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PUBLIC DRUG TREATMENT AND ADDICT CRIME

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PUBLIC RESEARCH INSTITUTE
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PREFACE

The Public Research Institute is a division of the Center for Naval Analyses, a Federal Contract Research Center affiliated with the University of Rochester. Support for this study was provided by the National Institute on Drug Abuse under NIDA grant H81-DA-01694-01. Views expressed in this report are those of the authors and do not necessarily reflect the official position of NIDA.

Dr. Edward Leibson and his staff at the Wayne County Department of Substance Abuse Services provided us with the treatment data and helped us greatly throughout the analysis. The Detroit Police Department gave us extracts of their computerized offense and arrest files.

We thank both groups for their assistance.

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CHAPTER I

INTRODUCTION

Since the early 1960's the use of illicit drugs has grown rapidly in this country, matched by growing public concern for its effects on people's lives. Initial government efforts to deal with this problem were limited to the use of law enforcement and diplomacy to interrupt the supply of illicit drugs. But reductions in supply predictably led, through market forces, to large increases in price. Supposing that these price rises have exceeded the reductions in quantity bought, in proportional terms, total expenditures on drugs will be larger as well. Many feel that this has occurred, and that drug addicts are now committing more property crime to finance the higher cost.*

In an effort to find ways of limiting addiction without incurring the higher social costs of more crime, drug policy was broadened in the early 1970's to include the public funding of drug treatment centers. It was hoped that by helping addicts to give up the use of expensive illicit drugs, in exchange for a drug-free life or one dependent on free methadone, addiction would be curtailed without increasing crime in the process.

Some recent studies show that treatment of heroin addicts reduces their criminality,** but their data suffer from two drawbacks which make it difficult to judge the reliability of their findings. In some of these analyses, criminal behavior is measured by reports by the addicts themselves, raising the possibility of large bias: Treatment clients might under-state the number of offenses they commit after treatment in order to support its continuation, or they might under-report their criminal behavior both before and after treatment out of fear of apprehension.

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*The existence of this suspected positive connection between drug prices and crime has been verified in recent research by the Public Research Institute. Analysis of data for the city of Detroit covering the 33 months from July 1970 to April 1973 shows that increases in heroin price were closely related to increases in the level of property crime. (See Lester Silverman, Nancy Spruill, and Daniel Levine, "Urban Crime and Heroin Availability," Public Research Institute, PRI 75-1, April 1975.)

**See, for example, the review of past studies of drugs and crime by Carl Chambers, "Narcotic Addiction and Crime," in Incardi, J. and Chambers, C., Drugs and the Criminal Justice System. Beverly Hills: Sage, 1974.

The other major problem with many studies is that the association between treatment and crime is measured for only a limited sample of addicts, raising the question of how typically the sample mirrors the entire population. For example, those addicts submitting to voluntary questionnaires might more likely be the ones whose criminality has declined the most. Even measuring the criminal behavior of the sample by police records would not completely remove the possibility of bias -- if, for example, the sample were drawn from a single agency or area of the city to minimize the cost of carrying out the study, and if there are systematic variations in individual differences across the city.

This study, intended to help in the evaluation of treatment policy, shows that public drug treatment in the city of Detroit has led over a recent 4-year period to the desired reduction in property crime.* In reaching this finding, however, we have avoided the problems associated with self-reported crime and limited sampling, by relating the monthly enrollment in all Detroit treatment agencies to monthly changes in the total level of property crime reported to the Detroit police. This aggregate approach obviously cannot answer questions on the clinical level about the behavior of particular sub-classes of drug addicts. Nor do we evaluate the benefits that treatment centers provide their clients through job training, psychological counseling, and family services. It does provide a statistically reliable test of the major assumption underlying public policy on drug abuse, that drug treatment reduces property crime.

RELATIONSHIP BETWEEN DRUG TREATMENT AND CRIME

A typical heroin habit in Detroit costs about $45 per day, ** or $16,000 annually. Only the affluent can afford such spending rates out of legitimate income. Others must turn to property crime for the money.

*We do not mean that crime is now lower than in the past, but that it is lower than it would have been without public treatment.

**This estimate by Dr. Edward Leibson, Director of the Wayne County Department of Substance Abuse Services, characterizes those who are addicted. It should not be regarded as an average for all users, including occasional week-end users ("chippers").

But obtaining enough funds this way is not an easy task. Our Detroit crime data shows that victims of property crime report an average loss of $200 per offense. Assuming that money is stolen, an addict must commit an average of 1.5 successful crimes per week to raise $45 per day. If the stolen property is not money, the criminal might have to "fence" the goods at only one-third of market value, thus requiring almost 5 successful crimes per week. Considerable mental and physical effort is required to keep this up week after week.

An individual who wishes to abandon the "hassle" in return for a more peaceful existence, can seek the help of a drug treatment center. Whether the addict abandons drugs completely in an in-patient or out-patient drug-free clinic, or forgoes heroin use with the daily support of methadone maintenance, the compelling need for money to buy drugs is reduced. One implication of this is that enrollments in treatment centers will rise with increases in the cost of a drug-dependent life; such increases can result from rises in the price of drugs, or through higher probabilities of arrest for drug use. Another implication is that enrollment of criminal addicts in drug treatment programs will lead to a reduction in crime. Both of these implications are tested in this study.

ANALYTICAL APPROACH AND MAJOR RESULTS

To measure the relationship between treatment and crime, we have measured the monthly number of property offenses reported to the Detroit police, and related this time series to monthly enrollments in all Detroit drug treatment centers, the price of heroin, and other variables that affect the level of crime. The major findings are that a 1.0 percent increase in treatment enrollment is associated with a 0.23 percent decrease in property crime, and that a 1.0 percent rise in heroin price is accompanied by a 0.16 percent rise in crime.

We have also carried out 3 supporting analyses on related topics. The first examines how much mutual relationships between the variables biased the measurements of the crime-treatment-price relationships using the above procedure. Of particular importance is the possibility that treatment and heroin price are related to crime through a "reverse" mechanism: That higher crime levels push up addict incomes with the joint outcome of reducing the

need for treatment to avoid the high cost of drugs, and bidding up the price of heroin. We find that this mechanism has little predictive power, and that the previous estimates of the effect of treatment and price on crime are not seriously biased.

The second supporting analysis deals with the question of how to induce addicts to enter treatment, assuming the desirability of doing so. For this analysis, we examine the determinants of the number of new enrollments during the month (inflow). We find that the rate of treatment inflow will increase with higher heroin prices and numbers of narcotics arrests, both of which measure the cost of drug involvement.

Finally, we examine urinalysis data to obtain a direct measure of heroin use by treatment clients. We find that only 11 percent of urine samples of methadone patients are "heroin dirty." Assuming that testing was random among individuals, this means that only 11 percent of methadone clients still use heroin, compared to the almost 100 percent who used it before entering treatment.

CHAPTER II

MAJOR ANALYSIS

DATA

To measure the dependence of property crime on drug treatment, it is important to account for other influences on the crime rate. We have considered heroin price and potency, the offense clearance rate, the unemployment rate, average temperature, season of the year, and time trend. This section describes how we obtained monthly measures of all variables. Statistics are summarized in table 1.

TABLE 1

SUMMARY STATISTICS FOR TIME-SERIES VARIABLES
(November 1970 -- June 1974)

	Mean	Standard deviation
Number of property crimes per month	10,475	1,804
Treatment enrollment[a]	3,609	2,659
Heroin price per gram	$71.72	$14.15
Heroin potency	10.63%	8.36%
Property offense clearance rate	11.86%	.96%
Unemployment rate (seasonally adjusted)	7.74%	1.05%

[a]Estimated figures for Wayne County (which contains Detroit and suburbs)

Property Crime

Our interest in the criminal behavior of addicts is confined to offenses related to raising money for expensive drugs, that is, property or revenue-raising crimes: robbery (armed and unarmed), * burglary (residential and business), larceny (grand and simple), and auto theft.

*Armed robbery, although clearly a property crime for our purposes, is regarded by the FBI as a violent crime, along with murder, rape, and assault.

The measure of property crime used in the analysis was constructed from a computerized file of all offenses reported to the Detroit* police from July 1970 through June 1974, and includes all crimes attempted, whether successful or not. Some offenses that were listed twice -- when committed and when cleared by arrest -- were later consolidated on the basis of the complaint number unique to each offense. Property offenses were separated out, grouped by month of commission, and aggregated to produce the final measure of monthly reported crime.

The resulting series (figure 1) shows a downward trend in the 4-year period analyzed and contains a strong seasonal component: many more crimes occurred in the summer.

Several features of our crime measure are worth comment. First, the reported rates of crime, taken from police records, are considerably lower than the actual rates. A recent study by the Law Enforcement Assistance Administration (LEAA) found that only about half of all property offenses are reported to the police in Detroit. There being no data on fluctuations with time in this reporting ratio -- number of crimes reported divided by number of crimes committed -- we use crimes reported as a proxy for crimes committed. Percentage changes in treatment can thus be related to the percentage changes in crime measured by our time-series analysis, without introducing bias.

The second qualifying point is that crime figures provided by the Detroit police -- and, consequently, our monthly property crime series -- measure total offenses only, without distinguishing between the offenders, whether addicts or non-addicts.** There is no way, therefore, of determining what fraction of total property crime is committed by addicts. However, we assume that reductions in crime that prove to be closely related to increases in treatment enrollment, while the other factors are held constant, are attributable to

*The cities of Highland Park and Hamtramck, although physically situated within the boundaries of Detroit, are separate municipalities. They have their own police forces and different reporting systems, and their crime data is not included in this study.

**Aside from occasional descriptions by victims, the characteristics of offenders become known to the police only at the time of arrest, and only 10-15 percent of offenses are eventually cleared by arrest (see appendix A). Moreover, the Detroit police tapes keep information on the drug involvement of arrestees in aggregate form only, with no link to offense data.

