Monitoring Archival Indicators of Alcohol and Other Drug Harm

A *Fighting Back* Progress Report

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Introduction

The use and abuse of alcohol and other illicit drugs result in a wide range of harm to individuals and communities (Horgan, Marsden & Larson, 1993). *Fighting Back* was designed to provide communities with the resources and technical assistance necessary to combat the substance abuse problems in their own communities. Implemented in 14 sites, the goal of the program was for each community to develop a community-wide effort to reduce the use and abuse of alcohol and other illicit drugs (AOD).[1] This was to be accomplished by all constituents of the community (leaders and grassroots) coordinating efforts across the continuum of care (public awareness or prevention, early identification, treatment, and aftercare). By reducing the number of new users and the number of individuals already using could reduction in harm be achieved.

The National Evaluation of *Fighting Back* (see Saxe et al., 1995a) was designed to examine whether the program had a demonstrable impact on reducing substance abuse problems in these sites.[2] This was done using a quasi-experimental design in which each *Fighting Back* site was compared to a set of similar sites that did not participate in the program. In order to assess the use and abuse of, and harm from, alcohol and other illicit drugs, the following research methods were employed: observational data collected by a community studies team; random-digit-dialing telephone surveys of individuals in the *Fighting Back* and comparison communities; and the collection of archival data by the community indicators team. The present report summarizes the results to date from the community indicators component of the evaluation. The general utility of archival data sources is described, as is the importance of each data source as an indicator of harm from substance abuse.

Archival Sources of Indicator Data

The community indicators were comprised of archival material in the public domain, specifically death certificate records, data from the Fatal Accident Reporting System (FARS), data from the Uniform Crime Reports (UCR), and hospital discharge data. Archival sources such as these have several research benefits that are not afforded by primary data collection methods such as surveys. First, archival data span long periods of time. All of the data sources included in the indicator component of the evaluation are available for many years prior to the advent of *Fighting Back*. Thus, one can examine trends in these indicators across time to determine whether a shift in trend occurred after program implementation. Second, archival data quantify behavior as it occurs naturally. It is often difficult to study negative behavior such as substance abuse because there might be the drive to conceal such behavior from investigators, or the population of interest might be difficult for investigators to reach. For example, a survey can

[1] The sites chosen for the *Fighting Back* program were required to have a population of 100,000 - 250,000 people . In some cases, whole political jurisdictions were not included, but only portions of cities. In other cases, areas surrounding the primary political jurisdiction were added to include more people.

[2] The National Evaluation has collected survey and indicator data from 12 of the 14 sites Table 2. Two sites, Northwest New Mexico and a portion of Oakland, California were not included. The former was dropped because its rural nature and the large population of Native Americans (the site includes a large portion of the Navajo Nation) meant that no reasonable comparison site could be found. The latter site lost its RWJF funding and has only recently been reinstated as a *Fighting Back* site.

provide incidence rates for those who respond to the survey but might have difficulty reaching "heavy" or "hidden" users, who might be inaccessible by phone or who might be unlikely to respond truthfully. It is just such users who might be more at risk of personal harm from substance abuse.

In contrast, community indicators are records of incidents of negative encounters with the criminal justice or other community systems. Thus, they provide measures of harm that are less likely to be confounded by factors such as phone availability or self-presentation. A third benefit of the archival sources examined in this community indicators report is that they provide an additional source of data with which to triangulate on substance use and harm. As Turner and Miller (in press) describe: "... using such a system in tandem with other approaches may give researchers a more accurate view of underlying trends in the prevalence of drug use in the population, trends that are measured with different biases by each data source." The goal of the community indicators study, ultimately, is to integrate the archival analyses with the other sources of information gathered from the evaluation. All sources of information can then be combined to provide an accurate assessment of the *Fighting Back* program construct.

This progress report is taken directly from the stream of data and analyses that are currently underway. Specifically, it reports trends in crime indices, substance abuse related deaths, and traffic fatalities in *Fighting Back* sites and their comparison sites. Data collection and disaggregation continue and their progress is also reported. Rates are presented for the indicators by site and on a composite basis. The statistical strategy is outlined, and examples of its results are presented.

This report also represents the indicator and evaluation strategy envisioned in the original plan, including the input of the Technical Advisory Committee, the special meeting on indicators on February 15, 1995, and ongoing discussion with the Foundation. Final analyses of indicators from the three data sources currently under examination by the Indicators Team will be reported to the Foundation in the Fall of 1997. Assessment of other possible indicators for use in the evaluation will also be touched upon.

Background

Several groups have used indicators to assess substance use and abuse (e.g. Fox, Merrill, Chang & Califano, 1995; Stinson and Debakey, 1992). The continuing work of the Community Epidemiology Working Group of the National Institute of Drug Abuse (National Institute on Drug Abuse, 1990), which systematically monitors drug abuse trends in the 20 largest metropolitan areas in the United States, provides a model. This evaluation builds upon these prior efforts and adapts them to *Fighting Back*. More specifically, the strategy of the *Fighting Back* evaluation regarding the creation of a national system of indicators is similar to that utilized by the Community Substance Abuse Partnerships, (CSAP, 1993).

The process of data collection and analysis for community indicators followed four major steps:

1. Identifying and accessing the indicators;

2. Validating those indicators as reliable measures and imputing missing data when appropriate;

3. Creating substance abuse related rates for each site based on the underlying indicators;

4. Analyzing the trends in those rates by relating them to other data such as demographics, survey results and community studies results.

To ensure that such indicators were comparable from community to community and over time, conditions for reporting had to be established and met:

1. The sources for recording the incidents were accessible;

2. The incidents were compiled into various public reports, so that the relationship between the report and the sources was clear;

3. The recording of the incidents was based upon a generally accepted classification system.

These considerations led directly to our strategy for selecting the sources of data and indicator creation.[3]

Selecting the Sources of Data

Beginning with the set of potential indicators outlined in Saxe et al. (1994a), the literature was reviewed for examples of various sources used to create indicators of alcohol and other drug use. In addition, officials of the Substance Abuse Mental Health Services Administration (SAMHSA), the National Institute on Drug Abuse (NIDA), and the National Institute of Justice (NIJ)--organizations with experience developing such indicators--were consulted. Discussions were held with the Federal Bureau of Investigation (FBI) and the National Center for Health Statistics (NCHS) regarding their archived data. Additional assistance was received at a meeting of the Community Epidemiology Working Group (CEWG) sponsored by NIDA, as well as at a specialized conference run by the Center for Disease Control and Prevention (CDC) on small area statistics.

To be selected as a source of indicator data the following conditions had to be satisfied:

1. The importance of specific data as an indicator of the communities' substance abuse problems had to be demonstrated;

2. The data--which would yield valid measures of the indicator--had to be available;

[3] This report only discusses the analysis of comparable indicators that were collected or available at all or a large number of sites. The use of more local indicators that are based in one or another site are reported in work detailing the cross site analysis.

3. The method of data collection had to follow a common protocol across *Fighting Back* and comparison sites;

4. Historical data, predating *Fighting Back*, had to exist in nearly all of the sites.

These criteria immediately led to the rejection of a series of indicators that initially seemed quite attractive. These included emergency room visits, medical examiner reports of drug abuse of decedents, the monitoring of drug use by newly arrested prisoners, discipline incidents in schools, drop-out rates, the volume of alcohol sales, and the number of alcohol outlets. In each of these cases, comparable data did not exist in a sufficient number of sites.[4]

Indicator Development

Only established methods were used to develop the indicators. Through the use of computer programs to construct the indicators, questions of recording biases and recording gaps were systematically addressed. The indicators were created from information based upon locally recorded data that were then compiled as electronically archived data sets. The data had to be directly relevant to alcohol and other drug harm and use, gathered from systems that have been in place for many years, and subjected to various validity and reliability analyses. The indicators have been disaggregated (where possible) with respect to age (with special attention paid to youth related issues), as well as with respect to area of coverage, sex, race, occupation or income, and ethnicity.

Most data of interest were electronically archived at the state or national level and were available from 1980 or earlier. Information available from 1985 to the most recent release were used. Thus, at least for some indicators, an 11 year trend was available to assess the impact of

[4] The indicators that the Substance Abuse and Mental Health Services Administration sponsors include: the National Household Survey of Drug Abuse(NHSDA), Drug Alert Warning Network (DAWN), and Monitoring the Future (MTF). The first is a random in person sample of individuals in households 12 and older. It is the "gold standard" of survey drug measures. It has been an annual survey since 1988. It is the norm which is used to benchmark the National Evaluation's own telephone survey.
DAWN consists of two data collection efforts. The first is a sample of hospital emergency rooms. The drug mentions of each individual during selected periods are coded. The second is a sample of medical examiners in large metropolitan areas. Drug related deaths that come to the attention of the coroner are reported. No public use file exists of either set of data. Discussions with officials at SAMSHA made it plain that implementing a version of DAWN in the *Fighting Back* sites and comparisons would be very expensive and could not reliably garner information before implementation began. The data collected by DAWN only applied to a few of the sites and comparisons.
MTF is a survey of adolescents in school. The National Evaluation's school survey effort is an attempt to acquire similar data.
The Bureau of Justice Statistics sponsors Drug Use Forecasting (DUF), which takes urine samples and hair samples from recently arrested individuals at several selected times during the year. The national evaluation reviewed DUF and considered implementing a similar protocol in the 12 *Fighting Back* evaluation sites and the 29 comparison sites. As with a mini-DAWN such efforts were likely not to be universally accepted, were of very high cost, and did not allow the collection of historical data.

Fighting Back. The plan resulted in indicators that were directly related to the goals of the *Fighting Back* initiative and were of use to the sites themselves. The evaluators originally identified several potential data sources from which to develop indicators of alcohol and other drug harm and use. The indicators and their sources are summarized in Table 1.

Table 1 - Core Community Indicators Data Sources

Indicators	Source
Health Care System Encounters	
AOD-Related Deaths	Mortality Files from State and National Sources (NCHS)
AOD-Related Hospital Stays	State Hospital Discharge Data Tapes
Traffic Related Encounters	
Single Vehicle Nighttime Fatal Traffic Crashes	Fatal Accident Reporting System (US DOT)
Criminal Justice System Encounters	
Index Offenses	State and Local Police Agencies, Uniform Crime Reports, Offenses File

Data Sources and Sites

Each of these sources exists at three geographic levels of the data collection system: local, state, and national. In some cases, complete data were found at the local level, while only samples were at the state and national level. In other cases the data at the local level fed directly into state and national systems. Data were often accessible but with different levels of aggregation or different degrees of geocoding at each level. Demographic data for the was also collected communities in order to better understand the context in which *Fighting Back* operates.

A particular difficulty that affected all data sources in one way or another was the definitions of the *Fighting Back* sites and their comparison sites. Table 2 lists the sites and the comparison sites.

Table 2 - *Fighting Back* Sites and Comparisons

Name Of Site	Status Of Site
Little Rock, Arkansas	*Fighting Back* Site
Fort Smith, Arkansas	Comparison Site
Pine Bluff, Arkansas	Comparison Site
Vallejo, California	*Fighting Back* Site
San Bernardino, California	Comparison Site
Stockton, California	Comparison Site
Santa Barbara, California	*Fighting Back* Site
Carlsbad, California	Comparison Site
Redondo Beach, California	Comparison Site
Santa Monica, California	Comparison Site
New Haven, Connecticut	*Fighting Back* Site
Bridgeport. Connecticut	Comparison Site
Hartford, Connecticut	Comparison Site
Waterbury, Connecticut	Comparison Site
Washington, D.C.	*Fighting Back* Site
Baltimore, Maryland	Comparison Site
Worcester, Massachusetts	*Fighting Back* Site
Fall River, Massachusetts	Comparison Site
Lowell, Massachusetts	Comparison Site
Springfield, Massachusetts	Comparison Site
Kansas City, Missouri	*Fighting Back* Site
Columbia, Missouri	Comparison Site
Springfield, Missouri	Comparison Site
St. Louis, Missouri	Comparison Site
Charlotte, North Carolina	*Fighting Back* Site
Greensboro, North Carolina	Comparison Site
Raleigh, North Carolina	Comparison Site
Winston-Salem, North Carolina	Comparison Site
Newark, New Jersey	*Fighting Back* Site
Camden, New Jersey	Comparison Site
Jersey City, New Jersey	Comparison Site
Columbia, South Carolina	*Fighting Back* Site
Charleston, South Carolina	Comparison Site
Greenville, South Carolina	Comparison Site
San Antonio, Texas	*Fighting Back* Site
Dallas, Texas	Comparison Site
Fort Worth, Texas	Comparison Site
Houston, Texas	Comparison Site
Milwaukee, Wisconsin	*Fighting Back* Site
Madison, Wisconsin	Comparison Site
Racine, Wisconsin	Comparison Site

Since a population size of 100,000 to 250,000 was called for, some of the entities receiving *Fighting Back* program funds targeted only a part of a political jurisdiction. Indicator data, by and large, are available at either the political jurisdiction level or at the zip code level. In some cases, both types of geographical information are provided. Both types of reporting areas, as well as the structure of the indicator data itself, lead to reporting difficulties. Some data report events that happen in a given area (e.g. police reports), but do not have information on where the individual who caused the event lives. Thus, burglary in a suburb or "nice neighborhood" could be carried out by an individual living in a *Fighting Back* area. Other data are available based upon residence, but one does not easily have the data on where an event occurred.

For those indicators based upon zip codes, a further problem is that zip codes do not provide an exact match to *Fighting Back* areas. Selection of zip codes, therefore, was based upon them containing a population that was at least 60 percent within the *Fighting Back* area. Furthermore, zip codes change. Of the 12 sites and 30 comparison sites, four *Fighting Back* sites and eight comparison sites had significant change from 1994 through 1996. Even more changes had occurred since 1990.[5] As a result, substantial effort is invested into disaggregating data by *Fighting Back* area, as well as by relevant political and other geographic areas. A series of denominator data have been created for zip codes, zip based sites, political subdivisions, including police precincts and wards, and sites defined in terms of census tracts. Estimation methods have been applied to make the demographic data current for each of the specific areas.

The *Fighting Back* evaluation may be unique in its emphasis on the collection of indicator data and its application to the evaluation of a program which targets many relatively small areas. The experience of the evaluation may give guidance to others charged with evaluating other targeted community based programs.

Statistical Model for Indicator Data

The indicator data has been aggregated to yearly totals (or rates or averages, where appropriate) in order to eliminate seasonal trends. These trends are highly irregular for at least some of the outcome variables being used. Seasonality would therefore be difficult to model well. Such a high level of aggregation also eliminates or greatly reduces any possible autocorrelation in the data.

