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AMERICAN JAIL DEATH-RATES:

A COMPARISON OF THE 1978 AND 1983 JAIL CENSUS DATA*

by

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ABSTRACT

This paper provides insights into the problem of jails deaths in America by drawing upon relevant data from the 1978 and 1983 National Jail Censuses and other official sources. The goals of the research were (1) to evaluate national death rate trends in and out of jail and (2) to analyze state-wide trends in both 1978 and 1983, in order to determine if those factors that provided insights into the incidence of jails deaths in the earlier census continued to yield the same level of explanatory power in the latter. Indeed, we found that, when an adjusted general population ("free society") death rate is employed, the death rates for certain causes are actually lower in jails. This generalization, while true for natural causes and homicides, was not the case for suicides. Depending on which general population rates are compared with which jail rates, inmates committed suicide at a rate that was between five and 15 times higher than the rate for free citizens. The general trend in jail death rates was generally downward, although once again suicide rates have tended to exhibit less of a decrease than the rates for homicides and death by natural causes. At the state level, jail deaths in 1983 were largely understood in terms of the number of people placed at risk in a state's local jails. Five and one half years earlier, jail deaths were linked not only to exposure to risk, but also a number of other state-wide aspect related to local corrections.

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INTRODUCTION

The state of our knowledge about death and dying in American jails is, by any standard, at an ebb. We know little about the jails in which inmates are dying, the states in which these jails are located, the rates at which such deaths occur, or even whether the rates are excessively high or simply demographically representative of a unique population: jail inmates. In fact, our knowledge of jails in general, relying heavily as it does on "first hand accounts", anecdotes and geographically limited studies (Goldfarb, 1975), is sketchy; and, the picture of jail life---and death---contained in the literature is not particularly appealing. For instance, a decade ago Ronald Goldfarb (1975) described American jails as the "ultimate ghetto," a characterization which echoes the message of Joseph F. Fishman's classic (1923) description of jails as "crucibles of crime". Richard Velde's comments seem to sum up the sense of despair felt by students of America's jails: "[Jails are] "brutal, filthy cesspools of crime---institutions which serve to brutalize and embitter men to prevent them from returning to a useful role in society" (Bartollas, 1981:210).

Dying in American Jails

Suicide, perhaps more than any other jail event except a riot, captures public attention and typifies the problems of death and dying in American jails. Bruce L. Danto (1973:19-21, 34) observes that the suicide rate for jail residents was three and one-half times that of the national non-jail population. Goldfarb (1975:115) contends that jail staff have been represented as untrained and unprepared to deal with the

jail suicide problem. This fact, Goldfarb believes, is only a relatively small part of the total jail death and jail suicide problem. Far too often management's system of jail priorities (e.g., effectiveness and security) and the insensitivity of line staff to the harsh realities, or unrealities, faced by inmates exacerbate the problem (Goldfarb, 1975:115).

Besides Danto's regionally limited accounts, what we know about jail deaths is contained in a handful of studies (cf., Flaherty, 1983; Guy et al., 1985; Hayes, 1983; Kennedy, 1983, 1985). The general topic of dying in jail, which itself occurs with admitted regularity, has been largely overlooked by social scientists. Most of the extant suicide research remains either (1) highly speculative with little "hard facts" to corroborate the author's conclusions or (2), if available data are used, the findings are suspect due to questionable analytical techniques or problems with conceptualization and/or operationalization processes.

The problem of jail death data is perhaps best summed up in a single statistic: Jail inmates are 16 times more likely to commit suicide than are members of the free community (Flaherty, 1983; Hayes, 1983; see also Bowker, 1982; Snarr and Wolford, 1985). The line of reasoning underlying this rate is fairly straightforward. There are about 200,000 people in American jails on any given day; there are about 400 suicides per year in American jails; an American city with a population of 200,000 persons has a suicide rate of approximately 25 per year; thus, inmates are 16 times more likely to commit suicide than their peers in the free society (see Flaherty, 1983; Hayes, 1983).

The folly in this and similarly constructed rates is three fold. First, while children do commit suicide, this activity is not an equal risk behavior among all 100,000 residents of the fictitious city.

Analysts of the Uniform Crime Reports have pointed out that the rates can and do differ significantly if one uses the total population instead of an "at risk" population (Chilton and Spielberger, 1970; Saqi and Wellford, 1968). Consequently, the suicide rate for the "at risk" people in the general population is probably considerably higher than 12.5 per 100,000. Second, jails are primarily (90 plus percent) adult male bastions; the racial balance of jails rests slightly in favor of Caucasians. Few cities of 200,000 population share these particular characteristics. Finally, while on any given day approximately 200,000 inmates may temporarily reside in American jails, some 12 to 13 million pass through their gates each year. Few American cities experience this rate of in- and out-migration on an annual basis. As a result, comparing the average daily jail population to an "average" American city of 200,000 seems a rather fallacious line of reasoning to follow.

Jail Mortality: What to Study?

Mortality is a complex social issue which is incapable of being adequately represented through a single number or index (Barclay, 1958:123). Most mortality rates are specific. That is, the rates pertain to some specified portion of the population. They may even represent only a particular mode of death, such as accidental death, suicide, homicide and the like, for a given portion of the larger population. As a result, the selection of the type of death rate to be discussed is identical to the selection of some particular aspect of mortality for study (Barclay, 1958:124).

The present study focuses on four death rates, including general mortality (based on the sum of all deaths irrespective of mode of death), suicide, homicide and natural causes.[4] General mortality is used

in the initial segments of the analysis to provide some basis of comparison with other available general mortality rates. There is, of course, a problem with this particular statistic in that many modes of death that are part of the general mortality rate of the general population are rare or non-existent events in jails. For instance, few women die in childbirth or, for that matter, few infants die from any cause in jail. Death by automobile accident is virtually unknown in jail, unless the victim is being transported at the time, and then it is questionable as to whether the death would be recorded as a "jail death". Consequently, we anticipate that unless jails pose an inordinate threat to human life, the overall death rates of jails should be lower per 100,000 or 1,000 jail inmates than the overall death rates for the general population.

Suicide, as we have previously indicated, represents a unique organizational, legal and public relations problem for American jails, or so the extant literature suggests (cf., Bowker, 1982; Danto, 1973; Flaherty, 1983; Hayes, 1983; Snarr and Wolford, 1985). Suicide rates represent the risks of committing suicide in either the population at large or the jail population. Yet not only may certain places pose a higher suicide risk, but certain segments of the jail population, by reason of shared characteristics, face even greater risk of suicides. That is, jails, especially the holding facility (24 hours or less), contain many individuals that fit the profile of suicide-prone individuals (Bowker, 1982; Hayes, 1984).

If someone is determined to take the life of another, or even his or her own life, there is little that any formal organization can do in the long term to prevent the death from occurring. Electronic surveillance, death watches, and even isolation have proven to be

inadequate defenses against a determined perpetrator. In spite of these facts, jail homicides, as opposed to what we suspect is a much higher but unreported rate for jail assaults, remain rather rare jail events. Nonetheless, we have elected to include them in the initial segments of the analysis due to the "predatory" nature of the crime.[2]

Deaths by natural causes are the final cause-specific mortality statistics that were evaluated in the current study.[3] People do suffer cardiac arrest in jail or die of hepatitis, influenza, pneumonia, and many other naturally occurring disorders. But very few jail inmates die a lingering death from cancer or other long term illnesses; and most deaths due to childhood disorders are, by legal definition, unlikely jail occurrences. As a consequence, we anticipate that, unless jails truly do place inmates at unusual risk to death by natural causes, jail mortality rates for this category should be lower than those evidenced in the general population.

Estimating Population Bases and Calculating Death Rates

The 1978 Jail Census was intended to represent the state of American jails as of February 15, 1978, although the death rates were for the 1977 calendar year. The 1983 Jail Census reflected jail operations as of June 30, 1983; the information relative to inmate deaths was for the period July 1, 1982 to June 30, 1983. These shifting dates typify the analytical problems related to rate-base selection that are endemic to the 1978 and 1983 Jail Census data. Any rate or ratio can only be interpreted in terms of the base that is used to create it (Barclay, 1958: Chapter 2). In the present instance, there is, first, the problem of selecting the most appropriate years to use in calculating the general comparative free society rates. Second, there is the need to develop

national equivalent population rates against which to compare jail death rates, in which case the former, national death rates should logically be adjusted to reflect the unique character of jail populations (Barclay, 1958; see also, Greenfield, 1982). As with the general comparative figures, the decision-making process involved in creating an equivalent population rate includes the selection of the most appropriate (and most defensible) years, as well as logical decisions as to which groups should be included in or excluded from the population base.