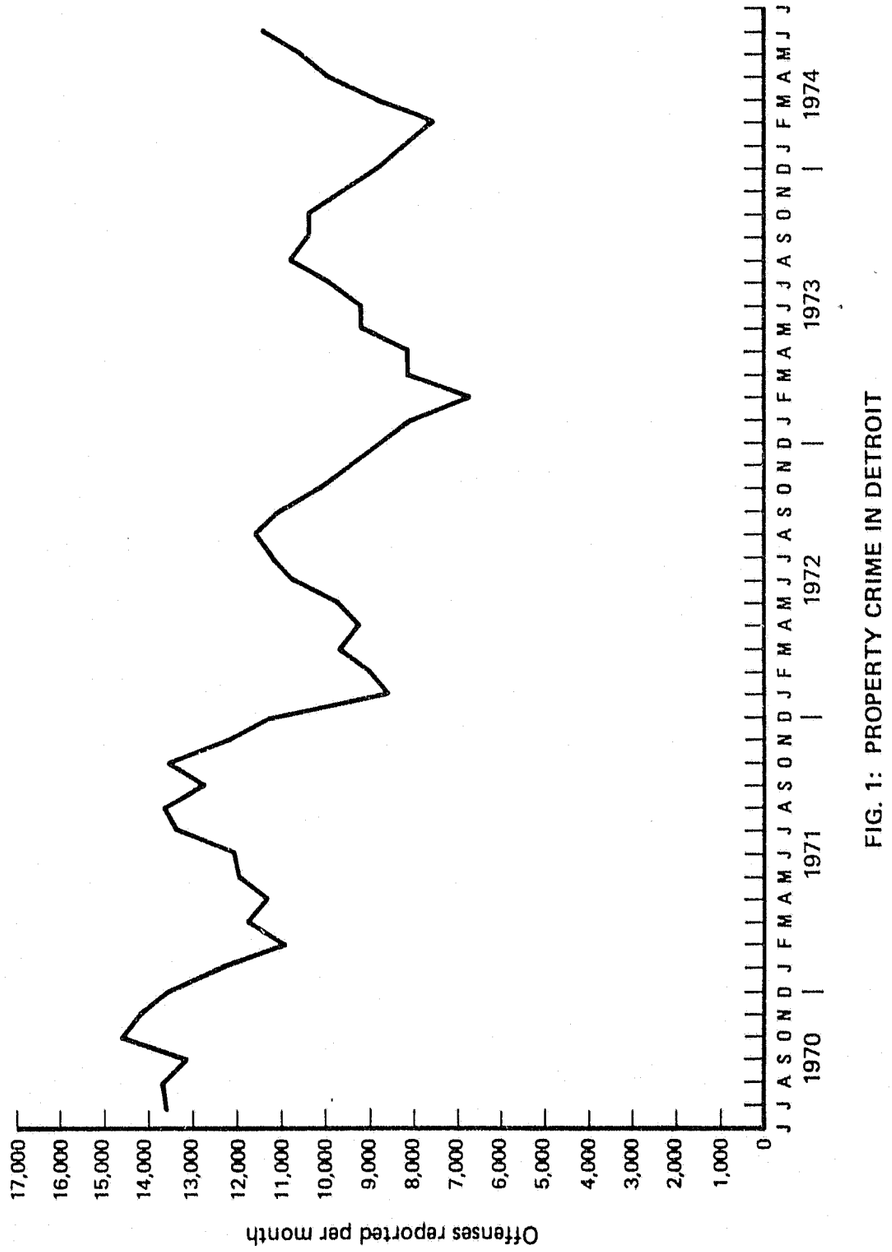

FIG. 1: PROPERTY CRIME IN DETROIT

changes in the behavior of drug-users only. (We would not expect the criminal behavior of non-users to vary systematically with changes in treatment enrollment.) It is these relative changes that we measure to test our hypotheses about addict behavior.

Treatment Enrollment

The drug treatment data for this study was supplied by the Wayne County (Michigan) Department of Substance Abuse Services (WCDSAS). This is a regional coordinating authority for all public treatment agencies in the county (which includes the city of Detroit and several suburbs), whether the support comes from federal, or state, or local governments. The WCDSAS provided us with computerized case histories for the 15,000 clients who had enrolled in 45 public treatment agencies since January 1973, when systematic reporting first started.*

The information on these tapes was used to estimate monthly treatment enrollment for Wayne County from January 1973 through June 1974 (shown by the solid line in figure 2). Enrollment before 1973, denoted by the dashed line, is a linear interpolation of point estimates provided by the WCDSAS for January 1970, 1971, and 1972.

The solid curve was obtained from the WCDSAS data tapes in two steps. The first was to eliminate 21 of the agencies from consideration and add up the monthly enrollments for the remaining 24. Two of the 21 agencies are prison programs, whose clients are obviously not part of the active criminal population. The other 19 had not reported to the WCDSAS consistently from January 1973 through June 1974. Including them would have biased the estimate of enrollment. The logic underlying the measurement of treatment enrollment, and data on reporting agencies, are presented in Appendix B.

*To ensure confidentiality, the WCDSAS tapes refer to individuals by code number; names and Social Security numbers are retained by the individual clinics.

The second step was to scale up monthly enrollments for the 24-agency sample to obtain the county-wide series. According to a WCDSAS estimate, the sample agencies had, in June 1974, enrolled about 48 percent of the addicts who were then attending public or private clinics (see table 2). Therefore, the sample enrollment in this month was divided by the "sampling fraction" of 48 percent to yield the county-wide total. Acting on WCDSAS's statement that this sampling fraction is fairly constant over time, we divided it into each month's sample enrollment from January 1973 through June 1974, finally producing the county-wide series shown by the solid curve in figure 2.

TABLE 2

DRUG TREATMENT POPULATION IN WAYNE COUNTY
(June 1974)

County-wide total	7300
Coordinated by the WCDSAS	
24-agency sample	3500 (48%)
Others	1000 (14%)
Not coordinated by the WCDSAS	
Public	1900[a] (26%)
Private	900[b] (12%)

[a]Estimated by Detroit treatment officials

[b]Clinics only; private treatment by physicians is excluded.

We constructed the dotted curve by linearly interpolating between the point estimates for January 1970, 1971, and 1972, to obtain the series shown.

Two features of this procedure are worth comment. First, the estimated population excludes addicts under individual care by private doctors, whether in the office or in a hospital. Such people are likely to be more affluent than those who seek treatment in public or private clinics and are thus less likely to be among the criminal population.*

*Detroit hospitals have about 50 beds for in-patient detoxification with methadone, and a similar number using other drugs. These numbers are much smaller than the clinic enrollments shown in table 2.

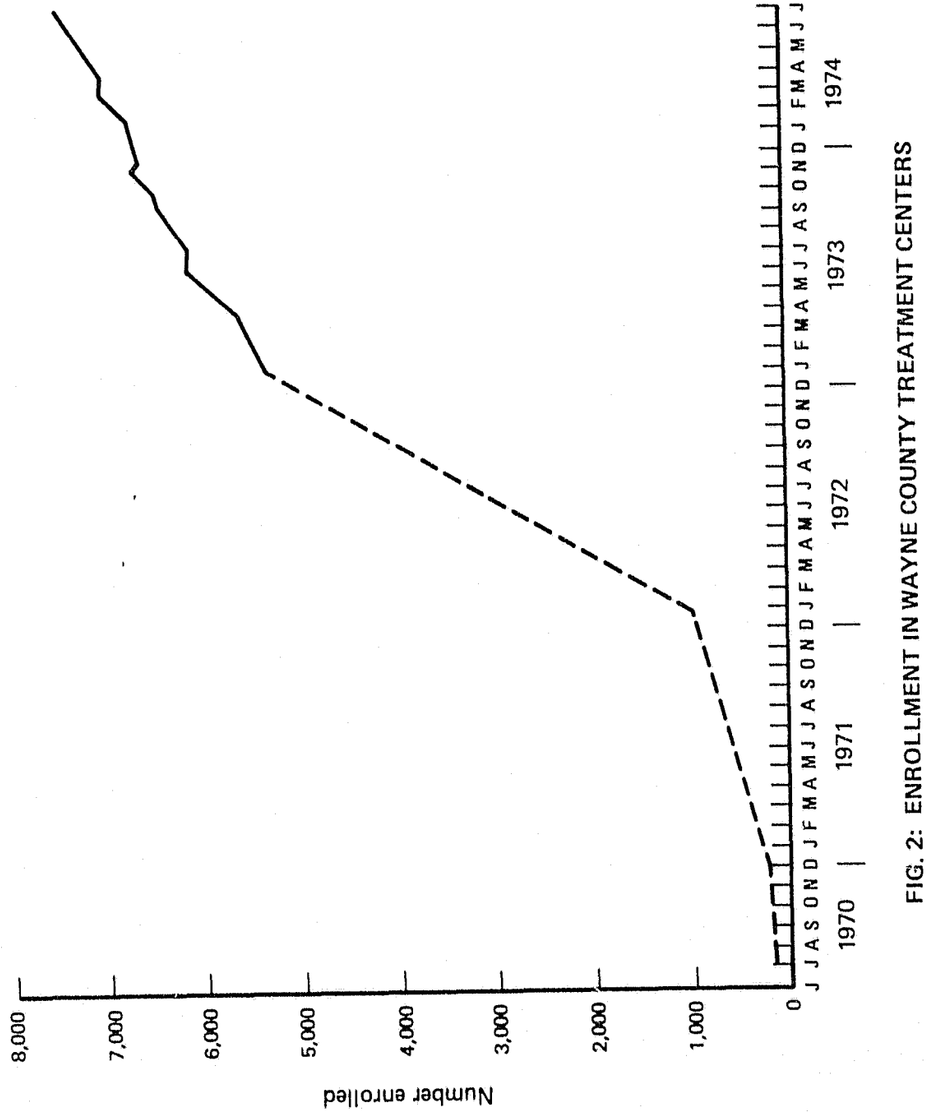

FIG. 2: ENROLLMENT IN WAYNE COUNTY TREATMENT CENTERS

The second point is that we estimated the enrollment for all of Wayne County, not just Detroit alone. (Detroit contains about half of the county's total population, 1.5 versus 2.7 million according to the 1970 Census.) The purpose was to include Detroit residents who go to clinics outside the city, but who may contribute to the city's crime problems. It was not possible to identify the clients in this category and add them to the Detroit treatment estimate, because treatment agencies record client residence at the time of admission only, and clients move often.*

Heroin Price and Potency

The monthly heroin price series was constructed from data supplied by the Drug Enforcement Administration (DEA). This data includes measures of quantity, potency, and amount paid for undercover purchases by DEA agents. Because purchases are made at all levels of the distribution chain, they vary widely in quantity, price, and potency. Moreover, the "mix" of levels may change from month to month. To obtain a measure of price unaffected by this source of variation and to more closely reflect relative movements in street prices, we used a method developed in a previous PRI study** for constructing a standardized price for a unit of constant quantity (2 grams) and potency (10 percent). The resulting series, displayed in figure A-1 of appendix A, shows wide fluctuations -- typically 25 percent from month to month -- which appears to be large enough to affect addict behavior. The upward trend amounts to an increase of about 40 percent over the 4-year period.

It is possible that heroin potency affects addict behavior, apart from its role in determining price.*** Higher potency may mean greater dependence on drugs and therefore a greater tendency for addicts to commit revenue-raising crime. Potency was therefore included as an additional explanatory variable.

*A WCDSAS survey of 3 inner-city agencies indicated that about 25 percent of their active clients had changed their residence at least once since enrolling, and average retention is only 7 months.

**George F. Brown, Jr. and Lester P. Silverman, "The Retail Price of Heroin: Estimation and Applications," Journal of the American Statistical Association, September 1974, Volume 69, No. 347, pp. 595-606.

***Price per pure gram equals price per gram of mixture divided by potency. Although our standardized price measure is not the same as price per pure gram, it does hold potency constant.

To estimate potency at the street level, we averaged monthly potency figures for all undercover buys under 25 grams. As shown in figure A-2 of appendix A, potency fell dramatically in the last four years with some recent variations.