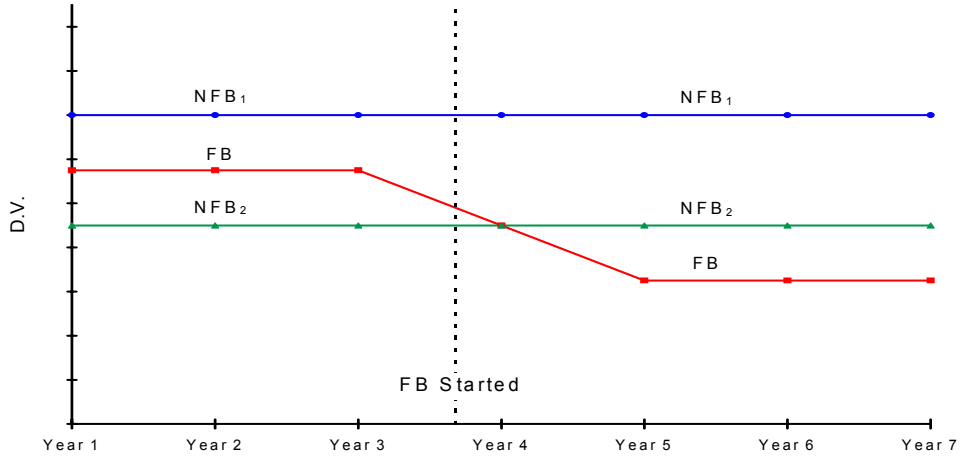
The rates are used as the outcome variable. For data with lower rates of occurrence, an adaptation of models for frequency data that include a base will be used (see Haberman, 1978).

An idealized representation of possible results for indicator data is presented in Figure 1

[5] A further problem with zip codes are the so-called "point zips." In some cases, these include significant portions of the population, for example when they include a whole apartment building. This was very rare in the sites used. In most cases, these are places where people receive mail at a Post Box. Because of this one does not know where such people live. Fortunately, according to analyses of the FARS data very few individuals list a non-residential "point zip" as their residence. Such zip codes were eliminated from analysis here and from the survey.

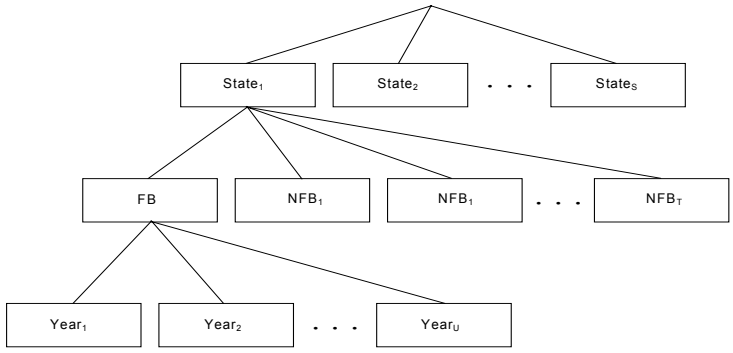
to motivate the statistical representation of the model. The data from each site form a short time series, with the *Fighting Back* sites forming interrupted time series. Note that "FB" indicates *Fighting Back* sites, and "NFB" indicates comparison sites. Implementation was assumed to have occurred in 1992.

Figure 1. Predicted Pattern of Results for Indicator Data



The general structure of the indicator data is a three-level hierarchy represented in Figure 2. Time points (level 1) are nested within communities (level 2). Communities are in turn nested into groups of communities (level 3). As shown in Figure 2, "State" indicates the set of a *Fighting Back* site and its matched comparison sites. Once again, this data structure leads to a three-level statistical model, presented below.

Figure 2. General Structure of Indicator Data



The statistical model can be written as follows:

Let i represent a time point,
j a community,
k a group of communities (1 *Fighting Back* site and its set of control sites)

*Fighting Back(*j) = 1 if a community is a *Fighting Back* site,
0 if a community is a control site.

Let y(ijk) be the outcome at time i, in community j, within group k.

The Level 1 model, which specifies the frequency or rate of occurrence (as appropriate) as a function of time-varying predictors, is:

$$y(ijk) = b(0jk) + b(1jk)\ T(ijk) + b(2jk)\ P(ijk) + b(3jk)\ TP(ijk) \ldots + e(ijk)$$

where: T(ijk) represents time (i.e., a linear effect of time),
P(ijk) is a dummy variable which equals 0 before the *Fighting Back* program was started, and which equals 1 after the *Fighting Back* program was started, and
TP is the product (interaction) of time and program implementation.

The regression weights, represented by b(.jk), are allowed to vary from site to site. Variation in these regression weights is then modeled as a function of site-level characteristics. In this equation, the e(ijk) are residuals that are assumed to have a constant variance across sites. They may have non-zero covariance within sites across time (autocorrelation).

The Level 2 model, which specifies the regression weights from the Level 1 model as linear functions of site-level characteristics, represented as W.(j), and *Fighting Back* status, represented as *Fighting Back*(j), is:

$$b(0jk) = g(00k) + g(01k)\ \textit{Fighting Back}(j) + g(02k)\ W1(j) \ldots + U(0jk)$$

$$b(1jk) = g(10k) + g(11k)\ \textit{Fighting Back}(j) + g(12k)\ W1(j) \ldots + U(1jk)$$

etc.

The W.(j) represent site-level characteristics, such as demographics (e.g., percent black, percent blue-collar) or other potential predictors of or influences on drug usage.

The U(.jk) represent residuals at Level 2, which have variances to be estimated, as well as covariances among them to be estimated. These residuals are assumed to be uncorrelated with the residuals at other levels.

The Level 3 model is:

$g(00k) = h(00) + V00(k)$

$g(10k) = h(10) + V10(k)$

etc.

The models have been fit using the MLn software developed by the Multilevel Model Project (Goldstein, 1995; Goldstein & Rosbach, 1996). This software fits both linear and logistic hierarchical models. An example model is presented below for crime data. More complex 4 level models using individual level data as well as the three levels shown are being developed for some of the indicators at this writing, particularly those for the Substance Abuse Death data and Fatal Accident Reporting System data. Complex models of crime data that consider both the political subdivision where a site is located as well as the specific areas either designated or targeted by the sites are also being developed. Crime data for virtually all *Fighting Back* sites and comparisons that are designated as significantly smaller than political subdivisions are either in hand or on the way from their respective law enforcement agencies.

For an effect to be noted, not only will there need to be a statistically significant change in an indicator, but that change, as modeled, must also deviate from the trends found elsewhere among the non-*Fighting Back* sites.

Encounters with the Criminal Justice System

Drug related crime is one of the most obvious consequences of substance abuse and is one of the concerns of the program. The evaluation tracked crime using information collected and archived in the Uniform Crime Reports, and is using it along with locally available data to disaggregate crime data to more precise areas. The availability of incident based data is being explored. Although reported and actual crime rates often vary, the national evaluation team has correlated survey responses to questions on crime victimization with crime indicators based upon reported crime (see Kadushin, Killworth, Bernard & Berveridge, 1997).

Research supports the view that crime is closely related to drug use (McBride & McCoy, 1993; Harrison, 1992; Harrison & Gfroerer, 1992; Fagan, Joseph & Cheng, 1990). Data from the Drug Use Forecasting (DUF) system indicate that well over half of all arrestees are using an illegal substance at the time of arrest (National Institute of Justice, 1994). Studies of prison and jail inmates report that 35% of state prisoners, 27% of convicted jail inmates, and 39% of incarcerated youths admitted to being "under the influence" of an illegal drug at the time they committed their crime. Arrestees were tested for drug use in 23 cities using urinalysis. Researchers found that at least half of the arrestees tested positive for the use of an illegal drug in 18 of the 23 cities, with a high of 78% in San Diego, California, and that cocaine was the most frequently detected drug (Harrison, 1992). In a survey of 5,785 local jail inmates, 16% of jail inmates reported using drugs at the time of the offense, and 26% reported using alcohol at the time of the offense (Mays, Field & Thompson, 1991). These studies illustrate the high prevalence of drug use among those entering the criminal justice system.

The relationship between cocaine use and violence in New York City was examined using data from two ethnographic studies completed between 1984 and 1987 (Goldstein, Belluci, Spunt & Miller, 1991). The authors found that males who used the most cocaine were more likely to commit crimes. Furthermore, males in the "big user" category committed a disproportionate share of violent events; they represented 22% of the total sample, yet committed 43% of the total number of violent events. Women who used cocaine, on the other hand, were more likely to be the victim of a violent event then women who did not use cocaine. Another study found that as drug use increased, so too did the addicts annual income from property crimes. Furthermore, narcotic addicts committed an average of 248 crimes per year, yet while in treatment for their drug problem this number dropped to 41 (Harrison, 1992). In a study of crack and crime in Miami, 254 youths committed an astounding total of 223,439 crimes within one year; 61% of these crimes were for drug sales, 23.3% for property offenses, and 4.2% were for major felonies such as robbery, assault, burglary, and auto theft (Inciardi & Pottieger, 1991).

The relationship between drugs and crime in the *Fighting Back* sites has been reinforced by much of the fieldwork from the community studies as well as the analysis of strategies of sites. Several sites have worked for neighborhood campaigns to get the crack houses or drug dealers out of neighborhoods. As will become apparent below in the section on local indicators and the integration of survey with indicator data, where data on crime and drugs exist on a localized basis, very obvious patterns come to light.

Given the strong evidence linking drug use to crime, the evaluation of *Fighting Back* included an examination of crime rates within each of the *Fighting Back* and comparison communities. A description of the data used and results follow.

Tracking Crime by Community: The Uniform Crime Reporting System

The Federal Bureau of Investigation maintains a voluntary national system to monitor the state of crime in the United States. Called the Uniform Crime Reporting System (UCR), it consists of four interrelated data collection activities, each of which is available in machine readable form.

- Offenses Known and Clearances by Arrest includes monthly data on the number of Crime Index offenses reported, the number of offenses cleared by arrest or other means, and the number of adults and juveniles arrested. The count includes all reports of Index Crimes, excluding arson, received from victims, officers who discovered infractions, and other sources.

- Property Stolen and Recovered data are collected on a monthly basis by all UCR contributing agencies. These data, aggregated at the agency level, report on the nature of the crime, the monetary value of the property stolen, and the type of property stolen. Similar information on property recovered is also included.

- The Supplementary Homicide Reports provide incident-based information on criminal homicides. Provided monthly by the UCR agencies, the data contain

information describing the victim of the homicide, the offender, and relationship between the victim and offender.

- Police Manpower Data provide information on staffing of police departments and deployment for all police agencies in the United States.

Virtually all police agencies in the United States participate in the UCR data collection. These data produce the well known crime rate figures that are reported nationally, and also reported at various state and local levels. Since this reporting system has been in place since the 1930s, many police departments also report similar information at lower levels of aggregation, such as precinct or ward. The UCR report often enables each local law enforcement agency to aggregate its own data. As such, it can be disaggregated to the areas participating in *Fighting Back*. Limitations on the use of the Uniform Crime Reports data are well-known (Schneider & Weirsema, 1990). Nonetheless, such data do provide a source of relatively comparable policy level information. The national compilation also has information on coverage and coverage gaps.

For the *Fighting Back* evaluation each of these sources was reviewed for relevance. The Special Homicide Reports were presented in the Interim Report (Saxe et al., 1995b) The relevance of the Property Stolen and Recovered data are not strong. The most important file used from the UCR data collection is Offenses Known to Police and Clearances by Arrest. It is from these data that crime rates are computed. It is the most frequently used and most consistently reported of all the UCR data. Since each *Fighting Back* site may have more than one agency reporting crime, and in some cases the *Fighting Back* site only encompasses a portion of that jurisdiction, it was important to use a source that could potentially be disaggregated. Throughout this report a standard nomenclature has been adopted to refer to *Fighting Back* and the comparison sites. The sites and comparison sites are those listed in Table 2 (see p. 6). For the crime data, sites are defined in terms of their political boundaries and will be disaggregated, where possible, to reporting areas that match *Fighting Back* and comparison sites.

The reporting agencies involved for each site are reproduced in Appendix A. For the purposes of this report, rates for the whole political jurisdiction or jurisdictions are reported. Disaggregation to smaller *Fighting Back* area is continuing, along with a confirmation of the data in the Uniform Crime Reports machine readable file.

The acquisition of the crime related data followed these steps:

- Access each of the UCR files from 1980 through 1995.
- Create a common format for all files. There are some 1,300 variables for each year. The data are reported for over 30 specific offenses, all arrests and juvenile arrests by offense and month, along with a series of other variables, including reporting flags. The format varied from year to year in an inconsistent manner.
- Aggregate offenses, arrests and juvenile arrests for the relevant political subdivision.

- Send a copy of the totals by offense, arrest and juvenile arrest for the period 1985 to 1995 for review by the agency, along with a request for disaggregation of the data. All sites chosen, except for Worcester for a few years in the 1980s, reported data virtually every month to the UCR program. (A copy of the letter sent to each agency is reproduced in Appendix A.)
- Map the areas of disaggregation and relate to *Fighting Back* site, if relevant. (This is ongoing.) Data has been collected from all sites which are part of a political subdivision, except for Milwaukee. Discussions with the Milwaukee Police Department are continuing.
- Compute relevant denominator data for the *Fighting Back* site, if relevant. (Also ongoing)
- Compute rates for the *Fighting Back* sites. It should be noted that in all cases where a site is part of a political subdivision, a larger proportion of crime occurs in the *Fighting Back* site than elsewhere in the community, so some of the rates presented below are understated.

The UCR Index Crimes

The UCR index crimes consist of seven offenses that are used to measure rates of crime as reported to law enforcement agencies across the nation. The seven offenses include the violent crimes of murder/nonnegligent manslaughter, forcible rape, robbery, and aggravated assault, and the property crimes of burglary, larceny-theft, motor vehicle theft, and arson. (The crime of arson was not included in the *Fighting Back* analyses since it is not provided on the national file of data.) Violent crimes involve force or threat of force; property crimes involve the taking of money or property without the use of force or threat of force. A brief description of each crime as defined in the UCR program follows.

Violent Crime

Murder/nonnegligent manslaughter is defined as the willful (nonnegligent killing) of one human being by another and is based only on police investigation as opposed to court, medical examiner, coroner, or jury determinations. It does not include deaths caused by negligence, suicide or accident; justifiable homicides; and attempted murder, which is classified as aggravated assault.

Forcible rape is the carnal knowledge of a female forcibly and against her will. This crime includes attempted rape by force or threat, but does not include statutory rape or other sex offenses.

Robbery is defined as the taking of valuable property from the control of another person using force or the threat of force or violence. Attempted robbery is included in this classification.

Aggravated assault is the unlawful attack of another with the intent of inflicting severe or aggravated bodily injury. It is usually accompanied by the use of a weapon or by means likely to produce death or great bodily harm. Attempts are also included.