Beyond these issues, we are especially sensitive to the base selection question since the creation of an appropriate jail population base for jail death rates constitutes one of the research goals of this project. As has already been observed (cf., Chilton and Spielberger, 1971; Sagi and Wellford, 1968), there is a need to develop death rates that more accurately reflect the "at risk" jail population than those that use the one day or average daily populations as the base. In a given year, just how many people are truly at risk of dying in American jails? We suggest that this figure lies somewhere between the one day average population and the total number of individuals that move through the turnstiles that are this nation's jails.

Research Questions

The following questions constitute the framework around which this report is structured:

(1) What was the overall death rate for American jails, as well as the cause-specific rates?

(2) At the aggregatized data level, what structural features of jails statewide and other extra-institutional aspects of local and state corrections are linked to jail deaths in 1977 and 1982?

METHODS

The Data

This report consists of a secondary analysis of two separate censuses of American jails conducted five and one-half years apart. The data were collected in 1978 and 1983 by the United States Bureau of the Census for the United States Bureau of Justice Statistics. The censuses were authorized by the Omnibus Crime Control and Safe Streets Act of 1968, as amended (42 U.S.C. 3732). In both censuses, a complete sample was attempted; the criteria for inclusion were identical for both censuses. That is, the intended universe for both censuses consisted of all local jails that held inmates beyond arraignment, a period of time usually more than 48 hours, and that were administered and staffed by local officials, usually city or county/parish employees. Complete descriptions of the data collection process are available from a number of different sources (U. S. Department of Justice, 1979, 1981, 1984). Suffice to say, both censuses reported a coverage rate in excess of 99 percent. The 1978 census contained data for 3,493 local jails; a total of 3,358 jails were included in the 1983 census.

The Variables

Death Rates. Several solutions to the problems associated with population base selection were employed in the present research. One approach is to present the national mortality rates, general and cause specific, for a comparable period of time. This tactic has been employed in a number of cases (e.g., Flaherty, 1983; Hayes, 1983). While we are critical of this approach, we nonetheless include these rates in our report for comparison purposes.

A second approach is to employ a "general population equivalent" rate, a method similar to that employed by Greenfield (1982)

in his study of prison death rates. Using this latter approach, also referred to as an adjusted or standardized death rate by demographers (Barclay, 1958:161-2), one determines the total number of individuals in whatever "at risk" populations are to be included in the study, which is used as the denominator. The total number of deaths for this target population is used as the numerator. The next step is to determine the weighting factor. Given the fact that adult males constitute in excess of 90 percent of the jail population (Bowker, 1982; Keve, 1983), the target population consists of adult males only. Thus, we had to make adjustments for two additional "principal target groups" present among adult males in the jail population: Caucasians and non-Caucasians. This step was mandated by the rather significant differences in "free society" (i.e., non-jail) mortality rates for Caucasians and non-Caucasians (U. S. Bureau of the Census, 1979, 1980, 1983). As independent research has shown, jail populations are typically over fifty percent Caucasian (U. S. Department of Justice, 1980, 1983, 1984). Consequently, the mortality rates for adult male Caucasians was multiplied times the percent of the national jail population that was, in the target year, Caucasian, while the mortality rates of adult male non-Caucasians was multiplied times the percent of the national jail population that was in that same year non-Caucasian.

Ideally, the construction of a general population equivalent rate will allow us to compare the mortality rate of the incarcerated group to the adjusted rate of a similar group of individuals in the free society. Unfortunately, this method requires that information relative to sex-race-age specific mortality figures be available. Rates for sex-race-age specific groups are not readily available for overall mortality

let alone cause-specific deaths. Consequently, the researcher must calculate these rates from the raw death figures collected by the U.S. Department of Health and Human Services's National Center for Health Statistics.[4] Race and sex specific data for the general population were readily available from the National Center for Health Statistics's Annual Mortality Reports (hereafter referred to as the Reports). The Bureau of the Census age groups do not conform to the typical groupings for criminological research. As a consequence, the age range for the General Population Equivalent group was 15 to 64.[5]

Once the age-sex specific death rates for the two racial groups were calculated, the next step was to weight them and sum the results to obtain an overall equivalent rate. In 1977, Caucasians constituted roughly 57 percent of the jail population; by 1982 they made up 58 percent of the jail population (U. S. Department of Justice, 1980, 1984). The age-sex specific rates for Caucasians were multiplied times 57 percent for the 1978 census and 58 percent for the 1983 census. The results were summed with the similarly weighted rates for non-Caucasian adult males in the respective year.

A third type of mortality rate that frequently finds its way into jail death studies (cf., Hayes, 1983; Flaherty, 1983) is simply the gross number of deaths reported in a given year, general or cause-specific, divided by the total number of individuals housed in those jails on a given day, irrespective of age, sex, or race. In keeping with this tradition, we too report such a rate.

As previously stated, we are primarily concerned with the deaths of adult male jail inmates. Adult males traditionally accounted for slightly in excess of 90 percent of the jail inmates in America. It is conceivable that more or less than 90 odd percent of the deaths in any

given census---especially cause specific deaths---involved adult males. Thus, the death rates for male jail inmates, general mortality as well as cause-specific, are included in this report.

The final death rate included in the current study reflect our concern for considering the total number of persons at risk. As previously stated, to base rates on the static one day jail population or the average daily population is to overlook the millions of individuals that annually pass through America's jails, if only briefly. We contend that some measure of the exposure- to-risk factor should be included in jail death rates. One method of including an appreciation for the exposure factor in death rates is to base the estimate on the total number of "person-years at-risk" accounted for by the several million temporary residents of American jails (Barclay, 1958:37-8, 161-66). A minimal prerequisite for this figure is an estimate of the time of exposure to risk (sentence lengths) for each member of the target population (jail inmates). Ideally we would know the exposure to risk for each individual of the target population. However, even the average jail sentence is rarely collected even on a local level. And the Bureau of the Census did not collect a direct measure of the average stay.

The BJS Bulletin entitled "Jail Inmates 1982" (U. S. Department of Justice, 1983) included an average jail stay figure of 11 days. This estimated figure was based on the number of days that it would take, on average, a fixed jail population to reproduce itself, given certain rates of egress (Kalish, 1985; Stephan, 1985). This method was employed in the current study in the person-years at-risk rates. That is, the average daily population was divided by the number of inmates released on an average day. The resulting figure, the average

stay in days, was then multiplied by the average daily population plus yearly admissions and the resulting figure divided by 365. Estimates of these data points were available in both data sets. Obviously, any "average stay" will be subject to wide variation, but averages and person years at-risk based on institutional level data should account for geographic variability.

Jail Characteristics The following characteristics of jails and jail populations were included in the present study: rated bed capacity, average daily population, average daily releases, average daily admissions, average jail stay, percent of average daily population which has not been convicted of a crime, and percent of average daily population that has been assigned to the jail due to overcrowding of state or federal correctional institutions. Only the rated bed capacity question appeared without change on both instruments.

The average jail stay was estimated by employing the method used by the Bureau of Justice Statistics, which consisted of dividing the average daily population by the average daily releases (see note 6). As sometimes happens in censuses, somewhat different items were used to measure the same characteristics in 1978 and 1983. Estimates of the average daily admissions and average daily releases for 1978 were obtained by dividing the reported weekly rates by seven. The 1983 population movement statistics were available for the entire year only. These figures were respectively divided by 365 to give an estimate of the average daily admissions and releases.

The 1978 census forms included several questions concerning the number of inmates currently residing in the facility that had not yet been convicted of a crime, misdemeanor or felony. These questions resulted in the total number of persons not yet arraigned and the total

arraigned and awaiting trial or being tried. These figures were summed and divided by the total population figures in the jail on the census day (the total upon which they were supposedly based) to give a percentage of the total population which has not yet been convicted of a crime. The 1983 form broke down non-convicted status by age and sex, but did not distinguish between those awaiting arraignment or trial and those being tried. The total number of non-convicted individuals was divided by the total inmate population on the census day. The product was an average percentage of the inmate population not yet convicted of a crime.

The final inmate population characteristic consisted of the percentage of all inmates which had been assigned to the jail due to overcrowding at state or federal correctional facilities. The 1978 form contained three separate reasons for holding inmates for other authorities, one of which was overcrowding. This figure was again divided by the total inmate population, and was considered to represent the percentage of the total inmate population held due to overcrowding. By 1983 the increasingly sensitive issue of overcrowding necessitated the collection of more finite data. There were a total of 16 categories related to inmates held for other authorities, of which four were specifically dedicated to overcrowding (i.e., federal-illegal aliens, federal-other, state, and other counties or cities). As in 1978, the percentage of 1983 inmates held due to overcrowding was obtained by summing the four overcrowding categories and dividing by the total inmate population on the census day.