Offense Clearance Rate

Intuition and recent research suggest that crime levels vary inversely with the effectiveness of the criminal justice system, that effectiveness being measured by such variables as arrest and conviction rates, delays, and lengths of sentence. We included the fraction of property offenses occurring in a given month that are eventually cleared by arrest.* This measure is the long-run probability that a criminal, contemplating his next offense, will be arrested for it. Whether offenders have any way of perceiving this long-run measure from recent police activity is not known.

Clearance rates constructed from the computerized data provided by the Detroit police are displayed in figure A-3 of appendix A. They show a variability of 40 percent from minimum to maximum.

Unemployment Rate

High unemployment rates may lead to more property crime. The unemployed have time on their hands, and they suffer reductions in income that are only partially compensated by unemployment insurance and public welfare programs.

The only monthly unemployment rate obtainable is that measured by the Michigan Employment Security Commission for the entire Detroit Standard Metropolitan Statistical Area (SMSA). The Commission estimates the unemployment rate for the entire labor force on the basis of statistics covering workers who are drawing unemployment compensation. We used the seasonally adjusted rate shown in figure A-4 of appendix A, because it better measures the amount of unexpected unemployment, which, we felt, would have a stronger effect on criminal behavior.

*Note the difference between "arrests" and "clearances." One arrest can lead to clearance of many previous crimes. Conversely, several arrests can be linked to a single offense and thus constitute a single clearance.

Seasonal Effects

Along with its dependence on other factors, the crime rate has a strong seasonal component; more offenses occur in the summer months. We used average monthly temperature to capture this dependence. Property crime also increases in the fall before the Christmas season. We accounted for this effect with a "dummy" variable (1 for fall months, zero otherwise).

Time Trend

Crime depends, of course, on many factors in addition to the ones examined in this study. Prime examples are such socio-economic variables as the age distribution of the population; its racial composition, income and education patterns; and peer group attitudes toward crime. By assuming that all such factors change slowly and monotonically over the 4-year period of analysis, we did not have to include them explicitly in the analysis. Rather, we factored out their influence by including a time trend variable in the model. This left only short-term movements to be accounted for by the previous explanatory variables.

STATISTICAL ANALYSIS

With the monthly data just presented, we related property crime to the explanatory variables by ordinary least-squares regression analysis. The results are shown in table 3.

All variables in the first column, except for the fall "dummy" and the time trend, were entered in logarithmic form and with appropriate lags to achieve the best fit. Use of logarithmic variables means that the regression coefficients in the second column show the proportional change in crime associated with a proportional change in the independent variable. The coefficient of -0.23 for treatment enrollment, for example, means that a 1.0 percent increase in enrollment (an independent variable) leads to a 0.23 percent decrease in property crime (the dependent variable), when the other independent variables are held constant. (Similarly, a 10 percent increase in enrollment would mean a 2.3 percent decrease in crime.)

TABLE 3

EFFECTS OF DRUG TREATMENT ON PROPERTY CRIME
IN DETROIT
(July 1970 -- June 1974)

Variable	Coefficient	t-statistic
Property crime (dependent variable)		
Constant	9.47	15.26***
Treatment enrollment	-.23	-7.51***
Heroin price		
Current month	-.06	-1.00
Lagged 1 month	.12	2.24**
Lagged 2 months	.10	2.10**
(long run)	(.16)	(2.03**)
Heroin potency	-.01	-.57
Offense clearance rate		
Current month	.49	3.51***
Lagged 1 month	-.21	-1.61
Lagged 2 months	-.65	-4.85***
(long run)	(-.37)	(-1.99**)
Unemployment rate	.12	1.24
Temperature	.30	12.86***
Fall season	.06	3.17***
Time trend	.01	4.06***

$R^2 = .95$
$F(12, 31) = 49.54$***
DW = 2.20

**Significant at the 5 percent level
***Significant at the 1 percent level

For the lagged variables, the long-run effects shown in parentheses were calculated by addition of the separate coefficients (this procedure is appropriate because the coefficients are proportional changes). For example, although a one percent increase in heroin price starting in January is associated with a 0.06 percent decrease of property crime that month, the full effect by March is a 0.16 percent increase, once the effects of the higher price in February and March have been added in.

The t-statistics shown in the last column are used to measure the level of statistical significance of the regression coefficients. Higher "t" values (more asterisks) mean stronger evidence that the coefficient is not zero, i.e., that the corresponding independent variable is indeed related to the dependent variable. We regard the 10 percent level (or better) as acceptable evidence, and discuss primarily those coefficients that meet this criterion.

The Effect of Drug Treatment on Property Crime

The signs of the regression coefficients for treatment enrollment and heroin price in table 3 jointly support the two hypotheses of addict behavior advanced earlier. The positive sign on price adds support to the belief that drug users as a class commit property crime to finance their purchases, and that higher prices would lead to higher crime levels.*

Coupled with this finding, the negative sign for treatment enrollment is consistent with the major hypothesis being tested by this research: that treatment reduces the demand for illicit drugs, and therefore the need for stealing. The numerical value of the treatment coefficient is discussed in chapter IV.

In addition, the positive relation between heroin price and property crime provides some indirect evidence of the price dependence of consumption of the drug. One would expect a hypothetical increase in heroin price to reduce the amount of drug consumed through a decrease in the number of users, or in the size of the average habit.** If a 1 percent increase

*The negative relationship between property crime and heroin price in the current month fails to be statistically significant at the 10 percent level by a wide margin.

**We are assuming that, in Detroit, the demand schedule for heroin (quantity demanded as a function of price) changed little during the period of analysis, so that price changes are due to variations in supply. Otherwise, price increases could be associated with increases in consumption.

in price led to a decrease in consumption of (say) 1.2 percent, total expenditure on drugs would fall by about 0.2 percent, and so might the level of property crime.* The positive relation between price and crime therefore implies that consumption tends to fall by less than 1 percent, when price rises by 1 percent. More on the consumption effect is contained in the PRI study referred to earlier.**

The Effects of Other Factors on Crime

The remainder of this section discusses some of the other results listed in table 3. First, we find no evidence that potency influences the crime rate, apart from the effect on price which is accounted for by the standardized price measure.

The negative coefficient for clearance rate lagged 2 months has the obvious interpretation that higher crime rates are followed by a reduction in the number of offenses 2 months later, as previous offenders are convicted and jailed; the mechanism could be either physical removal or deterrence.

The positive coefficient for the unlagged clearance rate cannot be interpreted as solely the effect of clearance rate on crime. We believe that its sign is the result of a large positive "reverse" effect of crime on the clearance rate.*** Despite this bias, the long-run effect is still negative. "Reverse" mechanisms are considered more fully in chapter III.

Some other time-series analyses have found that unemployment increases crime.**** Our results, though in this same direction, are not statistically significant.

*Decreasing expenditure on drugs leads to decreasing needs for revenue from property crime, but the latter is closely related to the number of property crimes: the Detroit crime data shows a simple correlation coefficient of .97 between the number of crimes and the total losses reported by victims.

**Lester Silverman, Nancy Spruill, and Daniel Levine, "Urban Crime and Heroin Availability," Public Research Institute, PRI 75-1, April 1975.

***High crime rates could lead, through citizen pressure, to immediate increases in police aggressiveness and therefore to higher clearance rates.

****See, for example, Fleisher, The Economics of Delinquency, 1966.

The signs and t-statistics of the remaining variables support past observations that crime rates vary positively with temperature, but rise in the autumn of the year.

The figures at the bottom left of table 3 show that the regression equation fits the data quite well. Over 95 percent of the variation in property crime is explained by the independent variables acting together.*

*The F-statistic is significant at the 1 percent level. The Durbin-Watson (DW) statistic of 2.20 shows that the differences between the actual crime level and that predicted by the independent variables are fairly random from month to month.

CHAPTER III

SUPPORTING ANALYSES

ALTERNATIVE RELATIONS AMONG PROPERTY CRIME, TREATMENT AND HEROIN PRICE

The regression coefficients for treatment enrollment and heroin price (table 3) lend support to one hypothesis of addict behavior: addicts steal to buy costly illicit drugs; treatment lessens the need for these expenditures and thus reduces crime. Here we consider the possibility that a different behavioral model may explain the observed data equally well.

The alternative model is that crime is the true independent variable in the relationship, and that changes in the level of crime lead to changes in treatment enrollment and heroin price. The reasoning behind this model is that during months of high property crime, addict criminals have more money to spend on heroin, and consequently less interest in treatment as a way of reducing dependence on it. This "reverse" mechanism would predict a negative relationship between treatment and crime, just as our earlier hypothesis did, but the policy implications would be different: one could no longer assume that inducing addicts to enter treatment would lower the crime rate.

The reverse hypothesis would also predict a positive connection between crime and heroin price, but not in the previous, lagged form: higher incomes resulting from more property crime could lead addicts to bid up the price of heroin, but such a change would have to follow the crime increase, not precede it -- and by 2 months.

As a way of estimating the strengths of both the original and the reverse hypotheses, or mechanisms, we considered an expanded regression model composed of 3 equations that relate crime, treatment, heroin price, and clearance rate.

The first equation is the one we considered earlier with property crime as the dependent variable:*

*Heroin potency, which had no significant effect on crime, was eliminated, to satisfy the statistical requirement that the set of equations be "identified."

(1) Property crime = f (treatment enrollment, heroin price, offense clearance rate, unemployment rate, temperature, fall season, time trend)

The other two equations describe the reverse mechanism. The second regards crime as a "driving variable" which, along with other factors, influences treatment enrollment:

(2) Treatment enrollment = f (property crime, heroin price, drug arrests, time trend)

The number of arrests each month for use and possession of illicit drugs* was thought to be a more direct measure of the "cost of addiction" than is the clearance rate for property crime.

The third equation views property crime as a determinant of heroin price:

(3) Heroin price = f (property crime, treatment enrollment, potency, time trend)

Two major determinants of price could not be used in this equation: drug arrests which add risk premium to the price (omitted for purposes of statistical identification) and the supply of heroin to the city (for which there is no good measure).

For lack of data, we did not estimate an equation explaining the clearance rate. Other researchers have found that the levels of police resources -- such as the number of detectives -- are important determinants of clearance rate, but no monthly measures of such variables were available.

The results of estimating the 3 equations by the method of two-stage least squares** are displayed in tables 4 through 6.

*Including all narcotics, amphetamines, and barbiturates.

**This method is needed only to dissect simultaneous mutual relationships. The result (from table 3) that heroin price is associated statistically with property crime 2 months later is hard to explain in any way other than saying that the price rise causes the increase in crime. That expectations of high future crime would lead to a present bidding up of the price of heroin seems unlikely on its face.