Property Crime

Burglary is the unlawful entry of a structure to commit a felony of theft. The use of force is not required for this classification.

Larceny/theft is the unlawful taking of property from the possession of another. It includes such crimes as shoplifting, purse-snatching, thefts from motor vehicles, etc., in which there is no use of force, violence, or fraud.

Motor vehicle theft is the theft or attempted theft of any motor vehicle.

Results

Offenses, juvenile offenses and arrests were all classified using the index crimes. For the purposes of this report, the focus will be on "Offenses Known to the Police"; specifically, crimes that are reported to the police. Figures 3 through 10 present the rate of crime on a composite basis for all *Fighting Back* sites compared to all comparison sites. As evident from the figures, the crime patterns of *Fighting Back* sites and comparison sites seem quite similar, both before and during the initial years of implementation of the program.

Similar charts for each *Fighting Back* site and its respective comparison sites are reproduced in Appendix B. There are some differences, but in general the patterns in *Fighting Back* sites and those sites chosen for comparison seem quite similar. When viewed in terms of reporting district, those *Fighting Back* sites (and some of the comparisons) that comprise less than an entire political subdivision will have a higher crime rate. Indeed, in several cases, preliminary work with disaggregation confirms this. However, patterns of change will in all likelihood look the same since *Fighting Back* sites (and their comparisons) have a very high proportion of the crime in their area. Indeed, the crime rates in the *Fighting Back* areas and their comparisons are very high compared to the United States. For instance, though the homicide rate in the U.S. is roughly 10 per 100,000 in the *Fighting Back* sites it is more than 70 per 100,000.

Assessing whether the patterns of change in crime rates in *Fighting Back* and comparison sites are significantly different requires the use of the hierarchical or mixed models as outlined above. Some first examples of such models are presented below.

Figure 3. Total Crime Rates 1985-1995

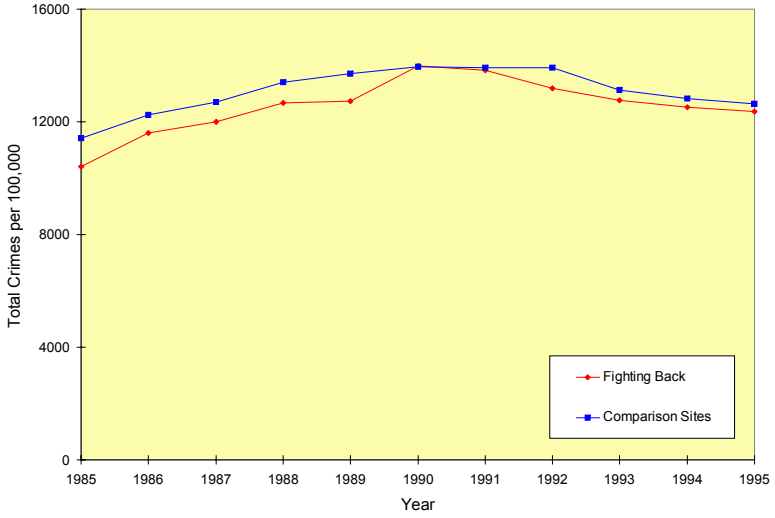


Figure 4. Rape Rates 1985-1995

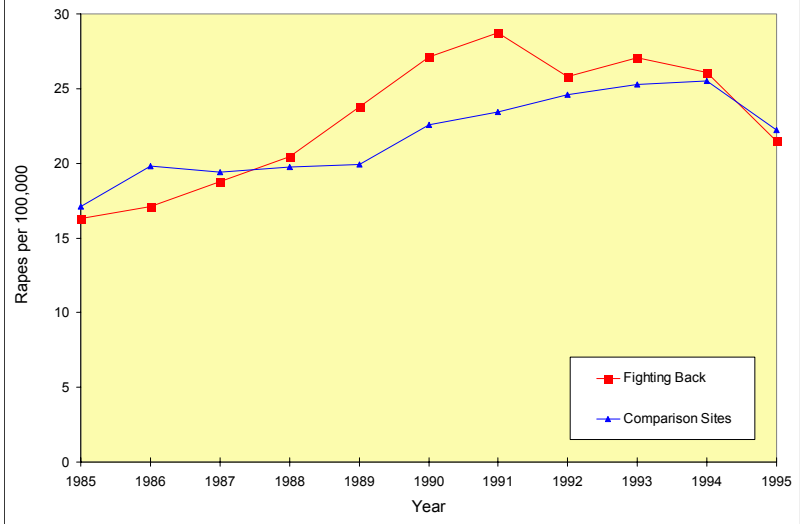


Figure 5. Homicide Rates 1985-1995

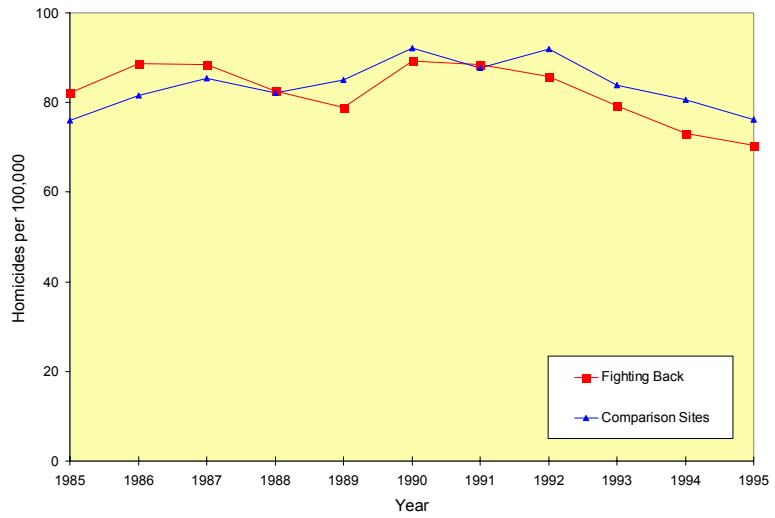


Figure 6. Robbery Rates 1985-1995

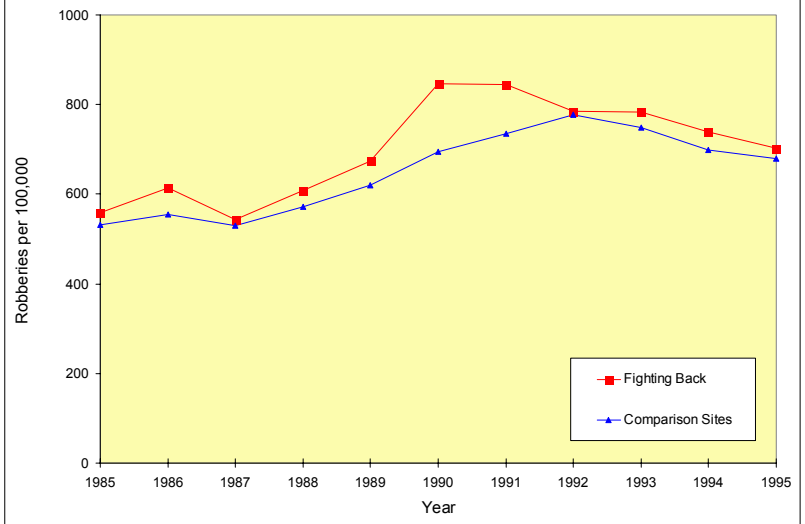


Figure 7. Assault Rates 1985-1995

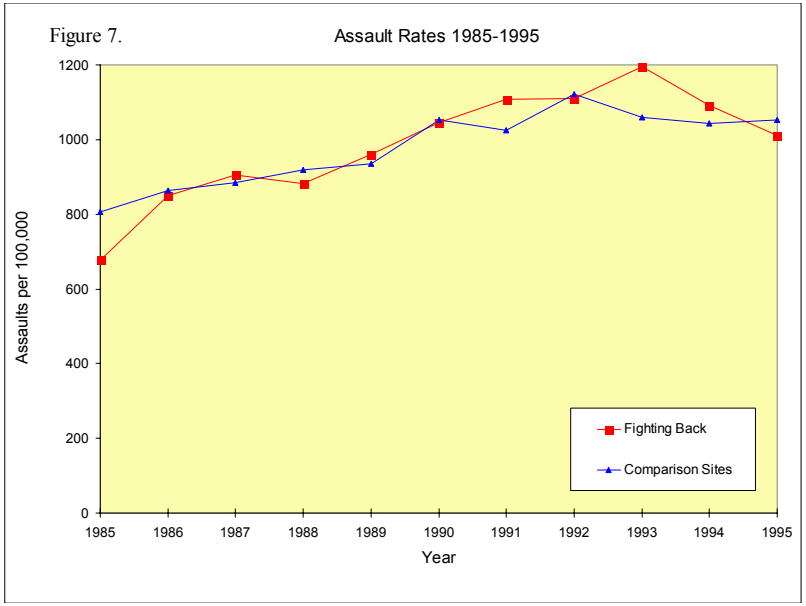


Figure 8. Larceny Rates 1985-1995

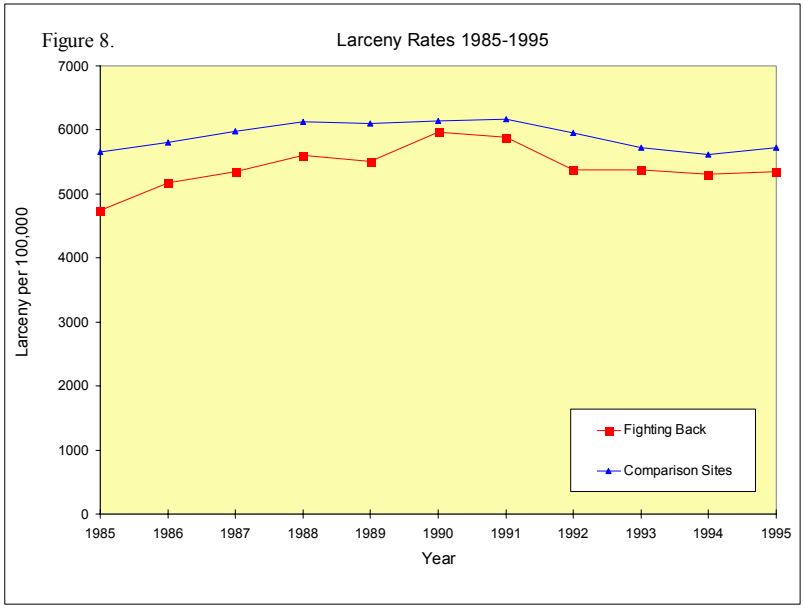


Figure 9. Vehicle Theft Rates 1985-1995

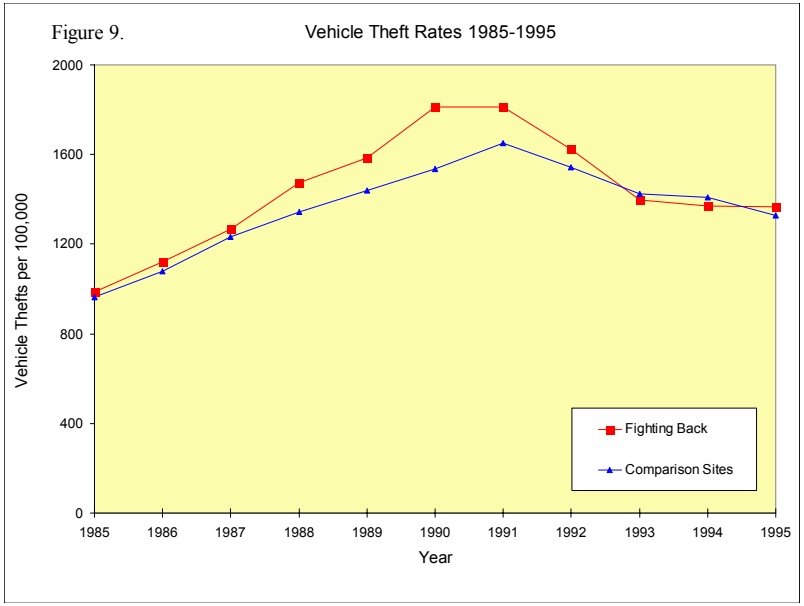
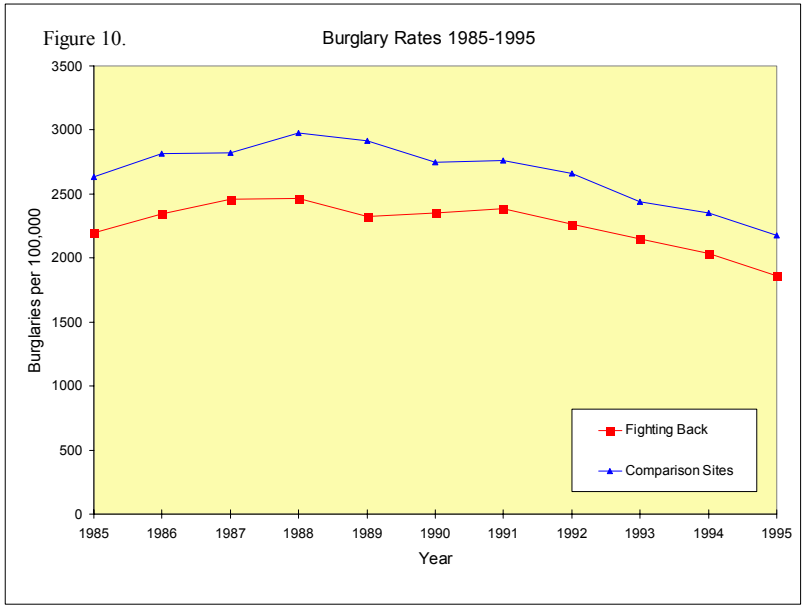


Figure 10. Burglary Rates 1985-1995



Analyses of Crime Data over Time

A multi-level analysis approach (HLM) was employed to determine if crime in *Fighting Back* sites appreciably changed after program implementation. Data from 12 *Fighting Back* and 29 comparison communities were examined (see Table 2, p. 6). The findings reported below represent HLM analyses of the *aggregated* UCR data for each community. That is, these data are presented for an entire city (e.g., Kansas City, Missouri) rather than the *Fighting Back* site within that municipality (e.g. Downtown Kansas City).[6]

Reported crimes were examined for the period 1980-1995 in each *Fighting Back* and comparison city. Four types of crime were analyzed: burglary, robbery, homicide, and assault. Reported crimes were aggregated within each year and divided by the 1980 census population estimate for each city, yielding a rate for each year. These rates were multiplied by 100,000 for ease of interpretation and represent the outcome variables for the analyses. As noted earlier, a three-level model was employed to model changes in the crime rates over 16 time points (1980-1995) for each city at Level 1, cities at Level 2, and "states" at Level 3. Coefficients in the model included the following: a variable for time (i.e. year) which represents linear trends in crime between 1980 and 1995; a dummy variable distinguishing the pre-*Fighting Back* period (1980-1992) from the implementation period (1993-1995), which accounts for any differences in overall crime rates between these periods; and a variable indicating *Fighting Back* or comparison sites. A final variable, the interaction between *Fighting Back* sites and the *Fighting Back* implementation period, is of great interest as it represents change in crime in *Fighting Back* sites after implementation when controlling for the other variables mentioned above. A significant *FB* x Period interaction indicates that crime rates diverged from comparison rates after implementation of *FB* in the community. These variables were entered into a three-level multiple regression.