Staffing Patterns. The administrative, custodial and professional staffing patterns were considered to be central to any study of jail mortality rates. The professional staff included social workers,

psychologists, medical personnel and the like. The Bureau of the Census asked the person completing the census forms to differentiate between part-time and full-time and to exclude non-paid volunteers. Due to changes in the forms between 1978 and 1983, only full-time staffing patterns are included in the present study.[6]

Design of the Analysis

The data analysis was completed in two stages. The first stage consisted of comparisons of the various mortality rates for the nation's jails. Four separate types of mortality---general mortality, suicide rates, homicide rates and natural causes---were presented for the general population, general equivalent population, total jail population, adult male population and the "at-risk" adult male jail population.

The second stage of the analysis involved aggregating the data by state. This step resulted in a sample of 45 states.[7] The final series of questions were addressed to this data set. Specifically, we were interested in the extent to which certain statewide structural and extra-institutional features of American jails are independently related to the incidence of deaths by natural causes and suicides. The classic regression approach to covariance analysis, with a nonorthogonal or unbalanced design was employed. Three "new" variables were introduced as factors each respective Analysis of Variance (ANOVA). These variables were (1) statewide expenditures for local corrections per 1,000 jail inmates, (2) region and (3) court order. Statewide expenditure data were obtained for 1977 (U. S. Department of Justice, 1981b) and 1981 (U. S. Department of Justice, 1985b). Expenditures were collapsed into three categories: (1) under $5,000 per 1,000 inmates, (2) $5,000 to $10,000 per 1,000 inmates and (3) over $10,000 per 1,000 inmates.

Region reflected the part of the nation in which the subject state was located, and included northeast (Maine, Massachusetts, New Hampshire, New Jersey, New York, and Pennsylvania), north central (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin), south (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia), and west (Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming).

Finally, perhaps owing to the extremely large number of civil suits (in excess of 10,000) which have been filed against local jails, there is no current accounting of which jails have been sued or are under court order for what particular grievance (Mullen and Smith, 1980). However, it is assumed that court orders pending against the state system eventually are applied to local corrections (Sheley, 1985: 298-302). Several different lists of state and federal court orders were available. One list covered state prison systems up to 1977; it was used in the analysis of the 1978 census data (Mullen and Smith, 1980). Only seven states were under court order at that time. The affected states were Alabama, Florida, Louisiana, Mississippi, New Hampshire, Ohio, and Oklahoma. In 1982, the list had grown to include Alabama, Arizona, California, Florida, Colorado, Oklahoma, Tennessee, Texas, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Missouri, Nevada, New Hampshire, New Mexico, Ohio, Utah, Virginia, Washington and West Virginia.

In addition to the three factors, a total of seven covariates were introduced in 1978 and eight in 1983. The seven common covariates

were the number of full-time administrators, custody staff, and professional staff per 100 inmates in the state's jails, the average percentage of unconvicted jail inmates residing in the state's jails, the average jail stay, the average percentage of the state's jail population that were held due to overcrowding of state or federal facilities, and the total male person-years at-risk served in the state's jails. In 1983, the total number of statewide suicides in 1978 were included as a covariate.[8]

MORTALITY RATES IN AMERICAN JAILS: 1978, 1983

General Mortality Rates

In 1977, the general mortality rate, as reported in Table 1, was approximately 878 per 100,000 population. The 1977 general population equivalent rate---the general mortality rate adjusted for sex, age and race---was, at 656 per 100,000, 25 percent less than that for the general population group. Neither of these two rates changed markedly between 1977 and 1982.[9] This latter finding suggests that at the national level such rates were relatively immutable over time, even when normed for age, sex and race.

//Table 1 About Here//

The 1977 death rate for all jail inmates, irrespective of age, sex or race, was, at 386 per 100,000 inmates, less than one-half the general population rate and forty percent less than the general population equivalent rate. Furthermore, the jail rate for all adult males did not differ greatly from the total jail population rate. Consequently, we were inclined to believe that sex and age did not play a major role in the overall rate at which inmates die in jail. Moreover, the wide disparities between the two jail death rates and both rates for

the general population were anticipated given the fact that so many modes of death rarely, if ever, occur in jail. Comparisons of the cause-specific modes of death should at least partially resolve this problem.

It is important to note that the 1982 general death rates for all inmates and all adult male inmates were lower than those reported for 1977. There were absolute drops in the number of deaths (611 to 554 and 572 to 499, respectively) and overall increases in the reported jail populations (158,394 to 233,551 and 147,506 to 206,163, respectively). It would appear that while the general mortality rate in the free society changed little between 1977 and 1982, and the general population equivalent group decreased slightly, the unadjusted and sex-age adjusted rates for jail inmates decreased by approximately one third!

The final rates contained in Table 1 are the "at risk" rates for adult males. These rates are based on the total person-years at-risk represented by millions of inmates processed through the nation's jails in a given year. The 1977 mortality rate of 253 per 100,000 person-years at-risk is 36 percent lower than either of the other 1977 jail population rates; the 1982 rate of 206 per 100,000 person-years at-risk is 15 percent lower than the comparable 1982 jail mortality rates.

These rate comparisons prompt us to make several observations. First, the much publicized increase in jail population between 1978 and 1983 (147,506 adult males and 206,163, respectively) is less startling when one recalculates these figures in terms of person-years at-risk (226,251 adult males in 1978 *versus* 242,670 in 1983). Second, even when comparing person-years at-risk, the overall death rate per 100,000 in American jails---a rate which was relatively immutable at the national level---decreased by at least 19 percent between 1977 and 1982. Collectively, these findings suggested that either (1) death-prone

individuals or perhaps, in the case of homicide, the more dangerous persons were, by 1982, less likely to find their way into jail populations or (2) individual jails were taking pro-active steps to decrease the death rate.

Cause-specific Mortality Rates

Table 2 contains the various suicide rates for the general population and American jails. The general population experienced a suicide rate of between 12 (1982) and 13 (1977) per 100,000 individuals, a rate reported in most jail suicide reports for comparison purposes. The general population equivalent rates are between 69 (1977) and 85 (1982) percent higher than the respective rates for the general population. The unadjusted rates and the sex-age adjusted jail rates were 11 (1982) to 15 (1977) times greater than the respective general population rates and 6 (1982) to 8 (1978) times greater than the general population equivalent rates. Incidentally, it is the first of these jail suicide rates which is cited with high regularity in jail/corrections textbooks (cf., Callison, 1983; Goldfarb, 1975; Snarr and Wolford, 1985).

//Table 2 About Here//

The person-years at-risk rate reported in Table 2 followed the same general pattern as that observed for the overall mortality rate (see Table 1). While higher than those reported for either the general population or the general population equivalent group, both the 1977 and 1983 suicide rates were, at 120 and 112 per 100,000, respectively, lower than the unadjusted or age-sex adjusted jail rates. It is also interesting to note that jail suicides in both 1977 and 1982 occurred at a rate that was approximately 5 times greater than the rate observed for the general population equivalent group. While even this rate is no

cause for celebration, it is roughly one-third the rates previously cited, in spite of the fact that the base population is by definition uniquely disposed towards acts of self-destruction (Bowker, 1983).

A related observation warrants closer attention. Comparisons of the unadjusted and sex-age adjusted jail suicide rates suggested the occurence of rather startling decreases in the intervening five and one-half years. Comparisons based on person-years at-risk rates were less optimistic: the decrease barely kept pace with the national decreases. The putative changes in either system clients or organizational mandated that may have caused the overall decrease in the jail mortality rate apparently had little effect on the person-years at-risk jail suicide rate.

Jail homicides are a topic of newsworthiness and public interest second only to jail suicides. As reported in Table 3, the homicide rate for the 1977 general population equivalent group was five times greater than the rate for the general population. The unadjusted and sex-age adjusted jail rates were one-third that reported for the general population equivalent group. As expected, the person-years at-risk jail rate was fifty percent lower than either other jail rate. In fact, the person-years at-risk jail rate was only slightly higher than the general population rate (10.2 per 100,000 *versus* 9.2 per 100,000).

//Table 3 About Here//

By 1982 the general population homicide rate had increased slightly over the 1977 rate (9.2 per 100,000 *versus* 10.7 per 100,000). The difference between the general population equivalent group rate and the general population rate remained roughly the same (5 times), suggesting that the former group was not experiencing an inordinate increase. The 1982 unadjusted rate and both adjusted rates were far

lower and very similar. Between 4.1 inmates per 100,000 (person-years at-risk) and 4.8 inmates per 100,000 (all adult males) died in American jails in 1982. All of the 1982 jail rates were more than 50 percent lower than any of the 1977 jail rates. By any standard, homicide rates in American jails experienced a considerable decline between 1977 and 1982. However, this decline alone cannot account for the previously observed decrease in the overall mortality rate. After all, there were only between 23 and 24 homicides reported in all American jails in 1977 and only 10 in 1982.