TABLE 4

DETERMINANTS OF PROPERTY CRIME
(July 1970 -- June 1974)

Variable	Coefficient	t-statistic
Property crime (dependent variable)		
Constant	9.25	10.21***
Treatment enrollment	-.24	-6.92***
Heroin price		
Current month	-.06	-.48
Lagged 1 month	.14	1.90*
Lagged 2 months	.10	1.95*
(long run)	(.18)	(2.01*)
Offense clearance rate		
Current month	.68	1.63
Lagged 1 month	-.28	-1.88*
Lagged 2 months	-.72	-3.32***
(long run)	(-.31)	(-1.28)
Unemployment rate	.11	.95
Temperature	.32	7.35***
Fall season	.06	2.74***
Time trend	.01	3.89***

R^2 = .94
F (11, 32) = 49.97***
DW = 2.19

*Significant at the 10 percent level
***Significant at the 1 percent level

TABLE 5

DETERMINANTS OF TREATMENT ENROLLMENT
(July 1970 -- June 1974)

Variable	Coefficient	t-statistic
Treatment enrollment (dependent variable)		
Constant	17.91	4.43***
Property crime		
Current month	-.72	-1.16
Lagged 1 month	-.14	-.17
Lagged 2 months	-.94	-1.63
(long run)	(-1.80)	(-4.30***)
Heroin price		
Current month	.09	.22
Lagged 1 month	.16	.54
Lagged 2 months	-.16	-.52
(long run)	(.09)	(.18)
Drug arrests		
Current month	.32	1.54
Lagged 1 month	.29	1.08
Lagged 2 months	.13	.50
(long run)	(.73)	(3.79***)
Time trend	.07	9.35***

R^2 = .95
F (10, 33) = 69.38***
DW = .32

***Significant at the 1 percent level

TABLE 6

DETERMINANTS OF HEROIN PRICE
(July 1970 -- June 1974)

Variable	Coefficient	t-statistic
Heroin price (dependent variable)		
Constant	1.00	.37
Property crime		
Current month	-.19	-.56
Lagged 1 month	.46	1.06
Lagged 2 months	-.06	-.19
(long run)	(.21)	(.78)
Treatment enrollment		
Current month	-.10	-.40
Lagged 1 month	.55	1.05
Lagged 2 months	-.31	-.67
(long run)	(.14)	(1.48)
Heroin potency	.09	1.55
Time trend	.004	.45

$R^2 = .44$
$F(8, 35) = 3.50$***
DW = 1.60

***Significant at the 1 percent level

We consider first the relation between treatment and crime. Tables 4 and 5, taken together, show that both the "treatment affects crime" mechanism and the "reverse" mechanism are at work. In table 4, we find that an increase in treatment enrollment is associated with a decrease in property crime in the same month;* table 5 shows that increases in crime lead to reductions in enrollment in the long run.

Note that the coefficient of treatment enrollment is only slightly greater in table 4 than in table 3, suggesting that neglect of the mutual relationship in the earlier analysis introduces little bias into estimates of the effects of treatment on crime.

As for the connection between heroin price and crime: tables 4 and 6 show that the "price affects crime" hypothesis has more statistical support than the reverse. The long-run effect of price in table 4 is significant; the property crime variable in table 6 is not.

Other expected findings from the two-stage analysis are that the lagged offense clearance rate is associated with a drop in crime (table 4),** and a rise in drug arrests is associated with a rise in treatment enrollment (table 5).

*In general, the new crime equation will yield different results from the former version (table 3) because of its interactions with the two other equations through the two-stage solution process (and, to a minor extent, because of the omission of the heroin potency variable).

**As we noted earlier, a positive relation is likely between clearance rate and crime in the current month because of a strong "reverse" effect of crime on clearance rate, perhaps through the mechanism of citizen pressure. A positive sign does not imply total absence of any negative relation resulting from the deterrent effects of clearance rate on crime; some crimes are cleared immediately because the offenders are caught in the act. But the reverse effect appeared stronger in table 3.

We did try to dissect the simultaneity between crime and clearance rate by treating the latter as an endogenous variable in this two-stage analysis. This seems to have gone part of the way toward eliminating the bias induced by the circular causation, since the coefficient on the current clearance rate in table 4 has lost its statistical significance. It is still positive, however; we interpret this as a simultaneity bias left over from the two-stage procedure. This is not surprising, since this two-stage procedure (and other simultaneous-equation methods) can only partially eliminate the bias.

This leaves us with a difficult choice: either include the current clearance rate and accept the biased coefficient or eliminate the current term and introduce a bias of another type. We tried each, but, for brevity, reported the detailed results for the former only. The long-run effect of the clearance rate on crime in the latter case is estimated at -.64 (compared with -.31 in the former) with a t-statistic of -3.80 (-1.28 in the former case).

Not all the results met our expectations, however. Unemployment actually has an insignificant effect on crime (table 4), and higher treatment enrollment, which presumably means fewer addicts competing for heroin in the illicit market, does not lead to the expected drop in price (table 6).

We had also expected to find a strong positive link between heroin price and treatment enrollment, but the results in table 5 failed to show one. On reflection, it seemed that heroin price might be associated more closely with inflow into treatment, than with the level of enrollment. The next supporting analysis considers this possibility.

DETERMINANTS OF TREATMENT INFLOW

If treatment is indeed an alternative to drug use, a rise in the price of heroin should induce more addicts to enter treatment, i.e., increase monthly inflow.

We have not looked into the effects of price on treatment outflow, which could depend strongly on other factors, such as clinic policies designed either to discourage unlimited dependence on treatment or to make room for others waiting to enter.*

Note that heroin price can be connected positively with treatment inflow, but not enrollment, since enrollment falls if inflow -- though rising -- is less than outflow.

In relating heroin price to treatment inflow, we took account of other possible explanatory variables:

(4) Treatment inflow = f (heroin price, heroin potency, drug arrests, offense clearance rate, unemployment, time trend)

The independent variables used to explain treatment inflow include two measures of the aggressiveness of law enforcement: Efforts directed specifically at drug users are measured by the numbers of arrests for possession and use of illicit drugs; efforts to reduce property crime are measured by the clearance rate for property offenses.

*The director of the WCDSAS, Dr. Edward Leibson, verified that many treatment agencies do have such policies, encouraging their clients to "make it on their own" after about 6 months. Our retention analysis of individual client records supports his statement. Entering cohorts lose half their people in 6 months, a relation that is stable over time.

Although this analysis deals with monthly measures of citywide aggregates, it differs from earlier work in two respects: The period of analysis starts later, in January 1973; as noted earlier, the WCDSAS did not collect data systematically before then, and rough estimater were not available. Second, to produce more data points, we regarded inflow for each treatment center in the 24-agency sample as a separate measurement. (Figure A-5 in appendix A shows how total inflow for the 24-agency sample varies over time.)

The results of this analysis (table 7) support the expectation that entry into treatment is encouraged by increases in the price of heroin, as well as by a higher arrest rate for drug use. A higher rate of clearance for property offenses has the expected sign, although it is not statistically significant at the 10 percent level.

Higher potency of street level heroin and higher unemployment rate both appear to reduce treatment inflow. People without jobs have less incentive to avoid the disruptive effects of heroin. The reason for the effect of potency is unclear.

USE OF ILLICIT DRUGS WHILE IN TREATMENT

The model of addict behavior suggested in this paper -- that treatment reduces property crime by lessening the use of illicit drugs and the need for money to buy them -- has been tested by its ability to predict highly aggregated data on property crime, treatment enrollment, heroin price, etc. This final supporting analysis provides a more direct check of the assumption that treatment clients reduce their use of illicit drugs while they are enrolled. Client drug use is measured by the results of urine tests administered by treatment agencies, and compared with WCDSAS estimates of use before treatment.

The WCDSAS began monitoring urine tests in November 1973, so that only 8 months of data were available by the June 1974 cutoff for our analysis. For each month, we calculated the fraction of tests showing the presence of morphine (to which heroin quickly metabolizes in the body), quinine (a common diluent for heroin, but also an ingredient in common cold remedies and mixed drinks), methadone, and other drugs. The tests tell whether a specific drug was recently ingested, *but not how much.

*Urine tests can detect morphine and its metabolites up to 16 hours, and methadone up to 24 hours.

TABLE 7

DETERMINANTS OF TREATMENT INFLOW
(January 1973 -- June 1974)

Variable	Coefficient	t-statistic
Treatment inflow (dependent variable)		
Heroin price	.41	1.76*
Heroin potency	-.20	-1.91*
Drug arrests	.46	3.49***
Offense clearance rate Lagged 2 months	1.08	1.31
Unemployment rate	-.24	-.93
Time trend	1.62	2.57**

$R^2 = .30$[a]
F (29, 402) = 5.95***

*Significant at the 10 percent level
**Significant at the 5 percent level
***Significant at the 1 percent level

[a]Of this value, 20 percent is accounted for by the independent variables listed. The remaining 80 percent is accounted for by differences in inflow among treatment centers (represented by dummy variables in the regression).