Overall crime rates for all comparison sites in 1992 (the contrast category in the regressions) are presented in Table 3. These represent the estimated constant in each regression equation. Assault and robbery were the most frequently reported crimes with homicide occurring relatively infrequently.

[6] Analyses of *disaggregated* or neighborhood-specific data are currently underway. However, analyses of the distribution of crime rates within a city suggest that a substantial proportion of such activity takes place within the *Fighting Back* site and that analyses of the *aggregated* UCR rates are probably a good approximation of the disaggregated analyses in terms of time trends. Furthermore, adding neighborhood specific data will require developing models that take into account specific neighborhood areas.

Table 3 - Overall Crime Rates	
UCR Crime	1992 Rate per 100,000 in Comparison Sites
Burglary	2520.0
Robbery	638.5
Homicides	21.0
Assaults	3147.0

Estimates of time-related change in comparison sites are shown in Table 4. These estimates control for variations between communities in a state and across states. No significant linear trend over time was found for burglary, robbery, or homicide. The rate of reported assaults, however, did significantly increase between 1980 and 1995 in comparison sites at a rate of roughly 139 assaults per 100,000 per year. Controlling for linear trends over time, there appear to be no significant differences in rates between the periods before and after the *Fighting Back* implementation.

Table 4 - Change in Rate Over Time in Comparison Sites

	Change in Crime Rate (1980-1995)			Difference between pre-*FB* (1980-1992) and *FB* periods (1993-1995)		
	Coefficient	SE	t-value	Coefficient	SE	t-value
Burglary	-37.72	26.97	-1.4	-193.20	169.10	-1.14
Robbery	13.90	10.66	1.3	25.72	107.40	0.24
Homicide	0.38	0.33	1.1	1.38	3.49	0.39
Assault	139.30	29.80	4.7*	-30.59	318.30	0.10

* $p < .05$

There appears to be little change in crime rates for comparison sites between 1980-1995, with the exception of assaults. Furthermore, there are no significant differences in comparison sites between the period before and after program implementation. Do *Fighting Back* sites significantly diverge from the trends found for comparison sites? Table 5 shows the differences, on average, in crime rates between *Fighting Back* and comparison sites for the periods before and during program implementation. For the period before implementation (1980-1992), there are significant differences between treatment and comparison communities. Burglary rates overall, controlling for year, are lower in *Fighting Back* communities by roughly 427 per 100,000 people. Likewise, the average assault rate is lower in *Fighting Back* sites by roughly 328 per 100,000. Robberies, on the other hand, appear to be more frequent in *Fighting Back* sites, although this difference only approaches significance.

Table 5 - Differences Between *Fighting Back* and Comparison Sites

	Pre-*FB* Implementation (1980-1992)			During *FB* Implementation (1993-1995)		
	Coefficient	SE	t-value	Coefficient	SE	t-value
Burglary	-427.30	140.70	-3.0*	235.10	240.10	1.0
Robbery	58.21	33.12	1.76	7.86	72.78	0.1
Homicide	0.43	1.37	0.3	1.62	3.20	0.5
Assault	-328.30	147.00	-2.2*	-4.22	349.50	-0.0

* $p < .05$

At issue for evaluation of the *Fighting Back* program is not whether there are differences in crime rates between *Fighting Back* and comparison sites *before* implementation, but whether the differences between the two change after implementation has begun. The right side of Table 5 displays differences after program implementation, controlling for differences between *Fighting Back* and comparison sites prior to 1993. There appears to be no significant difference in crime rates for the *Fighting Back* period after taking into account prior differences between treatment and comparison sites.

These findings suggest that crime rates for *Fighting Back* sites have not changed during the three years of implementation analyzed above. Given the nature of the *Fighting Back* intervention, however, one would not expect large effects. Although program implementation began in 1992, the program theory suggests that the effects of implementation are going to be realized much later. Unlike a policy change with a clearly defined date of implementation (e.g., uniform 21 year old drinking age), the *Fighting Back* implementation date represents the point at which the intervention was to begin development within the community. Even though the process began in 1992, it took several years to get coalitions established and to have the potential to change the harms caused by substance abuse. Thus, sufficient test of the *Fighting Back* effect will require additional years of data so that a true "post-implementation" trend line can be estimated. In addition, more work needs to be done to perform analyses that take into account the *Fighting Back* and comparison sites in terms of the political jurisdictions. Arrests and juvenile arrests will also be analyzed, as will the other three types of Index crimes. Models focusing directly on precinct or ward reporting areas rather than simply political districts will be tested.

Using all of these data and models it will be possible to definitively answer these questions:

- Are the crime trends in *Fighting Back* and comparison sites the same or different?
- If they diverge, in what ways and where?

Once these basic questions are answered, then relating any changes to programs or specific initiatives including those initiated by the *Fighting Back* program or other sources, as well as to survey data and trends in other indicators will be especially important.

Substance Abuse-Related Deaths

Alcohol and other drug related deaths are a commonly cited national measure of health problems or harm (Horgan, Marsden, & Larson, 1993; NIAAA, 1992; Stinson & DeBakey, 1992; Stinson, Dufour, Steffens & DeBakey, 1993). In their recent review of causes of death in the United States, McGinnis and Foege (1993) identified alcohol and other drugs (AOD) as two of the nine most prominent contributing causes of death, with other leading contributing causes (e.g., tobacco use, sexual behavior, and motor vehicle accidents) strongly associated with alcohol and drug use. Thus, if *Fighting Back* reduces health-related harms, rates of substance abuse related deaths should be lower in those communities that participated in the *Fighting Back* program than those communities that did not when compared to rates prior to program implementation.

Many substance abuse deaths result from diseases associated with chronic heavy drinking or drug use (an "indirect" relationship). Although one might not expect the rates of such deaths to decrease in response to short term interventions, significant effects over time might be observed for interventions that attempt to make systemic changes. For example, even though cirrhosis of the liver develops over 20 years, mortality from cirrhosis decreased significantly during Prohibition (Cook, 1981; Pequignot & Tuyns, 1984). Other deaths indirectly related to substance abuse (e.g, injury, overdose or suicide) have also been shown to decrease in the short term in response to intervention strategies. For example, Sloan, Reilly, and Schenzler (1994) demonstrated that increases in the price of alcohol significantly reduced the rates of mortality from traffic accidents and suicide. Similarly, Hingson et al. (1996) demonstrated that cities that participated in a community intervention designed to reduce alcohol related driving problems evidenced significantly lower rates of fatal traffic accidents and injuries than did cities that did not participate in the program. Findings such as these suggest that, although not the sole measure of the success of a program, mortality rates might, in fact, be expected to change as a function of particular community-level interventions.

For young people ages 15-24, the leading causes of death are unintentional injuries, homicides, and suicides (Sells & Blum, 1996). Of the unintentional injury deaths, more than three quarters are due to motor vehicle accidents (National Safety Council, 1993). Of these motor vehicle deaths, males accounted for three quarters. Driving accidents for young males are strongly associated with alcohol (National Highway Traffic Safety Administration, 1993). To the extent that individual *Fighting Back* initiatives targeted young males, it would be expected that injury deaths for this group would decline.

In order to investigate whether community initiatives in the *Fighting Back* sites have been effective in altering the course of substance-abuse related mortality, death rates for the *Fighting Back* communities and their comparison sites were examined. This was done by examining both direct and indirect causes of death for years prior to the implementation of the program to the last available year of mortality data (1995). Long term consequences of the *Fighting Back* program will continue to be evaluated as additional years of mortality data

become available. Details of the methods employed and results are described below.

Method

Sample

Mortality data have been obtained for seven of the 14 *Fighting Back* communities along with 18 comparison sites associated with these seven. Data were disaggregated to the site level using the zip code categorizations defined in prior phases of the evaluation (Saxe et al., 1995b), except for sites in Connecticut and Massachusetts. Sites in these two states were disaggregated to the city level because there was a high correspondence between city and zip code boundaries. The sites included in the analysis and the years of available data are summarized in Table 6.[7]

Table 6 - Sites Included in the Analyses

Site	Years	Note
California Vallejo + Comparisons Santa Barbara + Comparisons	1989-1994	Zip codes not recorded prior to 1989; therefore, years prior to 1989 are not included in mortality rates. Multiple-cause data currently not available at the zip code level. Therefore, California data are included only in estimates based on the underlying cause[8] of death. A version of the multiple cause data that can be merged with the zipcode-level underlying cause data has been ordered and analyses will be updated.
Connecticut New Haven + Comparisons	1986-1993	City-level.
Massachusetts Worcester + Comparisons	1985-1993	City-level. 1994 & 1995 data have just arrived and analyses will be updated.
North Carolina Charlotte + Comparisons	1988-1995	Zip codes not recorded prior to 1988; therefore data prior to 1988 are not included in the estimates of mortality.
South Carolina Columbia + Comparisons	1989-1994	Zip codes not recorded prior to 1989; therefore data prior to 1988 are not included in the estimates of mortality.
Wisconsin Milwaukee + Comparisons	1989-1995	Zip codes not recorded prior to 1989; therefore data prior to 1988 are not included in the estimates of mortality.

Data Sources

[7] Data from Texas have just been acquired. Data from Missouri, New Jersey, and Arkansas have been ordered. Data from Maryland are awaiting institutional review board approval, Washington, DC data have been requested from the health commissioner. It is expected that by the end of July all states will be available for analysis.

[8] Underlying cause is the event that initiated the train of events that resulted in death.

The mortality data used in these analyses are based on death certificate records issued by the State Health or Vital Statistics agencies. Death certificates list the underlying cause of death as well as all other mentioned or contributing conditions. The States use uniform computer software (MICAR) to encode the death certification information using the standard recommended by the World Health Organization (i.e., its International Statistical Classification of Diseases [ICD9])[9]. All of the data in the present report were obtained directly from the State Health Statistics units. The advantages of obtaining the data directly from the states rather than NCHS are (1) data is available from states often one or two years before it is available from NCHS, and (2) except for a few cases (e.g., Connecticut), states record zip code or census tract information which enables site level disaggregation, whereas the public access national files can be disaggregated only to the state or county levels.

Classification of Alcohol and Other Drug Related Deaths

A review of methods for classifying deaths as drug or alcohol related was conducted to establish a standard set of ICD9 codes. Two commonly referenced categorizations, along with the algorithm employed by the evaluators, are summarized in Table 7. One set is used by NCHS in summaries of vital statistics in which alcohol and drug deaths in the US are reported (e.g., *MVSR*, Kochanek & Hudson, 1995). The ICD9 categories that are included in the NCHS method are identified with a check in the third column of the table. This set is restricted to only those cases in which there is explicit mention of a drug or alcohol cause (e.g., drug psychoses, alcohol psychoses) and are referred to as alcohol and drug direct deaths in the analyses.

One limitation of examining death certificate records to identify cases of substance abuse mortality is underreporting. Physicians or coroners indicate on a death certificate all conditions noted that may be associated with the death. Because of the stigma associated with alcohol-related causes, it is safe to presume that physicians have underreported alcohol-related disease as the cause of death, choosing to mention "cirrhosis" but not "alcoholic cirrhosis", for example. Research on alcohol-related deaths has examined the involvement of alcohol in disease and injury deaths where alcohol is identified as a contributing (indirect) cause (Fox, Merrill, Chang & Califano, 1995; Ravenholt, 1984; Rice, Kelman, Miller & Dunmeyer, 1990; Serdula, et al., 1995; Shultz et al., 1991; Stinson, et al., 1993). Including these diseases and injuries which are associated with alcohol and drug use is one manner of compensating for underreporting.

To identify associated diseases and injuries, we relied on the methodology used by the Centers for Disease Control (CDC). As published in the Alcohol-Related Disease Impact (ARDI) software (Shultz et al., 1991), the CDC reports alcohol-attributable fractions (AAFs), or estimates of the number of deaths that can be attributed to alcohol involvement for each type of death. These estimates are displayed in the fourth column of Table 7. Estimates are based on alcohol involvement; no estimates to date have been made of drug-related deaths. Direct alcohol related deaths (those in which there is explicit mention of alcohol) have AAF ratios equal to 1.00. Other diseases (e.g., respiratory tuberculosis) and injuries (e.g., motor vehicle) vary in the

[9] In some states, death certificates are forwarded to the National Center for Health Statistics (NCHS) who encode the death certificates using the same MICAR program. In the current sample, death certificates were encoded by all of the states rather than NCHS.

estimated frequency of alcohol involvement with estimates ranging from 0.05 (pneumonia and

Table 7 - Summary of ICD-9 codes used in Coding of Cause of Death

Disease Category	ICD-9	CDC	AAF	Included in *Fighting Back* Algorithm
Explicit Drug (drug direct)				
Drug Psychoses	2920-2929	√		√
Drug Dependence	3040-3049	√		√
Drug Abuse	3052-3059	√		√
Polyneuropathy due to Drugs	3576			√
Suspected damage to fetus from drugs	6555			√
Noxious Influences Affecting Fetus (note: 760.71 = alcohol, >=drugs)	7607			√
Drug Withdrawal Syndrome in Newborn	7795			√
Accidental Poisonings by Drugs	E8500-8589	√		√
Suicide & Self-Inflicted Drug Poisoning	E9500-9505	√		√
Assault from Poisoning by drugs & medicatments	E9620	√		√
Poisoning by drug, accident undetermined	E9800-9809	E9800-E9805		√
Poisoning by steroids	9620			√
Poisoning by Opiates	9650-9659			√
Poisoning by Oxazolidine Derivatives	9660			√
Poisoning by Barbiturates	9670-9679			√
Poisoning by CNS depressants	9680-9689			√
Poisoning by Antidepressants	9690-9699			√
Poisoning by Dietetics	9770			√
Explicit Alcohol (alcohol direct)				√
Alcoholic Psychoses	2910-2919	√	1.00	√
Alcohol Dependence	3030-3039	√	1.00	√
Alcohol Abuse	3050	√	1.00	√
Alcoholic Polyneuropathy	3575	√	1.00	√
Alcoholic Cardiomyopathy	4255	√	1.00	√
Alcoholic Gastritis	5353	√	1.00	√
Alcohol Related Chronic Liver Diseases	5710-5713	√	1.00	√
Excessive Blood Level of Alcohol	7903	√	1.00	√
Accidental Poisoning by Alcohol	E8600-8609	√ (E8600,E8601)	1.00	√
Poisoning by Alcohol Deterrents	9773			√
Toxic Effect of Alcohol	9800			√
Diseases Indirectly Affected by Alcohol & Drugs				
Respiratory Tuberculosis	0110-0129		.25	
Cancer of the Oral Cavity	1400-1499		.50M .40F	√
Cancer of the Esophagus	1500-1509		.75	√
Cancer of the Stomach	1510-1519		.20	
Cancer of the Liver	1550-1552		.15	
Cancer of the Larynx	1610-1619		.50M .40F	√
Diabetes Mellitus	2500-2509		.05	
Essential Hypertension	4010-4019		.076	
Cerebrovascular Disease	4300-4380		.065	
Pneumonia & Influenza	4800-4879		.05	
Disease of Esophagus & Stomach	5300-5379		.10	
Chronic Hepatitis	5714			√
Other Cirrhosis	5715-5716		.50	√
Acute Pancreatitis	5770		.42	√
Chronic Pancreatitis	5771		.60	√
Pellagra	2652			
Portal Hypertension	5723			
Hepatitis Unspecified	5733			

Table Continues

Table 7 - Summary of ICD-9 codes used in Coding of Cause of Death (cont.)

