanctions given--code highest
                           applicable number

                           01 = verbal warning only

02 = verbal warning and escalation
from randon to fixed testing.
03 = Written warning
04 = Written warning and escalation
of testing
05 = petition to revoke

23   Did court revise conditions of
release

1 = yes
2 = no
3 = unknown

24-29   Program termination date
month\day\year
999999 = unknown

end of card

B. Pima Site Program Descriptions