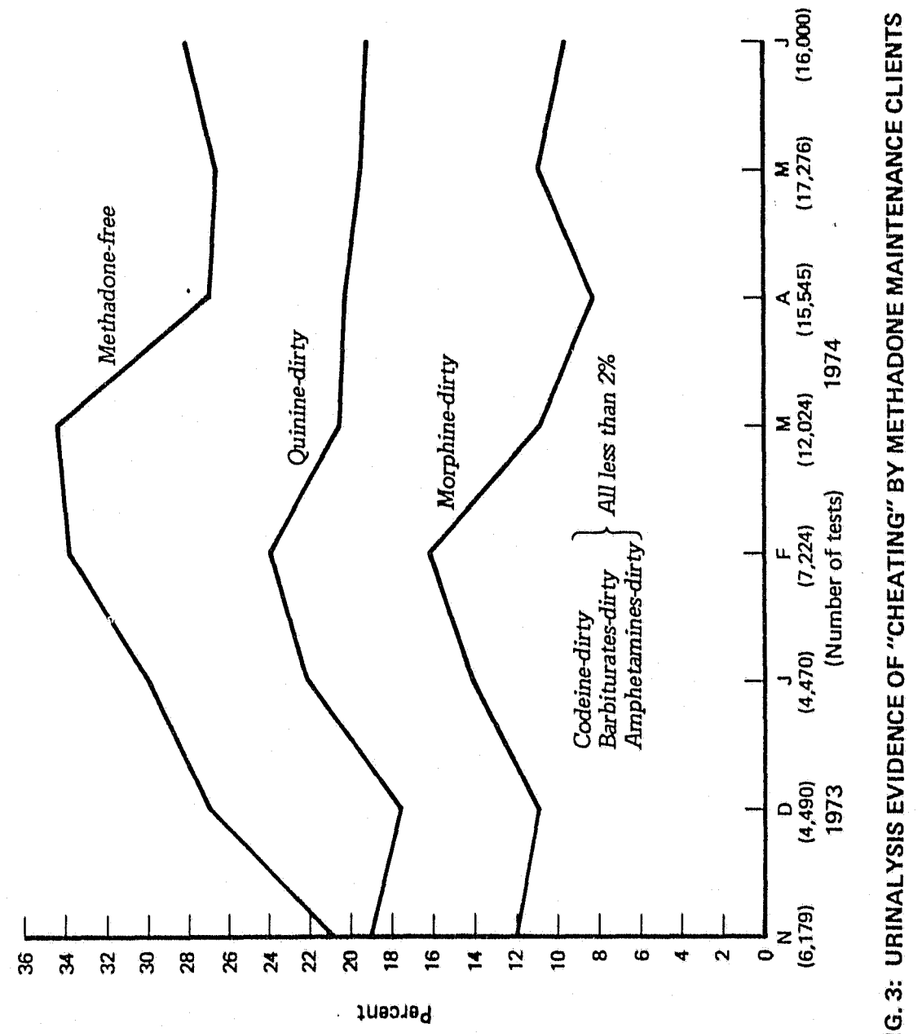

FIG. 3: URINALYSIS EVIDENCE OF "CHEATING" BY METHADONE MAINTENANCE CLIENTS

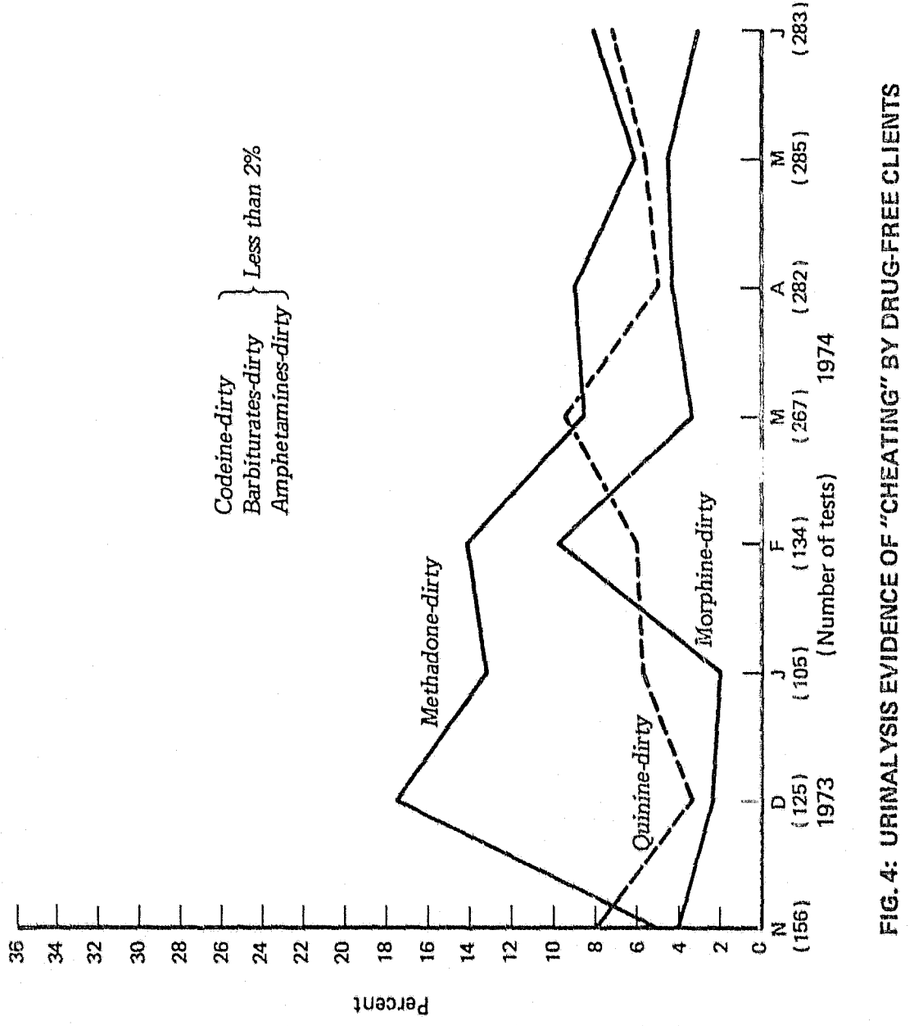

FIG. 4: URINALYSIS EVIDENCE OF "CHEATING" BY DRUG-FREE CLIENTS

Figure 3 shows that over the period analyzed, about 11 percent of the urine tests by methadone clinics showed heroin use, as revealed by the presence of morphine.* Based on these test results, we estimate that 11 percent of the methadone clients used heroin, given the WCDSAS-enforced policy of administering tests randomly across individuals and at unannounced times. (The euphoric effect of heroin is not blocked by the methadone dosage levels typically used by Detroit clinics.)

By comparison, the WCDSAS estimates that almost all methadone clients used heroin before entering treatment. As a requirement for acceptance into methadone maintenance programs, addicts must provide documented evidence (e.g., letters from doctors) of heroin addiction for the two previous years. Moreover, use of heroin at the time of application is verified by needle marks, urine tests showing "positive" for morphine or quinine, and withdrawal symptoms upon ingestion of an anti-narcotic.

Heroin use by clients of drug-free programs is shown in figure 4. Only 4 percent of the tests were heroin-dirty, an even lower percentage than for methadone programs. We therefore conclude that both kinds of treatment lead to a decrease in the use of illicit drugs and a corresponding reduction in the need for money to buy them.

We found it instructive to look at the joint use of heroin (morphine) and methadone by clients of methadone programs. Table 8 shows the statistics over all 8 months. Officials of the WCDSAS suggest that the categories of heroin and methadone use in the table correspond to typical phases in client progression through treatment. New clients who have not yet been weaned away from heroin, use both methadone and heroin (upper left box). As treatment proceeds, clients are induced to give up heroin in return for methadone and the

*An alternative criterion for heroin use would be the presence of morphine, quinine, or both. This criterion would produce a higher, but not necessarily a more accurate estimate of heroin use. Although the presence of quinine would pick up some heroin-dirty urines that failed to show morphine, quinine can be ingested in other ways than as a heroin diluent. Besides, other substances are used to cut heroin. In any case, the broader criterion results in a heroin-use estimate of 27 percent for the high month of February 1974, still low compared with the near-total use by clients before enrollment.

ancillary counselling services provided by the clinic (lower left box). Finally, many clients find the ancillary services a sufficient substitute for drug use, and give up the methadone as well (lower right box).

Assuming that treatment enrollees were randomly chosen for testing, the figures in table 8 imply that clients move quickly into the heroin-free stages, and that many are eventually weaned away from methadone as well as heroin.

TABLE 8

USE OF HEROIN AND METHADONE
(Total methadone maintenance tests
November 1973 -- June 1974)

		Methadone		
		Dirty	Clean	Total
Heroin (Morphine)	Dirty	7,316	1,760	9,076
	Clean	52,246	21,957	74,203
	Total	59,562	23,717	83,279

Of the small percentage of methadone clients who are not taking methadone but who are using heroin (upper right box), some may be selling their methadone to buy heroin. Even for this group, treatment may reduce criminal behavior, not by providing a substitute for heroin, but by indirectly subsidizing purchase of it. Of course, the other users to whom the clients sell the methadone might commit property crime to get the needed cash.* However, these users would probably have committed property crime to pay for some other drug if black market methadone had not been available. Considering clients and other users together, the net effect is still substitution of methadone for heroin and reduction in property crime, although the two effects are no longer associated with the same drug user.

*By the end of 1974, black market methadone had been bid up to about $10 for a typical day's supply -- much lower than the $45 cost of heroin, but still a significant expense for many.

CHAPTER IV

SOCIAL IMPLICATIONS OF THE NEGATIVE RELATION
BETWEEN TREATMENT AND PROPERTY CRIME

Although the analysis reported thus far shows that public drug treatment reduces property crime, final evaluation would require some consideration of the broader issues of whether the benefits of treatment outweigh the cost. Table 9 is a crude comparison of the social value, measured by the reduction in dollar losses suffered by victims of property crime,* with the social cost of treatment measured by the public funds required to provide it.

TABLE 9

DOLLAR COST AND BENEFITS OF PUBLIC DRUG TREATMENT

Public cost of a 1% increase in treatment enrollment

36 additional enrollments (1% x 3,609)

$67,680 added annual cost ($1,880 per filled slot)

Benefits to victims of crime (0.23% decrease in property crime)

289 fewer reported offenses per year (0.23% x 125,700)

602 fewer actual offenses per year (280 ÷ 48%)

$129,430 reduced losses by victims (@$215 per offense)

We start with a hypothetical increase of 1 percent in average enrollment, which represents 36 additional clients.** The $67,680 annual cost to the public is based on an average cost of $1,880, found by dividing the total fiscal year 1974 funding for all WCDSAS agencies by the average enrollment during the year. Because of the birth of new agencies, the $1,880 includes some allowance for capital, as well as out-reach efforts (advertising and recruiting) and other operational costs.

*Dollar losses by victims are, of course, inadequate as a measure of the total dollar costs of crime, which also include public and private expenditures for protection. In addition, there are the psychological costs of fear, for example; these may far exceed the dollar costs.

**To support enrollment of an additional 36 on a continuous basis, treatment centers would have to enroll about 61 additional people a year, given a yearly turnover rate of 1.7 clients per slot for methadone programs (a retention of 12/1.7 = 7.1 months). Because about 98 percent of the clients in Wayne County treatment agencies are enrolled in methadone programs, the much smaller turnover rates (longer retention) of the residential programs have little effect on the average turnover rate for the city.

On the benefit side, the 1 percent increase in enrollment leads to a 0.23 percent decrease in the level of property crime (using the coefficient for enrollment shown in table 3). The factors used in converting this percentage to a drop in dollar losses are:

- 125,700 reported property offenses per year -- 12 times the monthly average from figure 1
- A 48 percent ratio of reported-to-actual offenses, derived by a recent LEAA (Law Enforcement Assistance Administration) study for Detroit property crimes in 1972
- An average net loss of $215 per property offense (initial loss less property recovered).

Because the losses suffered by victims have decreased by more than the cost of treatment, it appears that public funding of drug treatment has been a worthwhile social investment in Detroit in the recent past.

Of course, this simplified calculation ignores many factors that would undoubtedly affect the benefit-cost ratio. The estimated reduction in victim losses would be lower if the reporting ratio for addict crimes were higher than the 48 percent average figure we have used, or if the loss per crime were less than $215. Moreover, one must be careful not to infer that increasing enrollment by forcing addicts into treatment would have the same effect on crime.*

On the other hand, the social benefits of treatment are not fully captured by the resulting reduction in crime. When addicts are fewer, the community's children are less exposed to drug addiction. And public treatment facilities provide services -- psychological counseling, vocational rehabilitation and training, and health services -- that may benefit the community in ways other than reduction of the level of crime.

*Although the treatment population includes some clients whom the courts have sent to treatment in lieu of jail, we did not isolate the effect of these referrals on the crime rate.

Some additional considerations bear on the application of our historical analysis to the future costs and benefits of treatment: Public costs per client may go up, if addict-criminals who are not yet involved in treatment are hard-core users, and outreach efforts are therefore less productive. Hard-core users induced to enter treatment may be less willing to give up heroin for methadone or for drug-free lives. Reductions in property crime per incremental enrollment would also be smaller if the remaining addict-criminal population were more affluent or for other reasons less reliant on property crime for money to buy heroin.

Moreover, an evaluation of public drug treatment should include a comparison with other ways of bringing about a reduction in crime -- for example, through spending more on law enforcement. A final point is that national policy on drug treatment should be based on evaluation in more than one city.