Disease Category	ICD-9	CDC	AAF	Included in *Fighting Back* Algorithm
Injuries Indirectly Affected by Alcohol & Drugs				
Motor Vehicle	E8100-8250		.42	√
Other Vehicle Accidents	E8260-8269, E8290-8299		.20	
Watercraft Injuries	E8300-8389		.20	
Air & Space Transport Accidents	E8400-8459		.16	
Accidental Falls	E8800-8889		.35	
Injuries caused by Fires	E8900-8999		.45	√
Drowning	E9100-9109		.38	
Suicide & Self-Inflicted Poisoning	E9506-9590		.28	
Homicide & Injury Purposely Inflicted by Other	E9600-9690		.46	√
Other Accidents (Alcohol Related)	E916-928		.25	

influenza) to 0.75 (cancer of the esophagus). It should be noted that these causes vary not just in their association to alcohol, but also in their association to tobacco and other drugs (Fox et al., 1995). Fox et al. (1995) provided estimates of attributable risks across all alcohol, tobacco, and other drug causes. Because much of the risk for the diseases examined by Fox et al. could be attributed to tobacco rather than explicitly due to alcohol or drugs, and the focus of *Fighting Back* was not on tobacco, estimates based on ARDI rather than Fox were used. Although there is some variation in the actual AAF values reported across studies, in their ARDI software the CDC recommend a set of values based on the work of Rice, et al. (1990). The CDC suggests that new AAF ratios can be added as the research in this area develops. To date, however, little evidence has been provided for revising these estimates. In the present investigation, only those disease and injury categories that were strongly associated with alcohol use, and possibly drug use, were included in the *Fighting Back* algorithm. "Strongly associated" was defined as those causes with AAFs greater than or equal to 0.40. These ICD9 categories are indicated with a check mark in the last column of Table 7. Thus, four overall clusters of ICD9 categories were examined: drug direct deaths, alcohol direct deaths, diseases indirectly associated with substance use, and injuries indirectly associated with substance use.

Another manner of compensating for the strong likelihood of under-reporting was to examine both the contributing or mentioned conditions as well as the underlying cause. Many investigations of mortality base estimates exclusively on whether the underlying cause is drug or alcohol related. Death certificate information, however, records the underlying cause along with up to 20 possible contributing causes. In the present analysis, AOD death rates were estimated using both the underlying cause method and a multiple cause method. As with the crime data, it is not expected that trend lines based only on three years of program implementation will yield significant changes in mortality rates. These data, however, should provide evidence of any pre-existing differences between *Fighting Back* and their comparison sites, as well as establish a baseline with which to compare changes in rates across time.

A summary of the death rates employing these methods is provided below. These data should be interpreted with caution. Whether or not the observed differences are statistically significant, or whether program effects are observed when site-level characteristics are

controlled for (such as demographic make-up), have yet to be tested. An HLM analysis will be conducted to test the *Fighting Back* effect. The substance abuse death data will be modeled in a manner similar to that conducted in other areas of the evaluation (cf. Kadushin, Reber, Livert & Saxe, 1997). Mortality data, however, is structured in a four level hierarchy with individuals (level 1) nested within time periods (level 2), time nested within sites (level 3), and sites nested within site groups (level 4). The primary prediction is one of an interaction between time and the presence of *Fighting Back*.

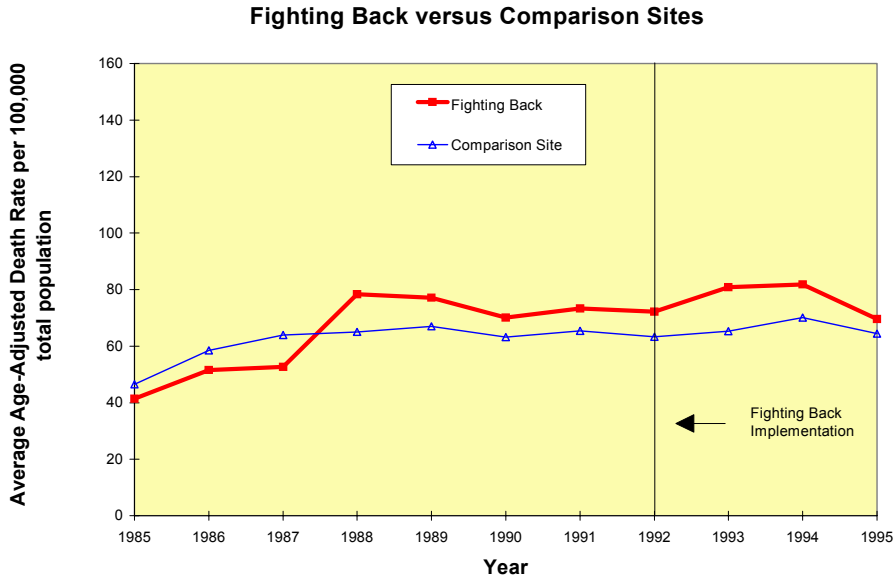
Examination of Underlying Cause of Death

In the present sample, underlying cause of death was available from all six states involved: California, Connecticut, Massachusetts, North Carolina, South Carolina, and Wisconsin. The number of AOD deaths, cause-specific death ratios, cause-specific death rates, and age-adjusted death rates[10] for each of the *Fighting Back* and comparison sites across time are displayed in Appendix C.

The average age-adjusted rate across all time periods was 66 deaths per 100,000 due to AOD related causes (68 per 100,000 in *Fighting Back* communities and 63 per 100,000 in comparison communities). Figure 11 displays the average age-adjusted rates based on underlying cause across the *Fighting Back* and comparison sites for the years 1985-1995. Since 1988, *Fighting Back* communities have been consistently higher in the average rate of AOD deaths than the comparison communities. Prior to the implementation period (1992) the average age-adjusted rate across all *Fighting Back* communities was 64 deaths per 100,000 population. After 1992, the average rate increased 19% to 76 deaths per 100,000. There is a decrease from 1994 to 1995, but additional years of data will need to be examined to determine whether this is a reliable downward slope after program implementation. In comparison communities the average age-adjusted rate was 61 deaths per 100,000 prior to 1992 and 65 deaths between 1992 and 1995, an increase of only 6%. In terms of average rates across *Fighting Back* and comparison sites, substance abuse mortality based on underlying cause have not declined[11].

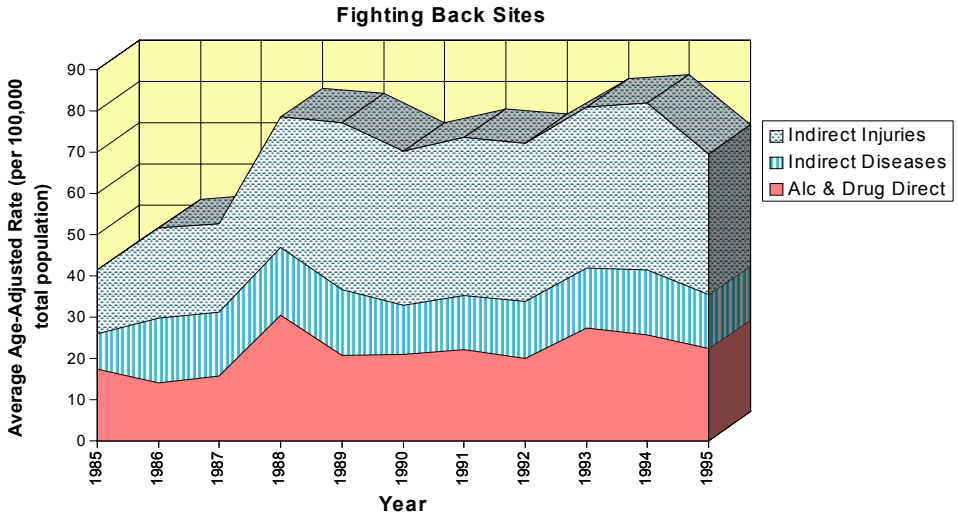
[10] See Appendix C for definitions of each rate and methods of computation.
[11] Average age-adjusted rates for each site and its respective comparison sites are included in Appendix D.

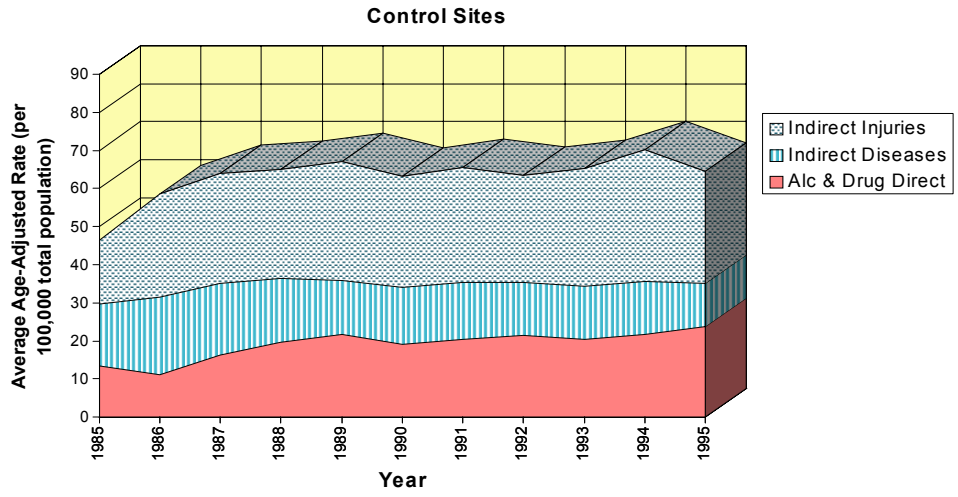
Figure 11. Average age-adjusted rates based on all alcohol and drug related causes using underlying cause of death.



A breakdown of average age-adjusted rates by cause (direct alcohol or drug causes versus indirect causes) across all years (1985-1995) is displayed in Figure 12. As can be seen, of all of the AOD-related deaths, more deaths were due to indirect substance use related injuries than to explicit alcohol or drug-related causes or indirect alcohol related diseases in both the *Fighting Back* and comparison sites. There appears, however, to be a higher rate of AOD-related injury deaths in *Fighting Back* sites than in comparison sites: the average rate of AOD-related injury deaths in the *Fighting Back* communities was 33 per 100,000 population and in the comparison communities 29 per 100,000 population. In addition, one can also see that the decrease from 1994-1995 in *Fighting Back* sites occurs across all AOD-related causes.

Figure 12. Underlying cause of death by type of cause in Fighting Back and Comparison sites.





Examination of Multiple Cause of Death

The average rates based on underlying cause suggest that alcohol and drug-related deaths are relatively infrequent, less than 100 per 100,000. Before testing whether the observed overall patterns correspond to statistically significant differences between *Fighting Back* and comparison sites and significant trends across time, mortality rates based on the multiple cause of death data were examined. As previously described, these rates are based on any mention of alcohol or drug-related causes across the underlying cause and mention conditions. The number of substance abuse deaths, cause-specific death ratios, cause-specific death rates, and age-adjusted death rates for each of the *Fighting Back* and comparison sites across time using multiple cause are included in Appendix C. The average age-adjusted AOD mortality rate using

the multiple cause of death algorithm was 84 deaths (per 100,000 population), 92 in *Fighting Back* communities and 21% fewer, 76, in comparison communities.

Age-adjusted rates for all *Fighting Back* versus comparison communities across time are displayed in Figure 13. Although higher overall compared to the rates based on underlying cause, rates based on the multiple cause of death display a very similar pattern across time as rates based on the underlying cause (cf. Figure 11, p 29). Alcohol and drug-related death rates were higher in *Fighting Back* communities prior to the implementation period and do not appear to have decreased significantly during the first three years of implementation[12], although again there is a decline in 1995 that might indicate a change in slope. Additional years of data, however, must be examined before one could draw such a conclusion.

Figure 13. Average age-adjusted rates based on al alcohol and drug-related causes using multiple cause of death.