The final cause-specific rates contained in this report involved deaths by natural causes. As is quickly evident from the general population rates contained in Table 4, more people per 100,000 population died of natural causes than for any of the other rates (740.6 in 1977 and 751.7 in 1982). Norming the population in terms of jail inmate characteristics, resulted in a rate that was slightly greater than half that of the general population rate in 1977 (494.6 per 100,000 and 1982 (490.2 per 100,000). Thus, while the general population rate per 100,000 increased slightly between 1977 and 1982, the rate for the general population equivalent group had declined slightly.

//Table 4 About Here//

Once again, the jail rate at which people were dying, this time of natural causes, was lower than that reported in the free society rate, irrespective of how that rate was calculated. In 1977, over 140 inmates per 100,000 died of natural causes in American jails. By 1982 this rate was approximately 90 to 95 inmates per 100,000 population. The 1977 unadjusted and sex-age adjusted jail population rates were roughly one-third that of the general population equivalent and less than one-fifth

that of the general population; the 1982 rates are approximately one-fifth the general population equivalent rate and one-ninth the general population rate.

Finally, the 1977 and 1982 person-years at-risk jail rates of 95.5 and 80.8 per 100,000, respectively, suggest that (1) the rate at which persons die of natural causes in jails is, by any standard, lower than the general population rate and (2) the natural causes death rate in jails is declining at a pace faster than the general equivalent group but slower than suggested by the unadjusted and sex-age adjusted rates. Except in the most extreme of cases, and in situations where the onset of death by natural causes is so swift as to preclude transferring the prisoner, most inmates with truly life-threatening conditions will in all likelihood be moved to a hospital or similar care facility. Consequently, as was mentioned in the discussion of the overall mortality rate, we expected and indeed found lower death rates by natural causes in jails than was the case for the general population. The fact that these rates had declined by between 15 percent (person-year at-risk rate) and approximately 36 percent (unadjusted and sex-age adjusted rates) since 1977 must be attributable to something other than good fortune, especially given the relative stability of the national rates.

DEATH RATES IN AMERICAN JAILS: AGGREGATIZED JAIL DATA

Before examining the relationships between the extra- and intra-institutional structural features of jails and various modes of death, a potential problem involving state-wide death rate rankings merits attention. Table 5 contains the state by state rankings for cause-specific rates per 1,000 person-years at-risk. The state with the highest ranking suicide rate per 1,000 person-years at-risk in 1978 was Wyoming (15.4 suicides per 1,000 person-years at-risk), with North Dakota

(12.26) and South Dakota (11.94) close behind. In the 1983 census, Wyoming and North Dakota were 41st (tied with Nevada and Idaho): these states reported no suicides in 1982. South Dakota dropped to fourth. Alaska, which along with Arkansas, Idaho, New Hampshire, and Utah, reported no suicides in 1978, was first is 1983, with over 28 suicides per 1,000 person-years at-risk.

//Table 5 About Here//

South Dakota reported the highest 1978 natural causes death rate per 1,000 person-years at-risk (8.96), a rate which was closely followed by New Mexico (7.62). Nevada (4.68), Montana (4.35), Kentucky (4.25) and Oklahoma (4.19) had only slightly lower rates. Once again, Montana, South Dakota and Nevada were not in the top fifteen in 1983. Kentucky remained in fifth position; and, Oklahoma dropped from sixth in 1978 to eleventh in 1983.

It is apparent that states experiencing the most radical shifts in rankings between censuses tended to be fairly small, urban states with lower total person-years at-risk (e.g., Wyoming, North Dakota, South Dakota, Montana, Oklahoma). The larger, in terms of total population and total person-years at-risk served, and more urbanized states exhibited considerably more consistency between censuses, irrespective of the cause of death (e.g., New Jersey, New York, Texas, Michigan and California), than the smaller more rural states. Consequently, the rankings reflected in Table 5 are influenced--- perhaps inordinately--- by the size of the state and the at-risk factor: Larger states may report numerically more deaths, but smaller states may report more deaths per capita for any fixed base. In order to control for this possible confounding factor, the actual number of cause-specific deaths is used as the dependent

variable of the analyses of variance and multiple classification analyses that follow, with the total person-years at-risk in a given state used as a covariate.

States and Death by Natural Causes

Analysis of variance (ANOVA) and multiple classification analysis (MCA) were ideally suited for the available data. The extra-institutional factors included in this segment of the analysis are primarily nominal in nature, and, as such are treated as main effects. These variables include the per capita (1000 inmates) expenditures on local corrections for each state (under $5,000, $5,001 to $9,999, $10,000 and over), region of the country (northeast, northcentral, south, and west), and whether or not the state correctional system was under a state or federal court-order in the year preceding the census. The covariates were limited to the following intra-institutional variables: full-time administrators, full-time custody staff, full-time professional staff, average percentage of unconvicted inmates in a state's jails, average jail stay statewide, average percentage of inmates held in a state's jails due to overcrowding in state or federal correctional facilities, the total person-years at-risk statewide, and, in only the case of the 1983 data, the total number of cause-specific deaths reported in the previous census.

The ANOVA provided insights as to which factors or main effects made significant contributions to the explained variance. The MCA, which employs a form of dummy-coding to allow us to understand the impact of the main effects, revealed both the unadjusted impact (eta) of the main effects (eta), the impact of the main effects adjusted for other main effects as well as the covariates (beta), and the total explained variance (R^2).

Table 6 contains the ANOVA for 1978 deaths by natural causes. All three main effects made significant contributions. In this instance, three of the covariates also contributed significantly to total variation. The statewide rate of full-time professional staff per 100 inmates (r = .318), average jail stay statewide (r = .141), and person-years at-risk for male jail inmates in a state (r = .). All three effects were significant beyond the .001 level.

//Table 6 About Here//

The MCA for 1978 deaths by natural causes is provided in Table 6 In all three cases, controlling for the other main effects resulted in increased direct effects (beta values). The explained variance for the main effects was a substantial 45.1 percent. Region of the country made the largest single contribution (*B* = .97); the south had the highest number of deaths by natural causes, followed in descending order by the west, northeast and northcentral. Jails spending the most money per capita (*B* = .68) had more deaths than jails spending lesser amounts; states *under court order* had more jail deaths than states not under court orders.

Entering the covariates into the MCA resulted in two major changes. First of all, the explained variance almost doubled, increasing from 45.1 percent to 79.7 percent. Second, only the impact of the court order main effect was unaffected by the covariates. The direct effects of both expenditures per capita and region decreased by one third. States expending the most money per capita still experienced the most deaths by natural causes, but the west replaced the northcentral as the region with the lowest number of deaths, a fact no doubt attributable to the larger number of person-years at-risk experienced by northcentral and

northeastern states. The southern states, which also enjoyed high person-years at-risk rates, remained the region of the nation with the most deaths.

As is evident from the ANOVA contained in Table 7, some rather startling changes in the factors related to deaths by natural causes had occurred by 1983. Only one of the main effects, region, made a significant contribution; nonetheless, the overall main effects contribution was also significant. And but one of the covariates, person-years at-risk for male jail inmates, made a similarly significant contribution, which also effected the overall impact of the covariates. The significance of the total explained variance was in excess of .001.

//Table 7 About Here//

The MCA analysis for 1983 deaths by natural causes (Table 7) provided some insights into these dramatic shifts. The impact of expenditures per capita and court order status were slight in 1983, especially when compared to 1978. Region continued to make the largest single contribution, with the south continuing to exhibit the largest number of deaths, followed, once again, by the west, northeast and northcentral. However, the impact of region on the explained variance, as adjusted for other main effects, was about one third less in 1983, and one quarter of its 1978 impact when adjustments were made for both the main effects and covariates. As further evidence of the declining impact of the extra-institutional factors, the total explained variance of the main effects was 8.3 percent in 1983, compared to 45.1 percent in 1978; the overall explained variance in 1983, to which only region and person-years at-risk made significant contributions, increased from 79.7 percent in 1978 to 88.6 percent.

What was in 1978 a problem linked to per capita expenditures, court orders, staffing patterns, average jail stay, regionality and person-years at-risk was related five and one-half years to only the latter two factors. We think this finding significant for the following reason: Those factors which no longer impacted on the statewide number of jail deaths due to natural causes were factors amenable to changes precipitated largely by court intervention. Region is problematic, but the variations in deaths reported by 1983 were much lower than those observed in 1978, a difference perhaps due to residual cultural as well as institutional differences (cf., Doerner, 1975, 1978; Gastril, 1971; Wright et al., 1983; Blau and Blau, 1982). Logically, we might anticipate that the more people a state processed through its jail system---*all things being equal*---the more deaths by natural causes that state will report. Simply put, a variation of this condition---*most things being equal*--- seems to have been more the case in 1983 than it was in 1978.