Because of these unresolved issues, the figures in table 9 cannot represent a total evaluation of the social costs and benefits of treatment. Nevertheless, this limited calculation does provide strong support for the public provision of drug treatment.

APPENDIX A

SUPPORTING DATA

APPENDIX A

SUPPORTING DATA

This appendix contains graphs of some of the variables used in the time series analyses of chapters II and III.

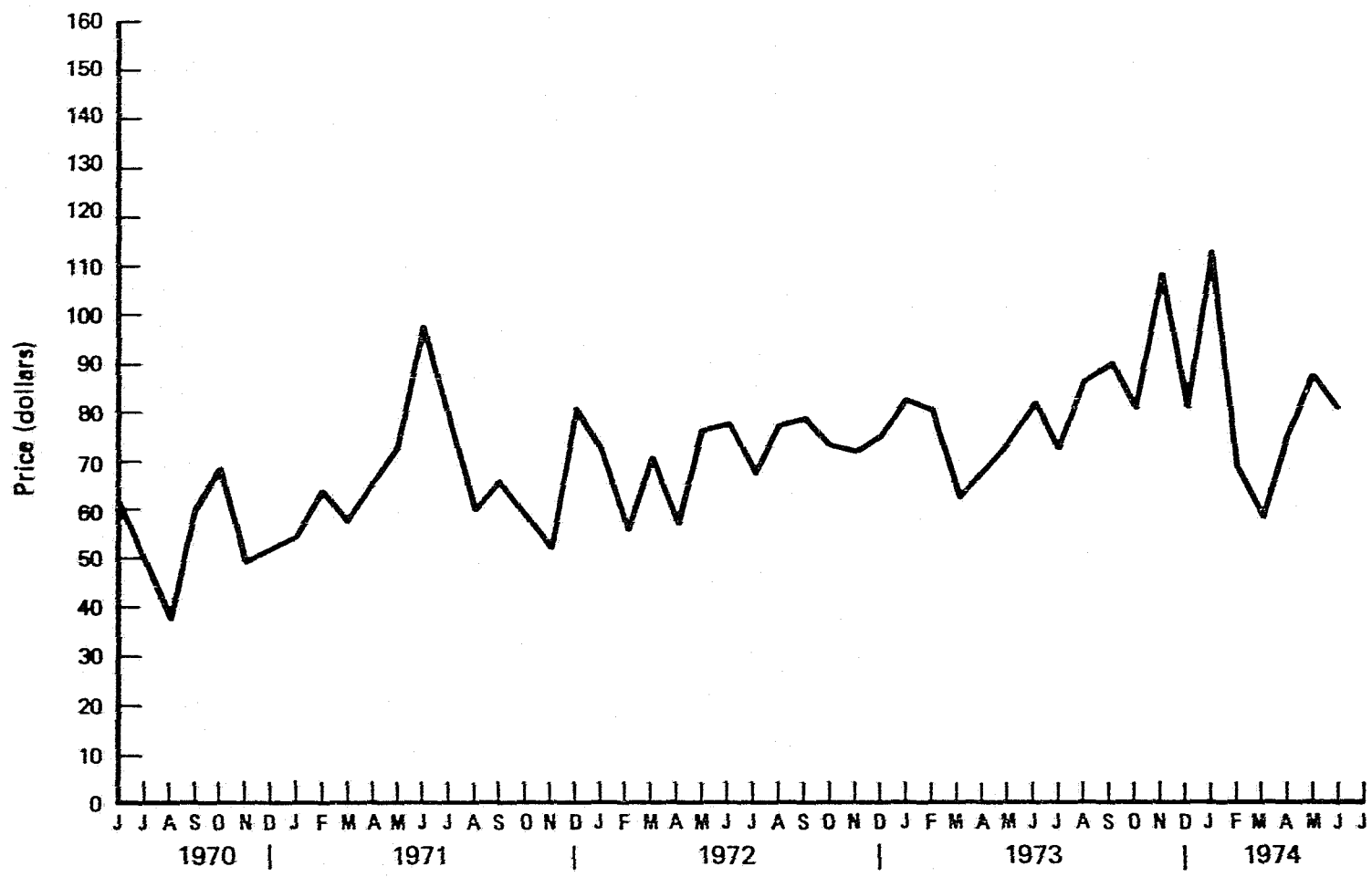

FIG. A-1: PRICE OF STREET LEVEL HEROIN IN DETROIT
(PER GRAM FOR A 2-GRAM, 10% PURE BUY)

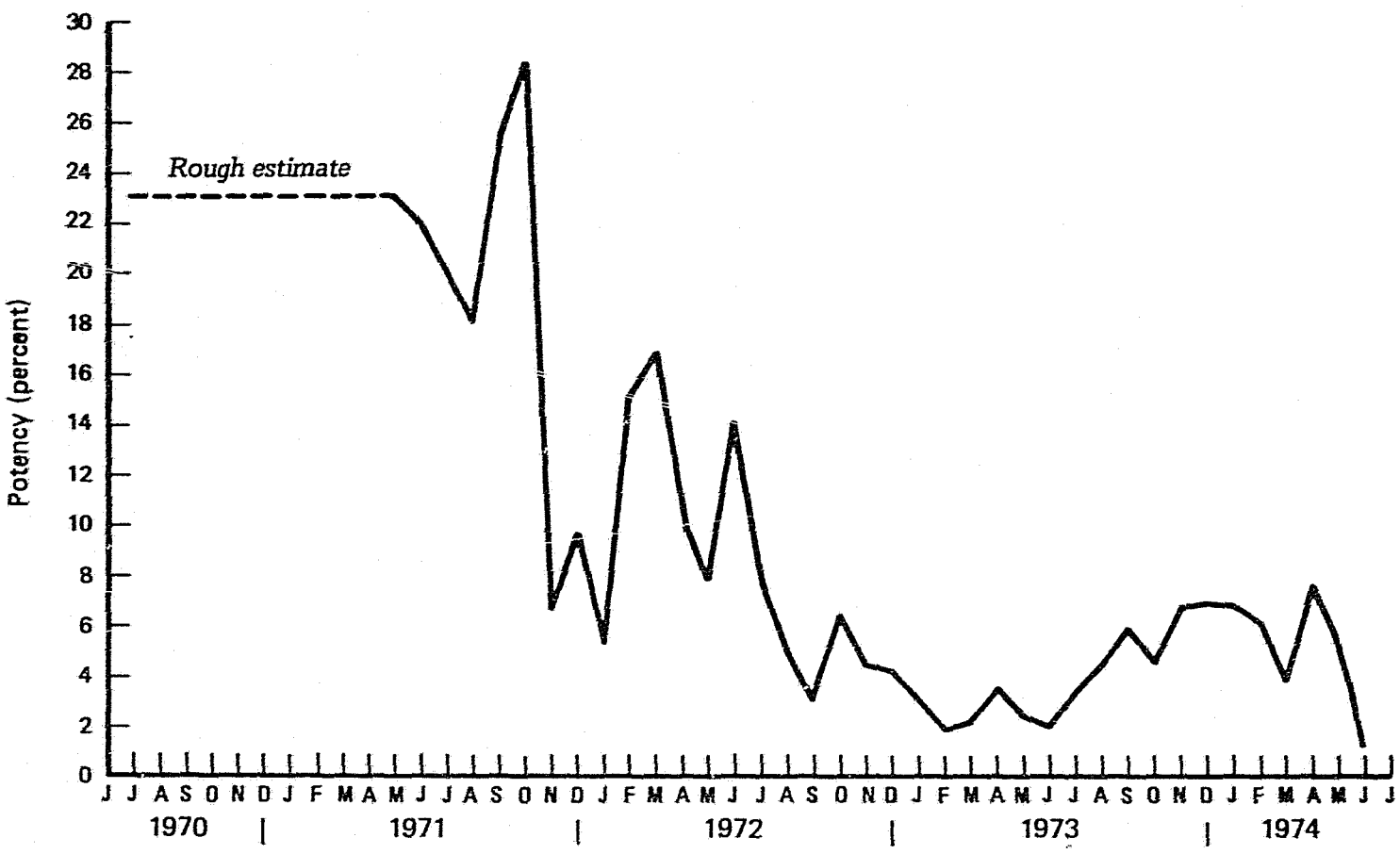

FIG. A-2: POTENCY OF STREET LEVEL HEROIN IN DETROIT
(AVERAGE POTENCY OF ALL MONTHLY PURCHASES UNDER 25 GRAMS)