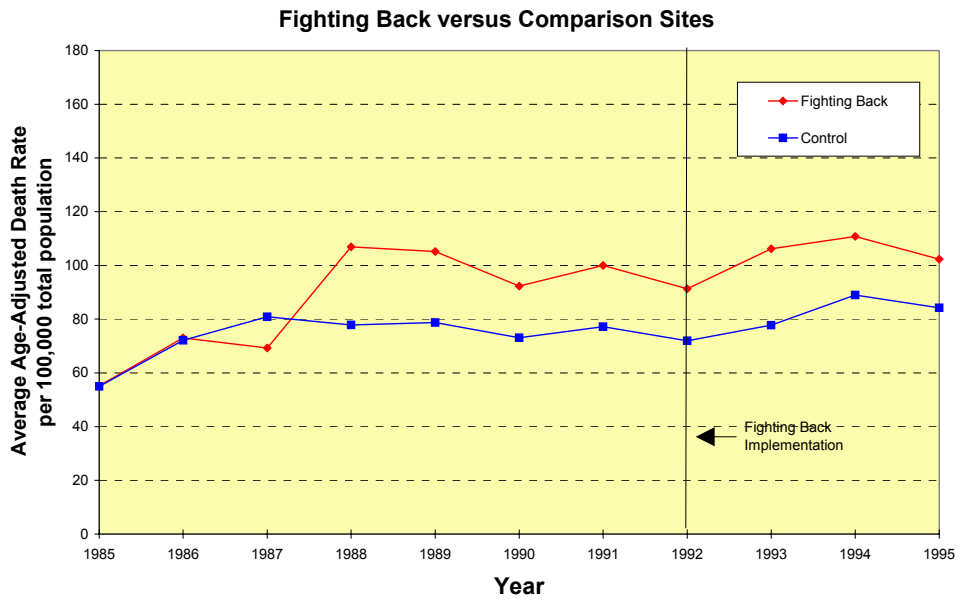
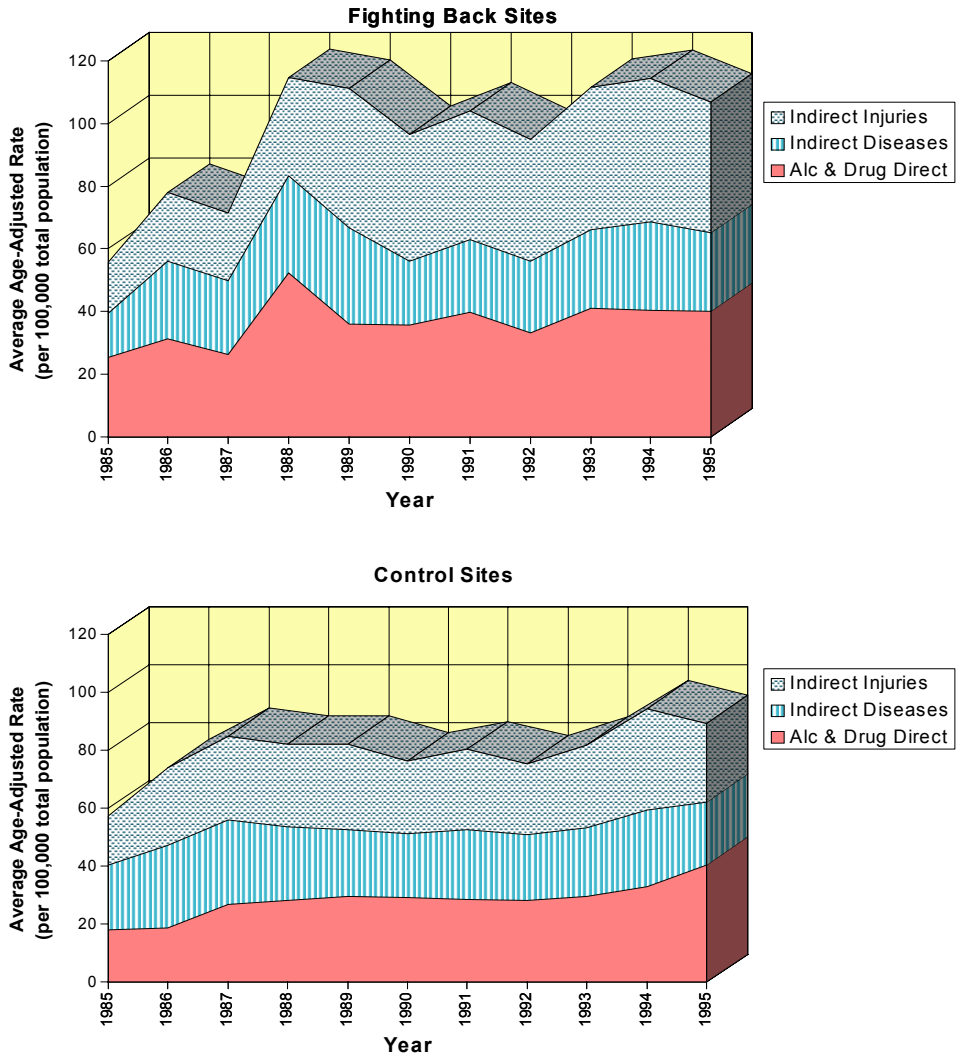


Figure 14 displays the average age-adjusted rates for each type of cause (direct alcohol and drug, indirect diseases and injuries). When compared to the underlying cause displayed in Figure 12 (see p. 30), it can be seen that many more AOD deaths due to direct alcohol and drug causes and diseases associated with alcohol are identified when multiple cause is considered. In addition, both alcohol and drug direct causes and indirect injury deaths are higher in the *Fighting Back* communities than in the comparison communities. This is true across time and does not appear to change significantly after program implementation in 1992.

[12] Age-adjusted rates based on multiple cause for each of the *Fighting Back* sites and its comparisons across time are displayed in Appendix D.

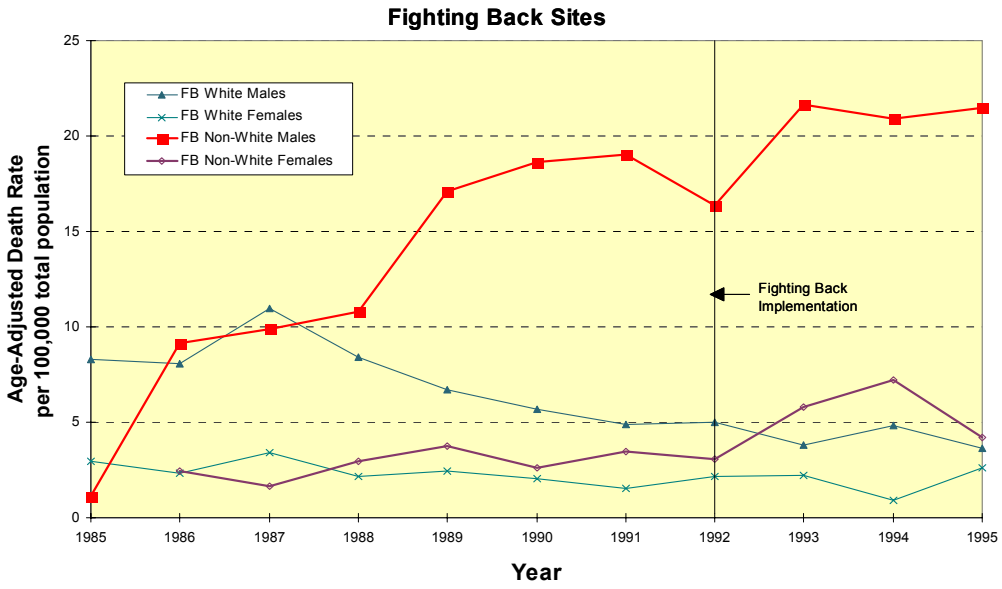
Figure 14. Average age-adjusted rates by type of cause using multiple cause of death data in *Fighting Back* and Comparison sites.



Because many of the *Fighting Back* communities target younger populations and unintentional injuries are a leading cause of death among younger individuals (Sells et al., 1996), injury related deaths for 15 to 44 year olds were selected out of the overall rates and examined in greater detail. Average age-adjusted rates by race and sex across all *Fighting Back* and comparison communities are displayed in Figure 15. In *Fighting Back* communities, rates of substance abuse related injury deaths are substantially higher for non-white males than for white males and do not appear to have decreased for this group after the implementation of *Fighting Back*.[13]

[13] Examination of site by site rates in Appendix D might suggest that the high rate observed for non-white males could be heavily weighted by a small number of sites. Whether these high rates could be due to recording errors in the collection of death certificate information in these sites is currently under investigation (e.g., under-reporting of zip codes for non-white population would skew rates that are standardized to the total population of non-whites within those zip code boundaries.)

Figure 15. Average age-adjusted rates of deaths due to alcohol related injuries in Fighting Back and Comparison sites for white and non-white males and females ages 15-44.



Discussion

Whether a community initiative such as *Fighting Back* can alter the pattern and course of substance-abuse related deaths is an empirical question. It was expected that fewer people should be dying of alcohol and drug related causes as a result of the systemic change generated by the *Fighting Back* Initiative. With the data examined to date, there is insufficient evidence to conclude with confidence that rates of substance abuse deaths were altered during the first three years of implementation. The nature of the *Fighting Back* construct, however, necessitates that additional years of data, and additional sites, must be examined before strong conclusions can be drawn.

Fatal Traffic Crashes

A fatal traffic crash involving a driver under the influence of alcohol or other drugs often "brings home" to many individuals and communities one of the palpable harms of substance use and abuse. Alcohol use is directly linked to many traffic deaths. Over 17,000 people die annually and about 289,000 persons are injured in crashes in which police report alcohol involvement (NCSA, undated). Table 8 shows the relative percentages of different kinds of crashes which have been determined to be alcohol-related. The rate of alcohol involvement in fatal crashes is almost 3 times as high at night (64% of crashes) as during the day (23% of crashes; NCSA, undated). Of all alcohol-involved drivers killed in traffic crashes, published data indicate that the largest single category are drivers in single-vehicle nighttime crashes (57% of all alcohol-involved driver fatalities). A high proportion of reckless driving at night is also associated with other drug use (e.g., cocaine or marijuana; see Brookoff et al., 1994).

Table 8 - Number of Fatal Crashes that were Alcohol Involved

From 1993 FARS Data

Type of Crash	Total Number	Percent of Total that were Alcohol Involved	Of Alcohol Involved Percent of Each Type
Single Vehicle	11,152	49%	72%
Daytime	4,062	23%	12%
Nighttime	6,789	64%	58%
Multiple Vehicles	11,980	18%	28%
Daytime	7,295	7%	7%
Nighttime	4,670	35%	22%
Total	23,132	33%	100%

Source: Authors' calculations from FARS 1993. Data repeated in NHTSA, 1995.

Both fatal and nonfatal single vehicle nighttime crashes (SVNC) have been used as measures of alcohol-involvement in previous evaluations of alcohol policy initiatives (Holder & Wagenaar, 1994). The high association between SVNC, particularly those resulting in death, with alcohol-involvement indicates that SVNC is an objective, standardized measure useful for cross-site and longitudinal evaluation of alcohol behavior among drivers.

Trends in U.S. Rates

Motor vehicle crashes constitute the leading cause of death for persons every age from 5 to 32 years old (NHTSA, undated). U.S. traffic fatality rates have, however, reached historic lows in recent years, with the reduction in alcohol involvement viewed as a significant contributor to the decline. Reduced fatalities have occurred in 49 states and the District of Columbia (Fell & Klein, 1994). Alcohol was estimated to be involved in 44% of fatal crashes in 1993, which is substantially reduced involvement as compared to 1983 (56% of all fatal crashes). The youngest and oldest drivers experienced the largest decreases in intoxication rates (NCSA, undated). The raising of the minimum drinking age has been linked to reduced fatalities among drivers 18 to 20 years old.

Alcohol involvement in fatal crashes is associated with several characteristics of drivers. Young adult drivers aged 21 to 24 years old experience the highest intoxication rates in fatal crashes (30.7% in 1993). Furthermore, motorcycle operators in fatal crashes (32.9% intoxicated) have higher rates than other drivers (i.e., passenger car drivers, 20.7%; NCSA, undated). Intoxicated drivers in fatal crashes are much more likely to have a prior DUI conviction (13% vs. 2%) and to have a record of license suspensions or revocations (25% vs. 8%) (NCSA, undated).

Source of Data

Data for the present analyses are taken from the Fatal Accident Reporting System (FARS) operated by the National Highway Traffic Safety Administration. FARS collects detailed information on every traffic crash occurring in the United States in which at least one person dies within 30 days of the crash. Working cooperatively with each state, detailed data on the conditions of the crash, the vehicles involved, the driver(s) and other person(s) involved are collected and recorded for each fatal crash using a common format and coding scheme. FARS has been collecting data continuously since the late 1970s. All 50 states, the District of Columbia, and Puerto Rico report to the system. Data are released yearly in computer files, along with reports produced by the NHTSA. FARS thus provides an overall measure of highway safety, helps identify traffic problems, and provides an objective basis on which to evaluate the effectiveness of motor vehicle safety standards and highway safety programs. FARS data are used by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) to track trends in national alcohol-related crashes (Zobeck, Stinson, Grant, & Bertolucci, 1993). In the present report data from 1987 through 1995, the latest year available, are assessed.

The central difficulty in using FARS data is linking accidents to the *Fighting Back* and comparison community target areas. FARS data may be linked to the target communities in two different ways. The zip code of the driver is recorded, as is very detailed locational data on the traffic crash itself. For this analysis, driver's zip code was the principal focus. Thus, the measure is based upon the involvement of residents of *Fighting Back* and Comparison communities in fatal crashes. The FARS data also supply various geographic codes of the actual location of the accident. These codes will be acquired and made part of later analyses. Although the present report is based only on driver's residence, both location of accident and residence of driver are relevant approaches to using these data.

Definitions of Alcohol-Related Crashes

Alcohol involvement in crashes has been measured in various ways using FARS data. Preliminary findings are presented using two measures:

- *Rate of alcohol-involved fatal crashes*: defined as the number of fatal crashes occurring at night (between 6 pm and 5:59 am) and involving only a single vehicle, expressed as a population rate. The advantage of this measure is that it is comparable to other population based measures of harm (e.g., number of homicides per 100,000; number of hospital admissions per 100,000; number of injuries per 100,000), allowing one to draw conclusions about the relative harm of traffic crashes versus other events.
- *Percent of fatal crashes that are alcohol-involved*: defined as the number of fatal crashes occurring at night (between 6 pm and 6 am) and involving only a single vehicle, expressed as a proportion of all fatal crashes. This measure has particular advantages when doing cross-community comparisons. The total number of fatal crashes, both those that are alcohol-involved and those that are not alcohol-involved, varies dramatically across communities and over time. This variation relates to

community differences in road conditions, speed limits, miles driven, seat belt usage, car ownership, and other conditions. By expressing the number of alcohol-involved crashes as a percent of total crashes, these other conditions are controlled.

Alternative measures have been used by the NIAAA and the NHTSA which rely either solely or in part on coding three alcohol-related variables : judgment of the investigating officer; blood alcohol concentration [BAC] test; and citation for driving under the influence [DUI]. Because these variables are inconsistently coded over time and across communities, a judgment was made that the most reliable and objective measures of alcohol involvement are proxy measures based upon single vehicle nighttime crashes. In fact, NHTSA cautions that problems may occur in conducting state-level analyses because of the missing data problem associated with the BAC test variable. Among *Fighting Back* states, testing rates for fatal crash drivers vary tremendously, from a low of 0% (for the 20 fatalities in the D.C. area) to a high of 86% (NCSA, undated).[14] Other imputation-based measures that have been used by the NHSTA are under review for future work.