States and Suicide

In 1977, all three main effects made significant contributions to the number of suicides committed in a state's jail system (Table 8). However, among the covariates, only the total person-years at risk made a significant contribution. In spite of this fact, the total main effects, additive covariate effects and overall explained variance were all significant at or beyond the .001 level.

//Table 8 About Here//

The MCA for suicides in 1977 are summarized in Table 8. Collectively the three main effects variables accounted for 26.9 percent of the variance in number of suicides. The eta values and unadjusted deviations for expenditures and region suggest that these variables are

of only minor importance to incidence of suicides; however, the adjusted deviations and beta coefficients suggest that these variables have something of a suppressor effect on one another. As with deaths by natural causes, the number of suicides in a state increased as the per capita expenditures increased; the southern states reported the highest number of suicides, while northeastern states expressed the lowest incidence. States in which the prison system was under court order reported higher incidence of suicides than states in which there was no such state or federal court order.

Adjusting for the covariates resulted in a rather dramatic increase in the multiple R square value (74.5 percent *versus* 26.9 percent). Inclusion of the covariates in the MCA also resulted in lowered beta values for per capita expenditures (.54 *versus* .73) and region (.48 *versus* .74), while the direct effects of the court order variable were unaffected by the covariates. The patterns observed for the main effects were unchanged by the inclusion of the covariates: the greater the expenditures per capita, the great the incidence of suicides; the southern and northeastern states remained at opposite ends of the incidence level continuum, with northcentral and western states in between; states with prison systems under court order had significantly higher incidence of jail suicides involving male inmates than did states whose prison systems were not under court order.

As had been the case with death by natural causes, the patterns exhibited by the independent variables in 1978 and 1983 changed rather dramatically. But, as even a brief examination of the ANOVA contained in Table 9 reveals, there were some subtle differences as well. First of all, F value for the main effects was less significant in 1983 (p = .016)

than in 1978 ($p > .001$). In fact, not one of the main effects had a significant F value. Rather we suspect that since a nonorthogonal ANOVA design was employed, it is possible that with strongly associated individual factors, the additive effects as a whole may be significant while none of the individual effects are significant (Nie et al., 1975:406). The effects of region and court order approached but did not reach the .05 significance level. In the case of death by natural causes, only the effects of region achieved statistical significance. As for the covariates and total explained variance, once again the resultant F values are in excess of .001. By 1983, the incidence of suicide, much as had been the case for death by natural causes, was closely related to the sum of the person-years at-risk in a given state's jail system.

//Table 9 About Here//

In 1978, the main effects revealed significantly more about deaths by natural causes (45.1 percent) than suicides (26.9 percent). Five and one half years latter the main effects variables alone accounted for almost twice the explained variance for suicides (14.9 percent) as they did for deaths by natural causes (8.3 percent). Further, as clearly demonstrated in the MCA summarized in Table 9, adjusting for the covariates and independents increased the total explained variance for suicides to a level similar to that for death by natural causes. Furthermore, the direct effects of expenditures, region and court orders decreased at a rate which paralleled that observed in the MCA for death by natural causes. The direct effect of court order, a variable whose impact was nearly ($p = .08$) significant, was less than observed in 1978, but states with court orders continued to report more suicides than non-court order states. One unexpected development, given the pattern observed for deaths by natural causes, involved region. The F value for

region was, once again, nearly (p = .053) significant. However, the regional pattern was unlike any other thus far observed.

Once the adjustments for covariates were made, states in the six northeast states reported more suicides than any other region. It is also interesting to note that the northeast region reported the lowest incidence of suicides in 1978 and consistently reported lower than average numbers of death by natural causes in both 1978 and 1983. The south, which had shown equal consistency in reporting more deaths by natural causes in 1978 and 1983 and suicides in 1978 than any other region, was ranked second for suicides in 1983. Adjusting for the covariates little effected the court order variable. Most of the decrease in the direct effects of this variable occurred with the adjustments for the other independent variables. Once again, court-order states reported more suicides than non-court-order states. In sum, at the time of the 1983 census, the incidence of both suicide and death by natural causes was linked in almost identical fashion to regionality and the total person-years at-risk experienced by a state's jail inmate population. In the previous census, the incidence of both causes of death independent variables.

SUMMARY

With the glaring exception of suicide, death rates in American jails were considerably lower than rates experienced by either the general population or the equivalent population group. Initially, we attributed part of the lower than expected rates for jails as a whole and death by natural causes in particular to the fact that certain modes of death as either rare or unheard of in a jail context. Clearly, this generalization does not hold for homicides, the rate which exhibited the

greatest free society-jail population disparities. Some individuals, principally people whose age, race or ethnic background place them in a higher than average risk category, were statistically less likely to be murdered in custody than if they had been free on the streets. This finding does not necessarily mean that these individuals are "safer" in jail, as the rate of assaults, including those in which injuries are serious enough to eventually result in death (elsewhere), is largely unknown. Rather, homicide was a rare event in either census year; given the paucity of jail homicides, further analyses of homicide rates were deemed impractical.

All 1983 jail death rates were lower than those observed in the previous census. Jail suicides, however, did not decline at the same rate as jail-based general rates, homicide rates or death by natural causes rates. The divergence between suicide rates and the others is particularly obvious when the rates are based on person-years at-risk. The forces that seemingly brought about reductions in jail-based homicides and deaths by natural causes had less of an impact on suicides.

At the aggregate level, what initially appeared to be a straightforward question of which state had the highest per capita death rate was made more complex by the fact that there did not appear to be a pattern in the state rankings in either 1978 or 1983. Inter-census comparisons based on percapita rates showed that population poor states tended to exhibit greater variability than those for the more populous states. Herein lay a clue to a previously observed pattern: Deaths jails tended to be larger and more active than non-death jails. Since the number of people processed by jails was obviously a critical feature of the American jail death phenomenon, we opted to include it as an independent variable rather than have its impact be neutralized by

ranking the states by the death rates per 1,000 person-years at risk.

This approach proved to be highly advantageous. The person-years at-risk variable dominated the analyses in 1983. In 1978, certain extra- and intra-institutional factors played almost as significant a role in our understanding of the incidence of jail deaths as did the sum of the person-years at-risk. But by 1983 virtually all of the explained variance was made by the at-risk variable, with some assistance from region and, less often, the court order status of the state.

The statewide incidence of jail deaths in the early 1980's seemed closely linked to factors beyond the normal scope of administrative or legislative actions, principally the number of individuals placed at risk by reason of their residence in jail for some period of time. This contention limits the viable options open to state and local authorities. In fact, one of the only remaining ways to further reduce these rates is to employ restrictive arrest policies or to issue additional court orders to limit the size of jails, neither of which are likely to be met with much support by local law enforcement authorities nor public officials in general. And if the latter tact if adopted, conceivably more people may end up spending shorter periods of time in jail, as law enforcement and jail officials struggle to keep a supply of X arrestees in Y jail beds. Unless court orders are accompanied by changes in arrest and detainment policies, the net effect may be little real change in the total person-years at-risk.

PROBLEMS AND SOLUTIONS

The attainment of the research goals that guided this project was not without its setbacks and problems, the resolution of which may be seen by some as a series of "terminal errors" that severely limit the

usefulness of the findings. Perhaps this view is accurate. At the same time, these problems, to be summarized shortly, not only serve as benchmarks for those who would restrict the generalizability and validity of the findings, but may also guide others in the collection and analysis of data which would be entirely free of "terminal errors."

There were literally dozens of major problems encountered during the secondary analysis of the 1978 and 1983 Jail Census data. Generally speaking, these problems fell into one of four categories. The first category involved limitations imposed by instrumentation (i.e., alterations in the instruments used to collect the data). For example, homicide in 1978 was implicitly limited to the death of a jail inmate by injuries inflicted by another inmate. In 1983, this death category was expanded to homicides committed against inmates by individuals other than inmates (e.g., jail staff). Thus, the earlier homicide data, while not called homicide by name, was considered to be more conservative than the latter (1983) data. In any event, the paucity of homicides in either census, but especially in 1983, made all but the most rudimentary comparisons unmanageable and meaningless.

Other problems with instrumentation included but were not limited to the following: (1) changing the basis for collection of admissions and releases from weekly (1978) to yearly (1983), (2) providing more explicit categories for overcrowding data in 1983 than was the case in 1978, and (3) altering the basis for inclusion of full-time and part-time staff in the survey instrument from any and all staff (1978) to only those staff on the jail premises during the census day. Only the last instrumentation problem was truly problematic; our answer was to acknowledge this limitation in the affected segments of the

analysis and to include only full-time staff data---the group least likely to be effected by the change in instructions---in the aggregatized data analysis.