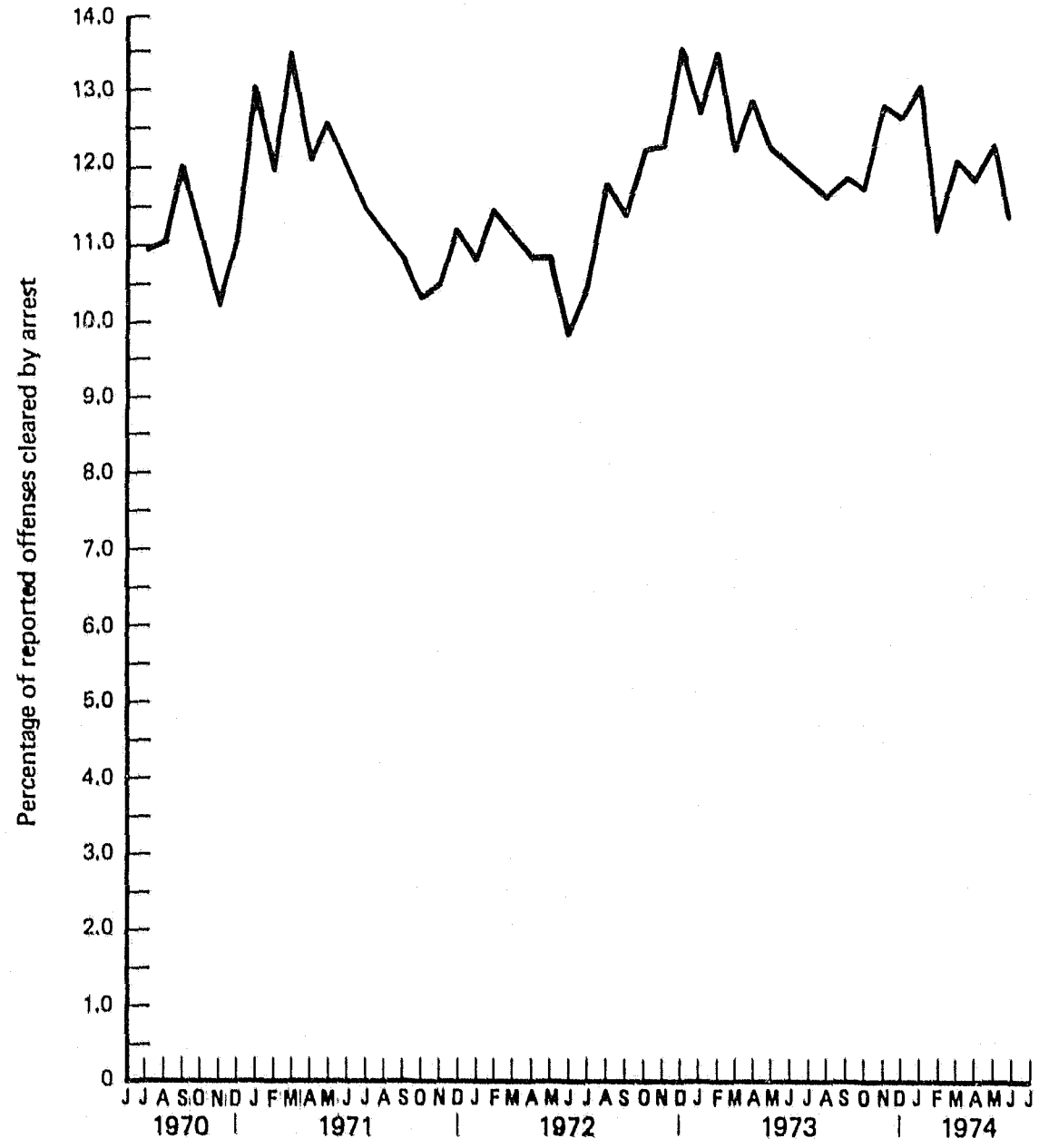

FIG. A-3: PROPERTY CRIME CLEARANCE RATE IN DETROIT

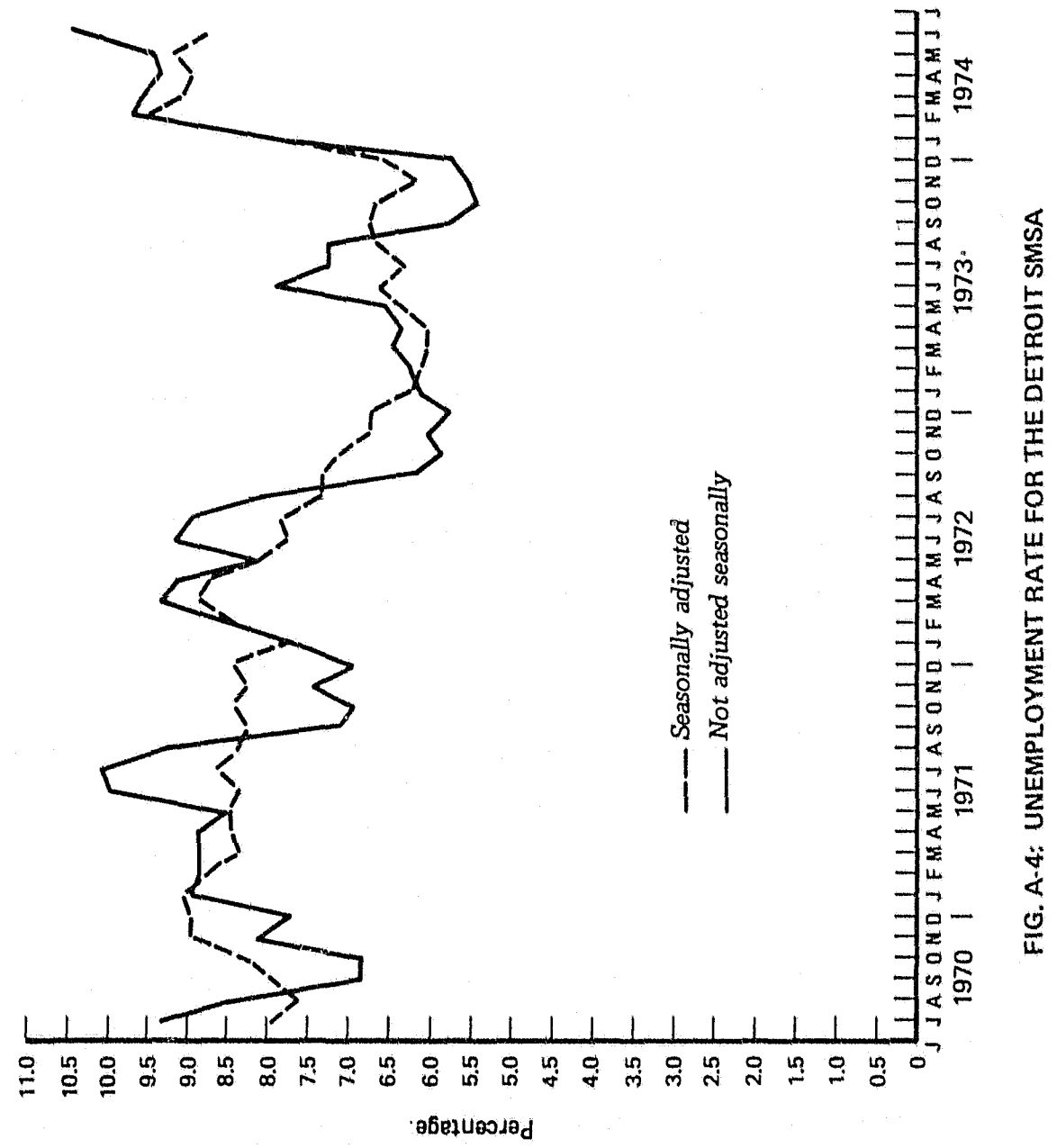

FIG. A-4: UNEMPLOYMENT RATE FOR THE DETROIT SMSA

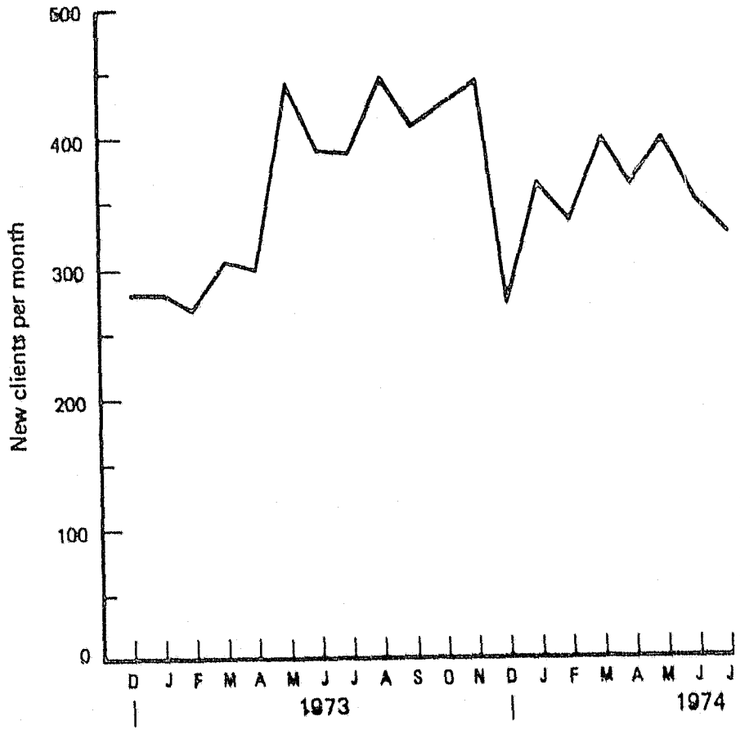

FIG. A-5: TREATMENT INFLOW FOR 24 DRUG TREATMENT AGENCIES IN WAYNE COUNTY

APPENDIX B

CONSTRUCTION OF THE TREATMENT ENROLLMENT SAMPLE

APPENDIX B

CONSTRUCTION OF THE TREATMENT ENROLLMENT SAMPLE

This appendix describes the procedures used for selecting agencies for the treatment sample and discusses the possibility of bias in the sample.

Of the 45 WCDSAS agencies, the 6 listed without agency code in table B-1 were not under WCDSAS long enough to report any information. However, not all of the remaining 39 could be used in the time-series analysis. Two of these agencies are prison programs (agency codes 014 and 015), and were excluded because the behavior of their clients obviously does not fit the general model described earlier. An additional 13 were excluded from the sample because of incomplete reporting.

Twelve of these agencies* were in existence for the full period, but not always under the coordination of the WCDSAS. If they had been included, treatment measures would have depended partly on administrative decisions; this would not have been a pure sample of total treatment enrollment. Including them would have raised our estimate of total enrollment; in actuality, the level remained constant.

Reporting for the remaining agency (agency code 910) was incomplete because it was not in existence throughout the period. Including its small enrollment (under 20) for the 11 months it was in existence would have added little information.

Once the 24-agency sample was selected for use in the time-series analysis, we calculated the total number of clients in treatment on the last day of each month. Dividing these monthly figures by the sampling fraction (48 percent) yielded our estimate of treatment enrollment for Wayne County. The measure of treatment enrollment resulting from the above calculation is shown by the solid line in figure 2 of the main text. Note that the graph is quite linear over the recent period.

*Agency codes 21, 22, 23, 25, 28, 30, 31, 33, 36, 458, 520, 528.

TABLE B-1

TREATMENT CENTERS COORDINATED BY THE WCDSAS[a]

Treatment Center	WCDSAS code	Census tract[b]	Included in WCDSAS data system[c]	Included in 24-agency sample
Alexandrine Dehoco Program (Prison), Northville Township	015		2/73-7/74	
Alexandrine House Outpatient Center, 10 Peterboro	013	31	All	Yes
Alexandrine House (Residential) 4139 2nd. Ave.	586	29	All	Yes
C.A.A.D.A. 10940 Mack Ave.	534	772	All	Yes
Care Clinic, Inc 15232 E. Fenkell		258.01		
Comprehensive Drug Abuse Programs, Inc. 18000 James Couzens		303.02		
Comprehensive Health 1200 Pingree Ct. #6	016	188	All	Yes
Curb Heroin in Plants (CHIP) Program, 8061 Harper		567		
Dearborn Heights Head Center Dearborn Heights Township	440		All	Yes
Detroit General Hospital 1729 St. Antoine	022	508	7/73-7/74	
D.H.D. Southeast Health Center 7351-7359 Gratoit	005	763	All	Yes
Dignity Medical & Cultural Center 6533 E. Jefferson	528	501	1/73-7/73	

[a] Wayne County Department of Substance Abuse Services

[b] A blank signifies location outside Detroit or in Highland Park or Hamtramck

[c] "All" means January 1973 through June 1974. A blank means that the agency was not under WCDSAS administration long enough to submit data

TABLE B-1 (Cont'd)

Drug Abuse Systems, Inc. 7534 Fenkell Ave.	006	263	All	Yes
Harbor Light-Hospital Detox 3611 Cass	025	31	5/73-7/74	
Harper Hospital Methadone Treatment, 3825 Brush		532		
Herman Keifer Hospital 1151 Taylor	001	188	All	Yes
Highland Park Drug Abuse Clinic Highland Park	527		All	Yes
Hutzel Hospital 432 E. Hancock	521	545	All	Yes
Inkster-Hegira Drug Center Inkster Township	536		All	Yes
Inkster-Hegira Therapeutic Day Care Center, Inkster Township	036		11/73-7/74	
Johari House of Model Neighborhood Drug Abuse Program, 525 E. Grand Blvd.		518		
Lafayette Clinic (Ford Motor Co.) 951 E. Lafayette	031	508	10/73-7/74	
Lafayette (General Motors) 13400 West Outer Drive	910	404.10	5/73-4/74	
League-Goodwill, Inc. 1401	033	35	12/73-7/74	
MCHRD Area I Drug Abuse Program 3361 Gratiot	443	524	All	Yes
MCHRD Area II Drug Abuse Program 2610 14th & Pine	444	38	All	Yes
MCHRD Area III Drug Abuse Program 9120 Kercheval	445	757	All	Yes
MCHRD Area IV Drug Abuse Program 1506 Marquette	446	22	All	Yes