For the present analysis, fatal crash events were included in the study if any driver of any involved vehicle lived within the boundaries of the study zip codes. In conducting the present analysis, the first step was to characterize every crash in the U.S. as being in a *Fighting Back* site, in a comparison site, in a state that included a *Fighting Back* site, or elsewhere. Second, population data based on zip codes were accessed to compute the number of people 16 or older in each site in 1990. These data were used in computing the population-based rates. Eventually, county level census data may be used to adjust these population figures to reflect change. This procedure can also be used to adjust age, sex and race rates. For the present analyses, however, the rate was computed based upon the population in 1990, using the following formulas:

Rate SVNC (year) = (SVNC) / (1990 Population 16 or older) x 100,000

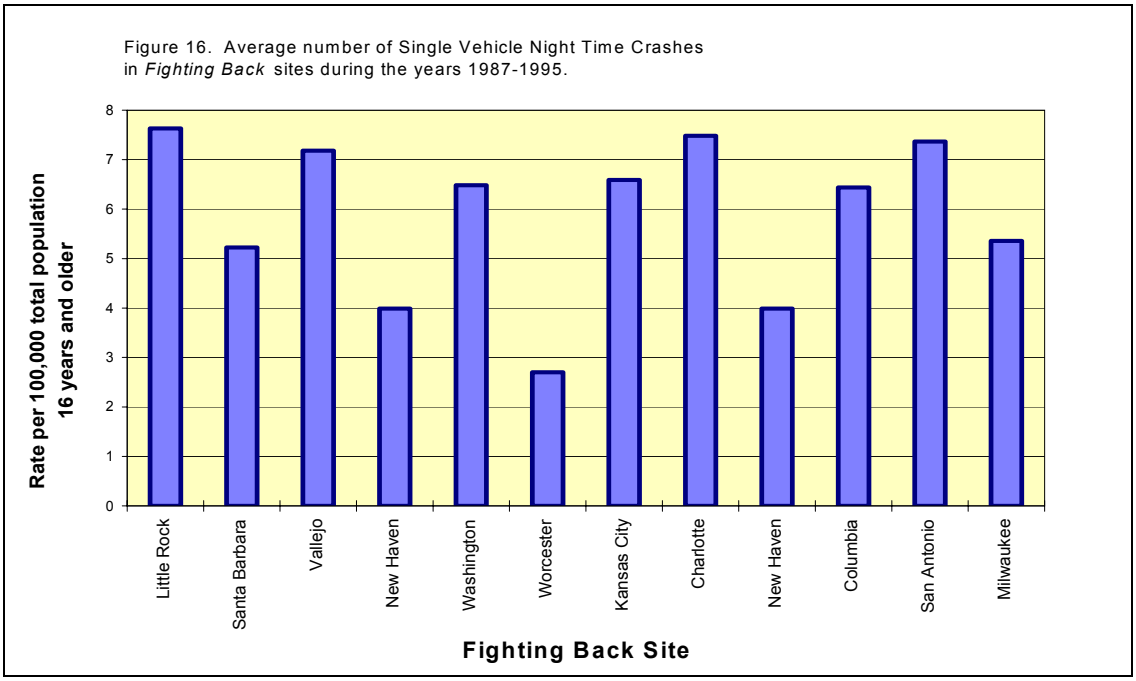
Percent SVNC(year) = (SVNC)/(All Crashes) x 100

Results

From 1987 through 1995, the 12 surveyed *Fighting Back* sites had a combined total of 706 fatal SVNCs. The number per year ranged from 62 in 1993 and 1995 to 99 in both 1990 and 1992. As a group the sites experienced approximately 6 SVNCs per 100,000 population. Figure 16 presents the combined data for all 12 sites, giving the average rate of AOD-involved crashes for the period 1987 through 1994. As is clear from this chart, both total crashes and the number of SVNC crashes vary from site to site. This is not surprising, given the diversity in the size and nature of the *Fighting Back* comparison sites. Worcester averages less than 3 such incidents per

[14] The evaluation team determined from published NCSA data that the percent of driver fatalities with known BAC test results in 1993 were: Arkansas, 53.7%; California 79.9%; Connecticut, 85.4%; District of Columbia, 0%; Massachusetts, 85.1%; New Jersey, 55.9%; North Carolina, 86.0%; South Carolina, 25.9%. Historical testing rates appear to be lower than in 1993.

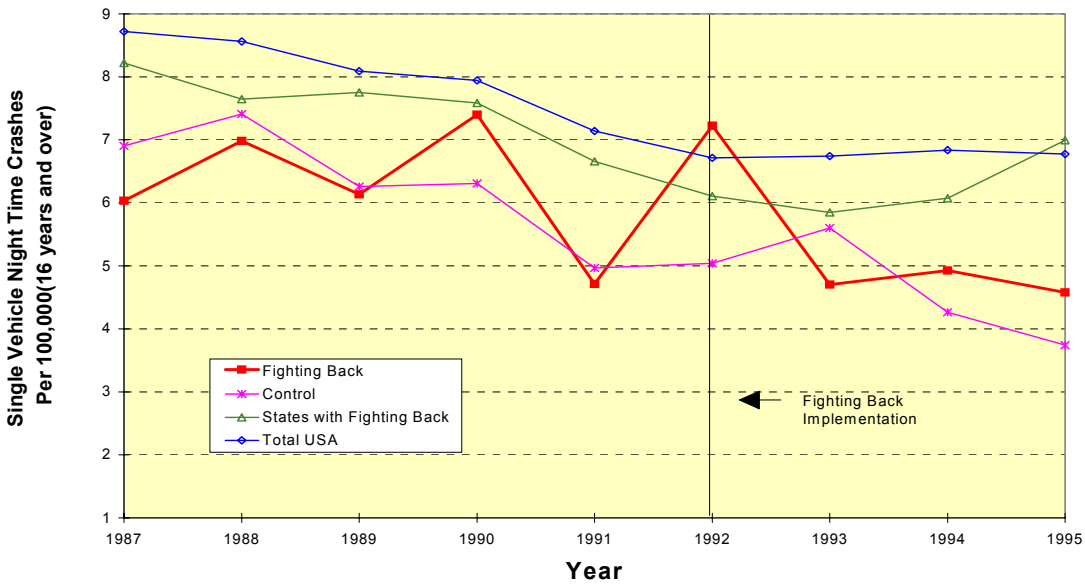
100,000 population per year, while Charlotte, San Antonio, and Little Rock average almost 8 incidents.



As noted earlier, the evaluation design was developed with the goal of testing the overall construct, not the effects within specific communities. Therefore, findings for *Fighting Back* and comparison sites are hereafter presented as composites. For these analyses, the *Fighting Back* site is treated as a unit. Its set of comparison sites is also treated as a unit. This means that the presented rate for either the *Fighting Back* sites or the comparison sites is actually an average of the rates of the individual sites that make up that group. These composite rates allow one to examine the general trend in *Fighting Back*, in the comparison sites, in the United States, and in the states which house *Fighting Back* at one time.

Figure 17 presents these trend lines for the rate of SVNCs per 100,000 population older than 16. In general, the rates in *Fighting Back* and comparison sites are lower than those for the total USA and for the states containing *Fighting Back* sites. In addition, the trends are all downward, though the line for the *Fighting Back* comparison sites are not as smooth as the national and state trends. This could be due to the small number of sites and events. It also could be due to reporting differences, since the small number of events means that a few extra events in any one year might serve to skew the results. Statistical tests, both of the change in rates over time and in the differences between *Fighting Back* and the comparison sites, will be done by employing a similar multi-level model as that used to examine the crime data.

Figure 17. Single Night Time Vehicle Crashes per 100,000 (16 and older), combined Fighting Back Sites and Comparison Sites.



Analysis is of the FARS data continues and future analyses will:

- Add additional years of data as it becomes available.
- Add information on crashes occurring within the study zip codes and elsewhere. This will make it possible to analyze where *Fighting Back* residents are crashing, as well as understand what non-residents are crashing in or near *Fighting Back* areas.

Historical U.S. trends in alcohol-involvement have been influenced by other traffic risk variables. For example, between 1977 and 1984, Zobeck and colleagues (1986) found that the apparent small increase in alcohol-related fatalities (using BAC test results) was confounded with changes in the number of vehicle miles traveled, the number of registered vehicles, and the number of licensed drivers. The Center for Disease Control further reports that alcohol-involvement in traffic fatalities is associated with several factors external to a state's traffic safety program, including the proportion of the population that is male, the degree of ruralness, and the vehicle mix (motorcycles versus heavy-trucks; CDC, 1994).

The FARS data will be modeled in the same manner as the other indicator data. Since the average rate is so low, time trends may be impossible to estimate. Instead, the trend will be assumed to be flat. In this way, it will be possible to test the impact the effect of the *Fighting Back* implementation.

Hospital Discharge Data

Of all the data sources considered, the hospital discharge data proved to be the most costly to obtain in a form that would enable disaggregation of the data to the site level (as defined by zip code boundaries). The rationale for this data archive as an indicator of substance abuse related harm is briefly reviewed and the results of our investigation into data acquisition are summarized below.

Rationale

Drug and alcohol use is associated with other illnesses (cf. Winick, 1992), many of which require hospital stays. Substance abuse-related hospital stays are thus another key indicator of harm associated with alcohol and other drug use and abuse. Hospitalizations are the most costly form of medical care and hospitals maintain the best records useful for identifying substance abuse-related problems.

In ten of the twelve states where there are *Fighting Back* or comparison sites, a state mandated hospital discharge data file exists. All *Fighting Back* sites appear to be within states that have at least some data reporting. Acute hospital discharge records are frequently maintained by a state agency, a state hospital association, or a data consortium. The reports of two entities, the American Hospital Association and the Health Care Finance Administration, were reviewed to help assess the quality of state hospital discharge data sets.

Similar to death data, substance abuse related hospital cases are identified by diagnoses associated with the use of alcohol and other drugs using the ICD-9 codes. Two related indicator indices are:

> Alcohol-related cases: hospital stays for the treatment of alcohol abuse disorders and for diseases and injuries directly attributable to alcohol use, identified by ICD-9 codes.
>
> Drug-related cases: hospital stays for the treatment of drug abuse disorders and for diseases and injuries directly attributable to drug use, identified by ICD-9 codes.

Some hospital cases could have diagnoses related to more than one substance, and care should be taken to count those cases only once or to note how many hospital cases are counted under two or three measures. This approach has recently been taken by Merrill, et. al. (1995).

Progress and Contacts

Each of the agencies responsible for these files was contacted. A protocol was drafted for data request. Table 9 presents the availability of the data and their cost by year.

Table 9 - Available Hospital Discharge Data For *Fighting Back* States

STATE	YEARS	RECORDS (Year)	COST (1996)
California	1988--	3.50 million	$ 940
New Jersey	1988--	1.30 million	$ 1,600
Wisconsin	1989--	.67 million	$ 740
Massachusetts	1988--	.90 million	$ 500
Connecticut	1990--	.39 million	$ 500
North Carolina	1988--	.42 million	$ 500
South Carolina	1988--	.40 million	$ 404
Missouri	1993--	.80 million	$ 500
Texas	1988--	3.00 million	$ 1,000
Total One Year		11.38 million	$ 6,684
Total All Years (est.)		144.61 million	$ 82,652

Releases 1 and 2 of the HCUP-III Nationwide Inpatient sample (NIS) were also examined. This set of data developed by the Agency for Health Care Policy and Research (AHCPR) contains a random sample of hospitals. An insufficient number of hospitals in *Fighting Back* and comparison sites were contained in the sample to make use of this data source feasible (see Table 10). The AHCPR project also included a State-wide Inpatient Sample (SID) which contained data (in common format) from 12 states for the years 1988-1992. This project was halted. Thus, in order to obtain Hospital Discharge data that could be disaggregated to the site-level, data would have to be obtained directly from the state agencies involved.

Furthermore, the way in which data were customarily released meant that special releases might be needed in some cases. Because of the nature of the *Fighting Back* intervention, it was important to have age and zip code for all cases. In some states, including California, this required a special release.

Table 10 - Number Of Hospitals Included In *Fighting Back* And Comparison Sites In 1993 HCUP

Site	Number of Hospitals	Site	Number of Hospitals
California		***Massachusetts***	
Santa Barbara	0	*Worcester*	1
Santa Monica	0	Fall River	0
Carlsbad	0	Lowell	0
Vallejo	0	Springfield	0
San Bernardino	0	***New Jersey***	
Stockton	2	*Newark*	2
Connecticut		Camden	1
New Haven	1	Jersey City	0
Hartford	0	***Wisconsin***	
Waterbury	0	*Milwaukee*	1
Maryland		Madison	2
DC	0	Racine	1
Baltimore	1		

Attempts were made to coordinate data acquisition with Mathematica Policy Research and other entities. A cooperative agreement to share data with COSMOS corporation, the evaluators of the Partnership program, also did not prove feasible.

At this point three possibilities present themselves:

1. Abandon the Hospital Discharge Data as an indicator for the evaluation.
2. Make an immediate commitment to pursue it actively and begin acquiring the eight or nine years of relevant available data.
3. Acquire one year of the Hospital Discharge data and evaluate its likelihood to be a useful indicator.

Each of these scenarios present potential drawbacks and opportunities. The Hospital Discharge indicator remains the most proximal unobtrusive indicator for the prevalence of AOD-related health problems. An attempt to use emergency room data was not successful because of the unavailability of records. Hospital stays are at a much higher rate than deaths in a given community. For instance, where there might be between 20 and 40 directly related substance abuse deaths, one might find several hundred hospital stays.

At the same time the data are expensive. They are in different formats from state to state, and will require a large investment of time and effort to acquire and process. Furthermore, since they use ICD-9 codes, which are arrayed into DRG's (Diagnostic Related Groups) for reimbursement by insurers, they are subject to changing coding practices. This may be

exacerbated by the recent move to managed care and reductions in state budgets. North Carolina, for instance, quit collecting the data altogether for six months while the data collection agency was changed.

If option 1 is followed the resources may be used for other data collection such as treatment patterns. Such data may have similar drawbacks. If option 2 is followed a major commitment of resources will be made with no guarantee of meaningful outcome. If option 3 is followed, then a proper assessment can be made before such major investment. It should be noted that virtually all published work making use of these data have either used the National Hospital Discharge Survey, which is in a common format for many years, or only one year of data or data from one or a few states. The acquisition contemplated for the *Fighting Back* evaluation is unprecedented.