The second set of problems centered around shifting the time frame for the 1983 study from the calendar year of the earlier census to a fiscal year schedule. This change is problematic for two reasons, the second of greater importance than the first. That is, the difference between the two surveys is five and one-half years, whereas the difference between previous survey, conducted in 1972 and the next one, scheduled for 1988, is five years. Secondly, and more importantly, it is difficult to obtain certain census data for fiscal year schedules, especially death-related information. As a result it was necessary to use calendar year data.

Some readers may be concerned by the fact that much of the 1983 comparison data used in the segment of the analysis on rates calculations and some of the economic data in the aggregatized data analysis were not for the appropriate years. Specifically, the most recent cause-specific data available by age, sex and race were for 1980. The fact that these data did not dramatically change from 1977 will not deter the purists from questioning any comparisons made with these data. In any event, we were careful to note these problems during the analysis. And, many of the significant shifts in rates did not involve these comparisons. The expenditure data presents a more serious and less easily resolved problem. The necessary data were available for 1977. But the most recent data were for 1981, and they were published in mid-1985. Against the prospects of waiting until 1989 for *the most appropriate* data, we included the 1981 expenditures data in the aggregatized data analysis as "quasi-1982" per capita expenditure information.

Perhaps the most serious shortcoming is the lack of an unassailable measure of exposure to risk, or person-years at-risk. We employed a technique used to calculate the 11 day figure reported by the Bureau of Justice Statistics in its Bulletin entitled "Jail Inmates 1982". This method may "in the long run" be an accurate measure of the average stay, but in the small jail with little ingress and egress it may be terribly inflated. Again, while we would have preferred a specific measure of the average jail stay, a required statistic in the compilation of person-years at-risk, this particular method was employed since it provided an at least marginally defensible measure.

It would be an understatement to suggest that the National Jail Census data pose serious problems for the data analyst interested in jail conditions. For the reasons just cited the observations and conclusion contained in this paper remain our interpretations of the reality contained in what are at best "organizational outcomes" (Cicourel, 1968). It is also possible that the resultant errors severely limit the reliability and generalizability of the findings, which is one reason that I have so carefully documented each step in the various analyses. Whatever our concerns about the data, whose shortcomings and faults were legion before the present study added to the list, we should not lose sight of the fact that they remain our best picture of death and dying in American jails.

NOTES

[1]The number of deaths by all causes reported in American jails, unlike many jail events, including assaults by other inmates and guards or the denial of other basic civil rights, is probably a fairly accurate statistic. Cynics among us would contend, and perhaps not without some justification, that there may be strong inducements to classify some suicides and perhaps even some homicides as death by natural causes or locate certain deaths by natural causes as anywhere but the local jail. Since the late 1970s the number of "wrongful death suits" that have been filed in state and federal courts has mushroomed (Anderson, 1984; Fyfe, 1985a,b); the concomitant pressures to intentionally misclassify a "wrongful" jail death as the result of natural causes or victim-caused have no doubt likewise increased. As strong as the litigious-related inducements to alter these classifications may appear on the surface, the fact remains that in spite of a few well-publicized exceptions, the successful application of such suits --- and therefore the impetus to misclassify--- was relatively uncommon even in 1983. As far as the public relations problem is concerned, a jail death, even if the victim has not been convicted of a crime, is still only the death of a putative criminal, and as such unlikely to evoke public approbation unless the circumstances of that death are so heinous as to negate the victim's nonperson status (Goffman, 1961). In short, the overall cause-specific death statistics are probably as reliable and valid (or as unreliable and invalid) as any other currently available official crime statistics (Hagan, 1985:94-6; Nettler, 1984: Chapter 3). We adhere to the position advanced by Cicourel (1968). Crime statistics are social constructs. Crime rates and, by extension, jail death statistics, are produced

through the interaction of reporting behavior of jail officers, jail death classification policies, and the Bureau of the Census. Death statistics, however, are less open to manipulation than other "organizational outcomes" (McCleary et al., 1982; Sheley and Hanlon, 1978). Still, jail-based variations of the same questions that surround the compilation of crime statistics are relevant for these data (see Sheley, 1985:75-83). Certainly, they offer as representative a picture of death and dying in American jails as is currently available.

[2]Problems of intrumentation effected the quality of the homicide data. The 1978 census instrument asked for the number of inmates who died while confined in the facility as a result of "injury by another person;" in 1983, the phraseology had been changed to homicide and further included "homicide by other inmate" and "homicide-other". Between the two censuses, the Bureau of Justice Statistics received several inquiries about inmate homicides perpetrated by staff or other individuals besides inmates (Stephan, 1985). The changes in the wording of these questions were a response to this concern. Theoretically, the 1978 "homicide" statistics are more conservative than those collected in 1983.

[3]The Department of Health and Human Service's Mortality Reports include literally hundreds of different modes of death. most of which are by natural causes. In fact, the sum of all suicides, homicides and accidental deaths combined represent a relatively small fraction of deaths in the free society (U. S. Department of Health and Human Services, 1980, 1985; Bureau of the Census, 1979, 1980, 1983). Most deaths in America are due to natural causes, and most of these deaths are the result of "degenerative diseases" (e.g., cancer, heart-related diseases and disorders). At the risk of sounding redundant, many of

these causes are rarely if ever found in a jail setting or among jail inhabitants.

[4]Again a complication arose since publication of sex-race-age specific information in its most raw state is not generally available for up to five years after its collection. Given this limitation, both the general population rates and the general population equivalent group rates were calculated from 1977 and 1980 data, the latter representing the most recent sex-race-age specific mortality information available. The unavailability of directly comparable data leads, instead, to a comparison of the most recent jail death rates, compiled as they were for 1982, with non-jail death rates as reported for 1980. This shortcoming certainly opens up this segment of the analysis to questions concerning comparable data. However, the relative stability of the non-jail rates reported between 1977 and 1980 suggests that such criticisms may well be undeserved.

[5]The age specific requirement represented still another problem. Five and ten year intervals are included in the Reports. The five year interval data for the "low end" divisions are as follows: 15-19 and 20-24. It was felt that while 15, 16 and 17 year old youths are, in most jurisdictions, classified as adults, their inclusion in the population base and mortality figures more than offset the problems of excluding the 18 and 19 year old youths, who do constitute a large segment of the jail population. At the other end of the age spectrum, few jail inhabitants are 65 years of age and older; and, this group exhibits extremely high mortality rates, especially for natural causes.

[6]Changes in forms between 1978 and 1983 censuses pose still another challenge for those interested in staffing patterns. In 1978, information relative to all paid, full-time and part-time employees was collected. The 1983 forms specifically indicated that the Bureau was interested only in the number of paid, full-time and part-time employees on the premises as of the 24 hour period of the "census day". Thus, part-time and full-time employees that worked weekends or shift-work outside of the "census day" and those employees on vacation and sick leave were excluded. Comparisons between staffing patterns in 1978 and 1983 must be made with extreme caution since the raw data, especially in the case of part-time employees, have different time parameters. Of the two types of employees, the number of full-time employee of a jail is more immune from this problem than part-time, and as such, the segment of the analysis relying on employee data solely employs information for full-time staff.

[7]Although data were available for the District of Columbia was not considered at this stage in the analysis. In addition, five states were excluded from both censuses as they do not operate local correctional facilities, but had integrated jail-prison systems. These states were Connecticut, Delaware, Hawaii, Rhode Island, and Vermont.

[8]We were interested principally in the direct effects of the metric and nonmetric independent variables on the incidence of deaths by natural causes and suicides. Consequently, our analyses partition the additive effects of the factors into separate main effects by adjusting for all other effects, as well as revealing the saturated model. In addition, the significance of each metric variable or covariate is reported. Finally, in order to examine the relationships of factors to criterion variables, independent of each other and the other covariates, we also

reported the results of the appropriate Multiple Classification Analyses (MCA). Each MCA generated (1) adjusted deviations, or the means of each category expressed as deviations from the grand mean, (2) etas, which when squared indicated the proportion of the variations in the criterion variable explained by the factor, (3) adjusted deviations, or the means of each category expressed as deviations from the grand mean and adjusted for the influences of the other factors and/or covariates, (4) partial betas, or the direct effects of the factors after controlling for the other factors and/or covariates, and (5) the reported R^2 values, which represented the proportion of variation in each criterion variable explained by the additive effects of all factors and covariates.

[9]The general population death data are for 1980 and not 1982. However, to avoid confusion, the 1980 data will be referred to as 1982 general population death data. Similarly, the 1983 Jail Census reported on death for the fiscal year 1982-83, but will be discussed as 1982 jail death data.