TABLE B-1 (Cont'd)

Metro-East Drug Abuse Center 14700 Riverside	902	752	All	Yes
Metropolitan Hospital 1800 Tuxedo	023	175	12/73-7/74	
Narcotic Treatment Institute 2929 W. Boston		181		
Nardin Park Drug Abuse Center 9605 Grand River	519	161	All	Yes
Northwest Guidance Center Jefferson-Chalmers Branch 12928 E. Jefferson	537	754	All	Yes
Northwest Clinic Greenfield Township	442		All	Yes
Pallister-Lodge Clinic (Hospital Detox) 1146 Pallister	021	152	5/73-7/74	
Project Headline 13627 Gratiot	533	671	All	Yes
Project Headline (Outpatient) Services, 13626 E. 7 Mile Road	028	670	8/73-7/74	
Riverside Clinic (Branch of Metro-East) 11730 E. Jefferson	035	755	All	Yes
Romulus Help & Job Placement Center, Romulus Township	458		11/73-7/74	
Seven Mile Health Clinic 19731 W. 7 Mile	017	452.02	All	Yes
Shar Dehoco Program (Prison) Northville Township	014		All	
Shar House (Residential) 1852 W. Grand Blvd.	513	16	All	Yes
Taylor Drug Abuse Center Taylor Township	030		12/73-7/74	
Tri-City DRGC River Rouge Township	529		All	Yes
TWI-DA House 110 Chandler	520	551	1/73-1/74	

Table B-2 presents some general statistics for the 39 WCDSAS treatment agencies and for the entire population of Detroit and Wayne County.

One question of interest is whether the 24-agency sample, from which all the treatment variables in the time-series analysis are derived, is likely to be biased relative to the entire 39 WCDSAS agencies and to the total Detroit treatment population.

Figure B-1 shows that the sample agencies (encircled triangles) are geographically representative of the 39 WCDSAS agencies that reported data.* Each of the 15 agencies not sampled is near one or more of the centers in our sample.

For another check on this point, we looked at how far drug treatment centers reach into the surrounding city to draw clients. Table B-3 provides some evidence that public treatment for methadone maintenance is not a highly localized phenomenon. At the 4 treatment centers analyzed, the percentage of clients living more than 4 miles away varies from 11 to 38 percent. (The more affluent are willing to travel farther.) A circle with a radius of 4 miles includes about a third of the city's area. Table B-3 provides more details.

We have not looked into other possible differences between the 24-agency sample and the other WCDSAS agencies.

How does the sample relate to those centers not under WCDSAS at all? Table 1 in the main text shows that 900 addicts were in treatment at the private "fee-for-service" agencies on September 1974. There is some reason to believe that these addicts differ from those enrolled in the public agencies. Addicts who pay about $25 a week for methadone that they could have received free from public agencies may be more affluent or fearful of supplying personal information. The effect of treatment on their behavior may differ for these or other reasons.

A final point is that different subsets of the treatment population may respond differently to treatment. Two possibly important characteristics for which we have data are prior criminality and the treatment modality for each client in treatment.

Unfortunately, the distribution of these characteristics for our treatment sample shows little variation over time. As an indication or prior criminality, we measured the fraction

*The figure does not include 5 sample agencies that are outside of Detroit but within Wayne County.

TABLE B-2

COMPARISON OF TREATMENT WITH TOTAL POPULATION

	All addicts ever enrolled in WCDSAS agencies from January 1973 to July 1974[b]	Total population: City of Detroit[c]	Total population: Wayne County[c]
Number	14, 000		
Age			
17 and under	2%	32.7%	34.9%
18-22	28	8.4	7.9
23-29	48	8.9	8.9
30-39	17	10.7	11.4
40-49	5	11.3	11.9
50 and over	1	28.0	24.9
Race			
Percentage black	84%	43.7	27.0
Sex			
Percentage male	70%	47.9	48.4
Family income			
not reported	11%		
under $4000	50	15.2	11.2
$4000-$7000	13	14.6	11.6
$7000-$10, 000	14	19.9	17.9
$10, 000-$13, 000	9	17.8	19.2
$13, 000-$16, 000	2	11.7	13.5
Over $16, 000	2	20.7	26.4
Employment[a]			
Employed	34%	52.0	54.3
Unemployed	63	4.0	3.5
School, jail, other	3	43.2	42.2
Source of support			
Salaries and wages	34%		
Welfare	27		
Dependent on others	20		
Other and unknown	19		
Family status			
Percent of married	28%	20.1	19.0

[a] At time of last application for treatment.

[b] A total of 45 centers, less 6 not reporting.

[c] U. S. Department of Commerce, Bureau of Census, 1970 Census of Population and Housing.

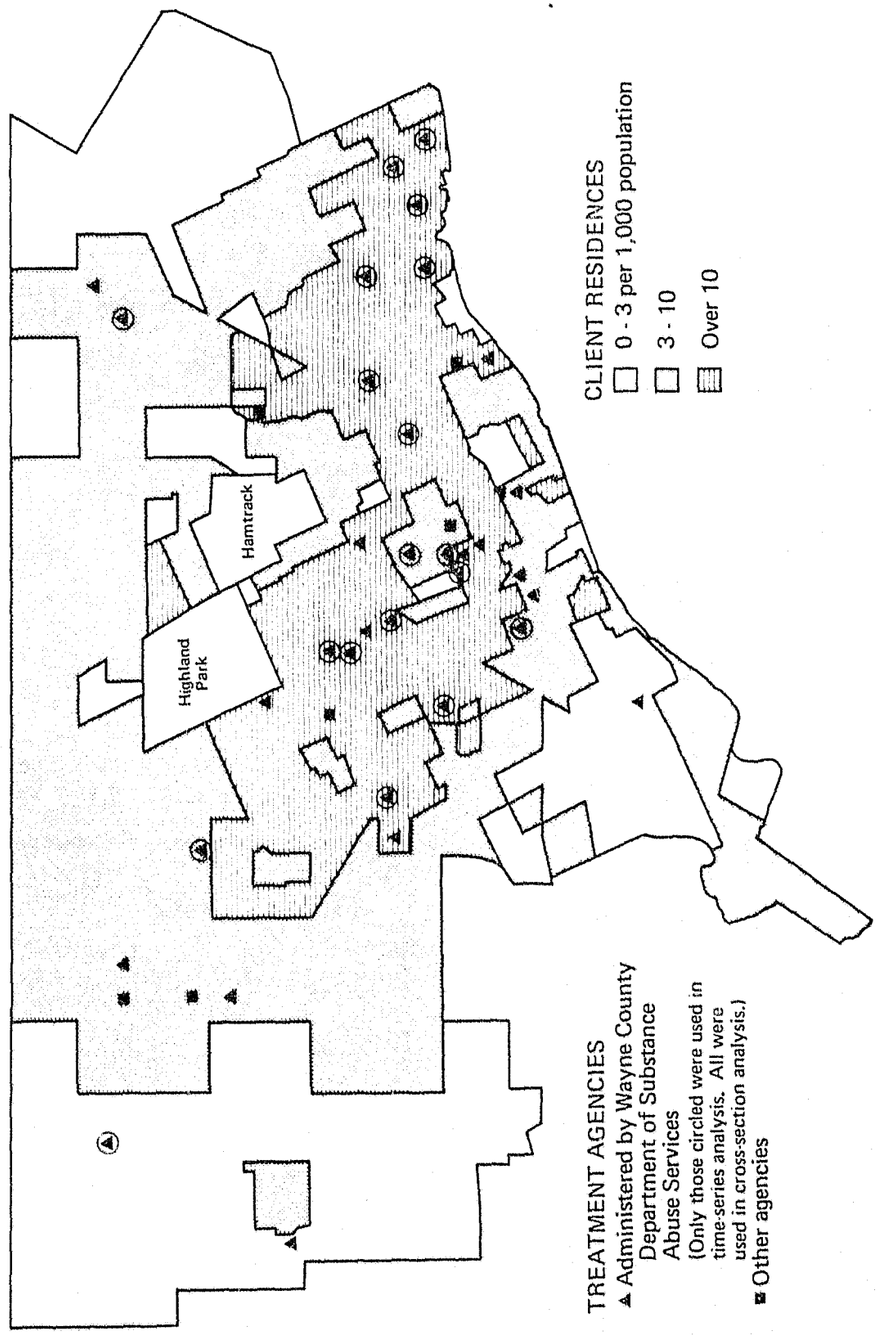

FIG. B-1: TREATMENT CENTERS AND CLIENT RESIDENCES IN DETROIT

TABLE B-3

DISTANCES ADDICTS TRAVEL FOR TREATMENT

	Clinic 1: central city	Clinic 16: central city	Clinic 13: downtown commercial	Clinic 17: affluent Northwest	Mean city mean (std. dev.)
Census tract data					
Tract number	188	188	031	452.02	-
Percent black	95.2%	95.2%	17.1%	0.0%	43.7%
Mean income	$2150	$2150	$3350	$4616	$2597 ($1679)
Percentage of families below federal poverty level	24.7%	24.7%	21.1%	0.7%	8.2%
Percentage of unrelated individuals	10.7%	10.7%	54.5%	4.8%	11.1%
Number of treatment clients per thousand population	23.1	23.1	18.7	1.9	7.8 (6.7)
Monthly number of property crimes per thousand population	7.0	7.0	15.2	2.8	10.1 (21.3)
Clinic data					
Number of clients	1147	194	304	169	
Percentage traveling:					
0-1 miles	21%	44%	31%	12%	
1-2	30	24	11	12	
2-3	18	14	14	20	
3-4	12	7	16	18	
4-5	8	3	10	13	
5-6	4	4	6	5	
6-7	3	-	6	7	
7-8	2	2	3	3	
8-9	1	2	3	4	
9-10	-	-	1	1	
10-11	-	-	-	4	
11-12	-	-	-	2	
12-13	-	-	-	1	
	99%	100%	101%	102%	
Meandistance traveled (miles)	2.4	1.9	3.0	4.3	
Standard deviation (miles)	1.8	1.8	2.3	2.9	

of total clients in treatment who, by their own statements, were on parole or probation or had had some previous interaction with the courts at the time they entered treatment. Over the period for which we have this data (January 1973 through July 1974), this fraction stayed at between 25-27 percent.

The fraction of clients on methadone maintenance, as opposed to any of the drug-free modalities, stayed at 89-91 percent in our sample (98 percent of total population is on methadone maintenance).

END