Integrating Indicator, Survey, and Demographic Data

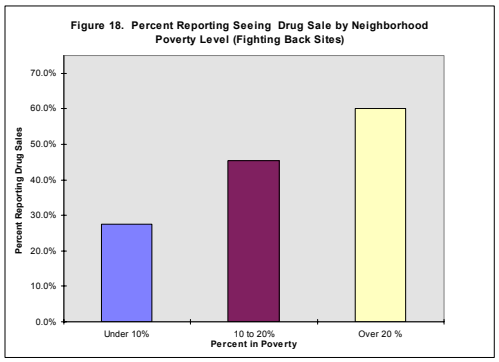
One of the fundamental premises of the national evaluation has been "triangulation": the confirmation of findings from more than one source. For the localities involved, a tremendous amount and range of data bearing directly and indirectly on AOD problems has been collected. For all communities, a series of demographic indicators, AOD indicators, and survey data have been arrayed. During the effort to directly approach Police Departments, information was requested about whether or not "geo-referenced" crime data existed. In many cases, such data was available. At the same time, tremendous efforts were expended to create geo-referenced survey data. All demographic data are mappable using Census geographies. Finally, some of the substance abuse health related data are also mappable, if address information can be provided.

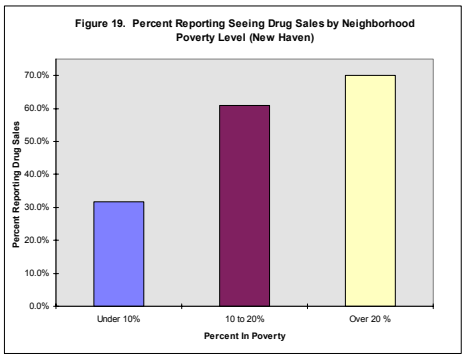
Using these sources, a series of questions can be addressed that directly bear upon how AOD problems affect given communities. At the same time, they also can help in the shaping and targeting of programs addressing such problems[15].

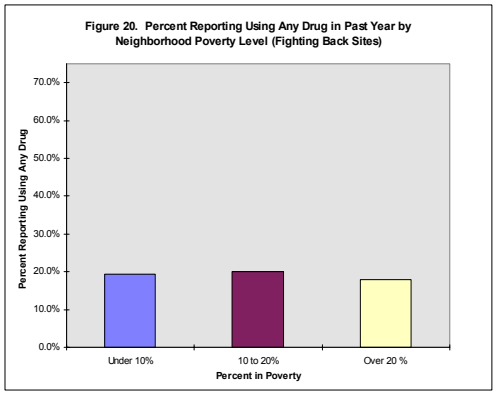
The first of these questions is the relationship of poverty, joblessness, welfare dependency, female headed households and high-school dropouts to AOD problems. While some see AOD problems as affecting "whole communities" in similar ways regardless of such factors, others have argued that AOD problems are a direct result of such factors. The linking of the survey data to demographic factors can shed some light on this question. The first map shows poverty level throughout New Haven and the classification of respondents by whether they have used any illicit drugs during the past year (see p. 44). As is apparent, though there may be some relationship between poverty status and drug use, it is still the case that those in low poverty neighborhoods as well as high poverty neighborhoods report drug use. Indeed, when answers to this question are tabulated using the geo-referenced survey data, in general one finds no relationship between drug use and the level of poverty in a neighborhood. Furthermore, this finding is replicated using the National Household Survey of Drug Abuse (NHSDA) for 1993, which also has poverty level by neighborhood.

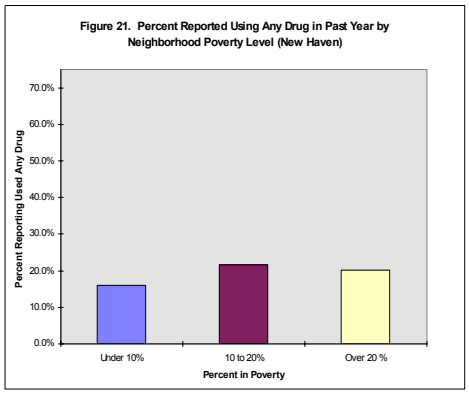
[15] The material in this section formed part of the basis of the paper presented recently at the Eastern Sociological Society, (Beveridge, et al, 1997).

When one considers visible drug problems, however, the pattern is very different. As the second map shows (see p. 45), while some people in low poverty neighborhoods see drug sales, it is still true that virtually everyone in high poverty neighborhoods report seeing drug sales. This finding holds true for both the geo-referenced survey data from *Fighting Back* and the NHSDA for 1993. Figures 18-21 below report those findings.









The next two maps of New Haven (p. 46-47) look at drug arrests and burglaries as related to reported drug sales in the neighborhood. To a large extent the drug arrests do seem to follow the same pattern as the reported drug sales. Burglaries are concentrated in areas with high degree of reported drug sales.

The integration of the indicators with survey and demographic data definitely sheds light on AOD problems in New Haven. Drug arrests, burglaries, reported drug sales and poverty level are all highly related. At the same time, drug use seems to follow a more widespread pattern. In New Haven drug use seems to be a community wide problem. The negative factors associated with drug sales are much more concentrated.

To help in untangling the local nature of AOD problems by community, efforts will be made to collect more geo-referenced data in the next phase of the *Fighting Back* National Evaluation.

Conclusion and Next Steps

The Community Indicators component of the evaluation provides substantial evidence with which to evaluate the effects of *Fighting Back* on harms within the community. The data examined thus far (AOD-related crime and deaths), provide estimates of the trends in prevalence of community harm prior to and during the just the initial phases of program implementation. A sufficient test of the *Fighting Back* effect will require analysis of additional years of data to examine whether significant changes in trends have occurred and whether *Fighting Back* has a lasting impact on harms within the community.

Once the independent analysis of each of the indicators (UCR, substance abuse deaths, and FARS) is completed, the indicators will be used to create overall rates of alcohol and drug use, abuse and harm by combining all of the archival sources of data. This technique, often used in assessing health status, has a number of virtues. It is not completely dependent on the change in one item (for example, cirrhosis of the liver and fatal accidents) and addresses the problem of low rates for some of the indicators (for example, single vehicle night-time crashes). It also allows alcohol and other drug use and harm to be presented in a way that can be easily understood.

The NIAAA has used a similar technique in the past to classify counties according to the severity of their alcohol problems. The evaluators will work closely with NIAAA, NIDA, and other experts as the indices are developed. A technical advisory panel to review all proposed indices will be created, and indices will then be computed for all *Fighting Back* sites and their comparison sites for which valid information is available.

The strategy will be to construct an overall substance abuse index, an alcohol index, and an other drug index for each community. A simple sum may be appropriate, but in general indicator data will be weighted by attributable risk fractions which will be based on the literature or on expert consultation. Preliminary analyses will determine which index is most appropriate for final analyses. Where the incident data allow, the indices will be created separately for major race groups and will be adjusted for age. This practice is standard for health indicators, but will be used for arrest data as well.

The indicator data, singly and if combined, will also be integrated with other sources of data from the evaluation. For example, using the evaluation of MIS and information from the community studies, *Fighting Back* sites might be classified by the number and strength of initiatives that directly target traffic crashes. Since the sites vary in their degree of implementation of relevant initiatives, this classification may be used in later statistical modeling of the indicator data.

References

CDC, Fell, J. C., & Klein, T. M. (1994). Update: Alcohol-Related Traffic Fatalities--United States, 1982-1993. Journal of the American Medical Association, 272, 1892.

Center for Addiction and Substance Abuse. (1993). The cost of substance abuse to America's health care system, report 1: Medicaid hospital costs. New York: Columbia University, CASA.

Cook, P.J. (1981). Relationship of price, consumption, and cirrhotic mortality. In: Harold Holder and Jerome Hallan (Eds.), Control Issues in Alcohol Abuse Prevention: Local State and National Designs for the 80's. Charleston, SC., 89-94.

Fagan, J., Joseph, W., & Cheng, Y.-T. (1990). Delinquency and Substance Use Among Inner-City Students. Journal of Drug Issues, 20 (3), 351-402.

Fox, K., Merrill, J. C., Chang, H., & Califano, J. A. (1995). Estimating the Costs of Substance Abuse to the Medicaid Hospital Care Program. American Journal of Public Health, 85, 48-54.

Goldstein, P., Belluci, P., Spunt, B., & Miller, T. (1991). Volume of Cocaine Use and Violence: A Comparison Between Men and Women. Journal of Drug Issues, 21 (2), 345-367.

Goldstein, H. (1995). Multilevel Statistical Models. London: Edward Arnold: New York, Wiley.

Goldstein, H. and Rasbash, J. (1996). Improved approximations for multilevel models with binary responses. Journal of the Royal Statistical Society, A (159), 385-443.

Haberman, S. J. (1978). Analysis of qualitative data: Volume 1. New York: Academic Press.

Harrison, L. (1992). The Drug-Crime Nexus in the USA. Contemporary Drug Problems, 19 (2), 203-245.

Harrison, L., & Gfroerer, J. (1992). The Intersection of Drug Use and Criminal Behavior: Results From the National Household Survey on Drug Abuse. Crime & Delinquency, 38 (4), 422-443.

Hingson, R., McGovern, T., Howland, J., Heeren, T., Winter, M., & Zakoes, R. (1996). Reducing Alcohol-Impaired Driving in Massachusetts: The Impact of the Saving Lives Program. October 24, 1995.

Holder, H., & Wagenaar, A. (1994). Mandated Server Training And Reduced Alcohol-Involved Traffic Crashes: A Time Series Analysis Of The Oregon Experience. Accid. Anal. and Prev., 26, 89-97.

Horgan, C., Marsden, M. E., & Larson, M. J. (1993). Substance Abuse: The Nation's Number One Health Problem, Key Indicators for Policy. Princeton, NJ: The Robert Wood Johnson Foundation.

Inciardi, J. A., & Pottieger, A. E. (1991). Kids, Crack and Crime. Journal of Drug Issues, 21 (2), 257-270.

Kadushin, C., Killworth, P. D., Bernard, H. R., & Beveridge, A. (1997). Drugs, Booze, Murder, Assault, Fatal Crashes, and the Small World. February 14, 1997.

Mays, G., Fields, C., & Thompson, J. (1991). Preincarceration Patterns of Drug and Alcohol Use by Jail Inmates. Criminal Justice Police Review, 5 (1), 40-52.

McBride, D., & McCoy, C. (1993). The Drugs-Crime Relationship: An Analytical Framework. The Prison Journal, 73 (3/4), 257-278.

McGinnis, M., & Foege, W. (1993). Actual Causes of death in the United States. Journal of the American Medical Association, 270, 2207-2212.

National Center for Health Statistics (1995). Births, marriages, divorces, and deaths for 1995. Monthly vital statistics report; vol. 44 no 12. Hyattsville, MD: Public Health Service 1996.

National Highway Traffic Safety Administration (1993). Fatal Accident Reporting System 1991: A Review of Information on Fatal Traffic Crashes in the United States in 1988. Washington, D.C.: U.S. Department of Transportation, National Highway Traffic Safety Administration.

National Institute of Justice. (1994). U.S. alcohol epidemiolgic data reference manual: County alcohol problem indicators, 1979-1985 (3rd ed.). Washington, D.C.: National Institute of Justice.

National Institute on Drug Abuse. (1990). Household survey on drug abuse: Main findings, 1988. Washington, D.C.: U.S. Government Printing Office.

National Safety Council (1993). Accident Facts. (p. 20) Itasca, Ill: Author.

Pequignot, G. and Tuyns, A.J. (1984). Thresholds for damage. Pharmacological Treatments for Alcoholism. New York, 219-228.

Ravenholt, R.T. (1980). Addiction Mortality in the United States, 1980: Tobacco, Alcohol, and Other Substances. Population and Development Review, 10 (4), 697-724.

Reduction in Alcohol-Related Traffic Fatalities-United States, 1990-1992 (1994). Journal of the American Medical Association, 271(2), 100.

Rice, D. P., Kelman, M., & Dunmeyer. (1990). Mortality Costs. In The Economic Costs of Alcohol and Drug Abuse and Mental Illness (pp. 117-144,153-204).

Saxe, L., Kadushin, C., Beveridge, A., Hallfors, D., Jones, D., Winick, C., & Rindskopf, D. (1994a). Evaluation of Fighting Back. (N)

Saxe, L., Kadushin, C., Beveridge, A., Hallfors, D., Jones, D., Winick, C., & Rindskopf, D. (1994b). Fighting Back evaluation update.

Saxe, L., Kadushin, C., Beveridge, A., Hallfors, D., Winick, C., Huselid, R., Williams, T., & Rindskopf, D. (1994c-c). Evaluation of Fighting Back.

Saxe, L., Kadushin, C., Beveridge, A., Hallfors, D., Jones, D., Winick, C., Larson, M. J., Rindskopf, D., & Reber, E. (1995a). Evaluation of Fighting Back. Unpublished Manuscript, City University of New York, Graduate Center.

Saxe, L., Reber, E., Kadushin, C., Beveridge, A., Larson, M. J., Rindskopf, D., Livert, D., Marchese, J., Stirratt, M., & Weber, S. (1995b). Fighting Back Evaluation Interim Report.

Scheider, V. and Weirsema, B. (1990). Measuring Crime. Limits and use of the uniform crime reports. State University of New York Press, Albany, NY.

Sells, W., & Blum, R. (1996). Morbidity and Mortality among US Adolescents: An Overview of Data and Trends. American Journal of Public Health, 86, 513-519.

Serdula, M., Koong, S.-L., Williamson, D., Anda, R., Madans, J., Kleinman, J., & Byers, T. (1995). Alcohol Intake and Subsequent Mortality: Findings from the NHANES I Follow-up Study. Journal of Studies on Alcohol, 233-239.

Shultz, J. M., Rice, D. P., Parker, D. L., Goodman, R. A., Stroh, G., & Chalmers, N. (1991). Quantifying the Disease Impact of Alcohol with ARDI Software. Public Health Reports, 106, 443-450.

Sloan, F., Reilly, B., & Schenzler, C. (1994). Effects of Prices, Civil and Criminal Sanctions, and Law Enforcement on Alcohol-Related Mortality. Journal of Studies on Alcohol, 454-465.

Stinson, F. S., & Debakey, S. F. (1992). Alcohol-related mortality in the United States, 1979-1988. British Journal of Addictions, 87, 777-783.

Stinson, F. S., Dufour, M. C., Steffens, R. A., & DeBakey, S. F. (1993). Alcohol-Related Mortality in the United States, 1979-1989. Epidemiologic Bulletin, 17, 251-260.

Turner, C. F., & Miller, H. G. (in press). Monitoring trends in drug use: Strategies for the 21st century. The International Journal of the Addictions.

Winick, C. (1992). Epidemiology of alcohol and drug abuse. In J. H. Lowinson, P. Ruiz, R. B. Millman, & J. G. Langrod (Eds.), Substance abuse: A comprehensive textbook (2nd ed., pp. 15-29). Baltimore: Williams and Wilkins.

Zobeck, T. S., Stinson, F. S., Grant, B. F., & Bertolucci, D. (1993). Trends in alcohol-related fatal traffic crashes, United States 1979-1991. Surveillance Report #26.