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Table 1. General Mortality Rates in American Jails and the General Population: 1977, 1983

Population	Population Base[1]		Number of Deaths		Mortality Rate per 100,000	
	77	82	77	82	77	82
General Population[2]	216,330	226,556	1,899,597	1,989,841	878.1	878.3
General Population Equivalent[3]	70,262	71,869	382,382	449,551	656.3	638.7
Jail Population: All Inmates[4]	158.394	233.551	611	554	385.7	247.8
Jail Population: All Adult Males[5]	147.506	206.163	572	499	387.8	242.0
Jail Population: At-risk Adult Males[6]	226.251	242.670	572	499	252.8	205.6

[1]Population base figures expressed in thousands.

[2]Total estimated United States population in 1977 and 1980; total number of deaths reported in 1977 and 1980 for all causes.

[3]Age-sex-race-adjusted United States population in 1977 and 1980; total number of reported deaths in 1977 and 1980 from all causes, also age-sex-race adjusted; rates are weighted to reflect proportion of white adult males and other-race adult males in American jails.

[4]Total reported jail population in 1978 and 1983; total number of deaths reported in 1977 and 1982 for all causes.

[5]Adult male jail population in 1978 and 1983; total number of adult male deaths reported for 1977 and 1982 for all causes.

[6]Estimated adult male "person-years at-risk" jail population in 1978 and 1983; total number of adult male deaths reported for 1977 and 1982 for all causes; a total of 43 of the 1978 jails and 21 of the 1983 jails were excluded due to missing data.

Table 2. Suicide Rates in American Jails and the General Population: 1977, 1982

Population	Population Base[1]		Number of Suicides		Suicide Rate per 100,000	
	77	82	77	82	77	82
General Population[2]	216,330	226,556	28,772	26,960	13.3	11.9
General Population Equivalent[3]	70,262	71,869	17,258	16,763	22.6	21.7
Jail Population: All Inmates[4]	158.394	223.551	297	294	187.5	131.5
Jail Population: All Adult Inmates[5]	147.506	206.163	272	272	184.4	131.9
Jail Population: At-risk Adult Males[6]	226.251	242.670	272	272	120.2	112.1

[1]Population base figures expressed in thousands.
[2]Total estimated United States population in 1977 and 1980; total number of suicides reported in 1977 and 1980.
[3]Age-sex-race-adjusted United States population in 1977 and 1980; total number of reported suicides in 1977 and 1980, also age-sex-race adjusted; rates are weighted to reflect proportion of white adult males and other-race adult males in American jails.
[4]Total reported jail population in 1978 and 1983; total number of suicides reported in 1977 and 1982.
[5]Adult male jail population in 1978 and 1983; total number of adult male suicides reported for 1977 and 1982.
[6]Estimated adult male "person-years at-risk" jail population in 1978 and 1983; total number of adult male suicides reported for 1977 and 1982; a total of 43 of the 1978 jails and 21 of the 1983 jails were excluded from the analysis due to missing data.

Table 3. Homicide Rates in American Jails and the General Population: 1977, 1982

Population	Population Base[1]		Number of Homicides		Homicide Rate per 100,000	
	77	82	77	82	77	82
General Population[2]	216,330	226,556	19,402	24,241	9.2	10.7
General Population Equivalent[3]	70,262	71,869	14,047	17,407	45.5	51.9
Jail Population: All Inmates[4]	158.394	223.551	24	10	15.2	4.5
Jail Population: All Adult Males[5]	147.506	206.163	23	10	15.5	4.8
Jail Population: At-risk Adult Males[6]	226.251	242.670	23	10	10.2	4.1

[1]Population base figures expressed in thousands.
[2]Total estimated United States population in 1977 and 1980; total number of homicides reported in 1977 and 1980.
[3]Age-sex-race-adjusted United States population in 1977 and 1980; total number of reported homicides in 1977 and 1980, also age-sex-race adjusted; rates are weighted to reflect proportion of white adult males and other-race adult males in American jails.
[4]Total reported jail population in 1978 and 1983; total number of homicides reported in 1977 and 1982.
[5]Adult male jail population in 1978 and 1983; total number of adult male homicides reported for 1977 and 1982.
[6]Estimated adult male "person-years at-risk" jail population in 1978 and 1983; total number of adult male homicides reported for 1977 and 1982; a total of 43 of the 1978 jails and 21 of the 1983 jails were excluded from the analysis due to missing data.

Table 4. Natural Causes Mortality Rates in American Jails and the General Population: 1977, 1982

Population	Population Base[1]		Number of Deaths		Mortality Rate per 100,000	
	77	82	77	82	77	82
General Population[2]	216,330	226,556	1,601,100	1,713,100	740.6	751.7
General Population Equivalent[3]	70,262	71,869	293,827	286,582	494.6	490.2
Jail Population: All Inmates[4]	158.394	233.551	223	200	140.8	89.5
Jail Population: All Adult Males[5]	147.506	206.163	216	196	146.4	95.1
Jail Population: At-risk Adult Males[6]	226.251	242.670	216	196	95.5	80.8

[1]Population base figures expressed in thousands.
[2]Total estimated United States population in 1977 and 1980; total number of deaths reported in 1977 and 1980 for natural causes.
[3]Age-sex-race-adjusted United States population in 1977 and 1980; total number of reported deaths in 1977 and 1980 from all causes, also age-sex-race adjusted; rates are weighted to reflect proportion of white adult males and other-race adult males in American jails.
[4]Total reported jail population in 1978 and 1983; total number of deaths due to natural causes reported for 1977 and 1982.
[5]Adult male jail population in 1978 and 1983; total number of adult male deaths due to natural causes reported for 1977 and 1982.
[6]Estimated adult male "person-years at-risk" jail population in 1978 and 1983; total number of adult male deaths reported for 1977 and 1982 for natural causes; a total of 43 of the 1978 jails and 21 of the 1983 jails excluded due to missing data.

Table 5. Cause-specific Suicide and Death by Natural Causes Rates (per 1,000 person-years at-risk) for Male Jail Inmates (Rankings in Parentheses)

	Rates Per 1,000 Person-Years At-Risk			
	Suicide		Natural Causes	
State	1978	1983	1978	1983
Alabama	.86 (28)	1.97 (10)	1.29 (21)	.71 (23)
Alaska	.00 (41)	28.12 (1)	.00 (38)	.00 (35)
Arizona	3.45 (11)	1.69 (13)	.69 (29)	.00 (36)
Arkansas	.00 (41)	4.24 (3)	1.31 (20)	3.45 (1)
California	.64 (33)	.62 (37)	.35 (35)	1.15 (17)
Colorada	1.10 (24)	1.28 (21)	1.66 (13)	.38 (29)
Florida	.92 (27)	1.12 (24)	.84 (26)	1.44 (12)
Georgia	.57 (35)	1.05 (26)	.36 (34)	.83 (20)
Idaho	.00 (41)	.00 (41)	1.78 (12)	.00 (36)
Illinois	.86 (28)	.71 (34)	.43 (33)	.12 (34)
Indiana	3.46 (10)	2.88 (6)	1.04 (24)	1.54 (10)
Iowa	5.06 (7)	1.10 (25)	.00 (38)	.00 (36)
Kansas	.91 (26)	.73 (32)	2.74 (9)	1.64 (8)
Kentucky	3.09 (13)	2.90 (5)	4.25 (5)	2.34 (5)
Louisiana	.81 (30)	1.13 (23)	1.05 (22)	.75 (22)
Maine	5.15 (6)	1.59 (18)	.00 (38)	1.89 (6)
Maryland	.52 (36)	.62 (37)	.17 (37)	.46 (26)
Massachusetts	.48 (37)	1.67 (16)	.00 (38)	.30 (32)
Michigan	1.88 (20)	.38 (40)	.72 (28)	.57 (24)
Minnesota	2.75 (15)	1.75 (12)	.55 (30)	1.09 (18)
Mississippi	.62 (34)	.77 (31)	1.55 (15)	.42 (27)
Missouri	1.08 (25)	.90 (29)	1.35 (19)	.57 (24)
Montana	4.35 (9)	4.73 (2)	4.35 (4)	.00 (0)

Table 5. (Continued) Cause-specific Suicide and Death by Natural Causes Rates (per 1,000 person-years at-risk) for Male Jail Inmates (Rankings in Parentheses)

	Rate Per 1,000 Person-Years At-risk			
	Suicide		Natural Causes	
State	1978	1983	1978	1983
Nebraska	3.44 (12)	1.04 (26)	1.72 (10)	2.59 (4)
Nevada	2.81 (14)	.00 (41)	4.68 (3)	1.20 (16)
New Hampshire	.00 (41)	1.82 (11)	.00 (38)	.00 (36)
New Jersey	.67 (32)	.70 (35)	.50 (31)	.36 (30)
New Mexico	9.68 (4)	1.56 (19)	7.26 (2)	1.59 (9)
New York	.46 (39)	.46 (39)	.32 (36)	.40 (28)
North Carolina	2.74 (16)	1.01 (28)	3.42 (7)	1.83 (7)
North Dakota	12.26 (2)	.00 (41)	.00 (38)	.00 (36)
Ohio	2.70 (17)	1.56 (19)	1.42 (18)	1.23 (15)
Oklahoma	5.23 (5)	2.83 (7)	4.19 (6)	1.51 (11)
Oregon	.47 (38)	1.69 (13)	.00 (38)	.00 (36)
Pennsylvania	.38 (40)	1.69 (13)	1.05 (22)	.83 (20)
South Carolina	1.22 (22)	.68 (36)	.91 (25)	2.74 (3)
South Dakota	11.94 (3)	3.16 (4)	8.96 (1)	.00 (36)
Tennessee	.71 (31)	1.65 (17)	1.43 (17)	1.25 (14)
Texas	1.66 (21)	1.27 (22)	1.66 (13)	1.27 (13)
Utah	.00 (41)	3.09 (5)	1.44 (16)	.00 (36)
Virginia	2.05 (19)	.72 (33)	1.71 (11)	.96 (19)
Washington	2.57 (18)	.81 (30)	.74 (27)	.29 (33)
West Virginia	4.85 (8)	2.50 (8)	3.23 (8)	3.11 (2)
Wisconsin	1.33 (22)	2.25 (9)	.44 (32)	.36 (30)
Wyoming	15.40 (1)	.00 (9)	.00 (38)	.00 (36)

Table 6. Analysis of Variance: Incidence of Death by Natural Causes by State in 1978

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Main Effects	429.11	6	71.52	11.48	>.001
EXPENPERCAP78[1]	162.61	2	81.31	13.06	>.001
REGION[2]	345.09	3	115.03	18.47	>.001
COURTORDER78[3]	34.42	1	34.42	5.53	.025
Covariates	328.64	7	46.95	7.54	>.001
FTADMIN78[4]	1.19	1	1.19	.19	.67
FTCUSTODY78[5]	14.72	1	14.72	2.36	.13
FTPROF78[6]	45.98	1	45.98	7.38	.011
RATENOCONVCT78[7]	.01	1	.01	<.01	.96
AVGSTAY78[8]	27.45	1	27.45	4.41	.044
OVERCROWD78[9]	.70	1	.70	.11	.74
MALEPOP78[10]	144.63	1	144.63	23.23	>.001
Explained	757.75	13	58.29	9.36	>.001
Residual	193.05	31	6.23		
Total	950.80	44	21.61		

Table 6. (Continued) Analysis of Variance: Incidence of Death by Natural Causes by State

Multiple Classification Analysis

Grand Mean = 4.73

Variable and Attributes	N	Unadjusted Dev'n	Eta	Adjusted for Independents Dev'n	Beta	Adjusted for Independents & Covariates Dev'n	Beta
EXPENPERCAP78			.21		.68		.41
Under 5,000	12	1.10		-5.15		-3.00	
5,001-9,999	16	.45		1.49		1.64	
Over 10,000	17	-1.20		2.23		.57	
REGION			.52		.97		.67
Northeast	6	-1.23		-3.25		-.62	
Northcentral	12	-1.73		-3.46		-2.22	
South	15	3.40		6.29		4.23	
West	12	-1.90		-2.78		-2.76	
COURTORDER78			.25		.22		.22
No court order	38	-.50		-.42		-.43	
Under court order	7	2.70		2.30		2.35	
Multiple R Squared					.451		.797
Multiple R					.672		.892

[1]1978 State-wide corrections expenditures per 1000 inmates.
[2]Regions of the nation.
[3]State or Federal Court order for state prisons as of 1977.
[4]State-wide rate of full-time administrators per 100 inmates.
[5]State-wide rate of full-time custody staff per 100 inmates.
[6]State-wide rate of professional staff per 100 inmates.
[7]Average statewide percentage of unconvicted jail inmates.
[8]Average statewide percentage of jail inmates held due to overcrowding in state or federal correctional institutions.
[9]Statewide average jail stay in days.
[10]Statewide total person-years at-risk.

Table 7. Analysis of Variance: Incidence of Death by Natural Causes in 1983 by State

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Main Effects	192.36	6	32.06	3.66	.008
EXPENPERCAP83[1]	40.14	2	20.07	2.29	.12
REGION[2]	157.77	3	52.59	5.99	.002
COURTORDER83[3]	2.77	1	2.77	.32	.578
Covariates	1858.28	8	232.29	26.49	>.001
FTADMIN83[4]	6.94	1	6.94	.79	.38
FTCUSTODY83[5]	.29	1	.29	.03	.86
FTPROF83[6]	11.89	1	11.89	1.36	.25
RATENOCONVCT83[7]	.28	1	.28	.03	.86
AVGSTAY83[8]	14.54	1	14.54	1.66	.21
OVERCROWD83[9]	7.78	1	7.78	.89	.35
MALEPOP83[10]	637.58	1	637.58	72.73	>.001
SUICIDES78[11]	.74	1	.74	.08	.77
Explained	2050.64	14	146.47	16.71	>.001
Residual	263.01	30	8.77		
Total	2313.64	44	52.58		

Table 7 (Continued) Analysis of Variance: Incidence of Death by Natural Causes in 1983 by State (N=45)

Multiple Classification Analysis

Grand Mean = 4.31

Variable and Attributes	N	Unadjusted Dev'n	Eta	Adjusted for Independents Dev'n	Beta	Adjusted for Independents & Covariates Dev'n	Beta
EXPENPERCAP83			.10		.18		.07
Under 5,000	13	.92		-1.42		.70	
5,001-9,999	17	-.78		-.42		-.01	
Over 10,000	15	.09		1.71		-.59	
REGION			.26		.37		.17
Northeast	6	-1.31		-1.76		-1.45	
Northcentral	12	-2.06		-2.26		-.83	
South	15	2.42		3.70		1.74	
West	12	-.31		-1.49		-.61	
COURTORDER83			.09		.04		.07
No court order	27	-.53		.23		.44	
Under court order	18	.80		-.35		-.65	
Multiple R Squared					.083		.886
Multiple R					.288		.941

[1]1983 State-wide corrections expenditures per 1000 inmates.
[2]Regions of the nation.
[3]State or Federal Court order for state prisons as of 1983.
[4]State-wide rate of full-time administrators per 100 inmates.
[5]State-wide rate of full-time custody staff per 100 inmates.
[6]State-wide rate of professional staff per 100 inmates.
[7]Average statewide percentage of unconvicted jail inmates.
[8]Average statewide percentage of jail inmates held due to overcrowding in state or federal correctional institutions.
[9]Statewide average jail stay in days.
[10]Statewide total person-years at-risk.
[11]Total number of deaths by natural causes in the state reported in 1978.

Table 8. Analysis of Variance: Incidence of Suicide in 1977 by State (N = 45)

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Main Effects	352.34	6	58.72	5.46	.001
EXPENPERCAP78[1]	249.04	2	124.52	11.58	>.001
REGION[2]	240.99	3	96.99	9.02	>.001
COURTORDER78[3]	54.96	1	54.96	5.11	.031
Covariates	622.24	7	88.89	8.27	>.001
FTADMIN78[4]	10.65	1	10.65	.99	.33
FTCUSTODY78[5]	1.50	1	1.50	.14	.71
FTPROF78[6]	16.33	1	16.33	1.52	.23
RATENDCONVCT78[7]	2.63	1	2.63	.24	.62
AVGSTAY78[8]	16.33	1	16.33	1.52	.23
OVERCROWD78[9]	.24	1	.24	.02	.88
MALEPOP78[10]	274.78	1	274.78	25.55	>.001
Explained	974.58	13	74.97	6.97	>.001
Residual	333.34	31	10.75		
Total	1307.91	44	29.73		

Table 8. (Continued) Analysis of Variance: Incidence of Suicides in 1978 by State (N=45)

Multiple Classification Analysis

Grand Mean = 6.04

Variable and Attributes	N	Unadjusted Dev'n	Eta	Adjusted for Independents Dev'n	Beta	Adjusted for Independents & Covariates Dev'n	Beta
EXPENPERCAP78			.08		.73		.54
Under 5,000	12	-.54		-6.24		-4.79	
5,001-9,999	16	-.11		-.82		1.59	
Over 10,000	17	.48		3.63		1.89	
REGION			.27		.74		.48
Northeast	6	-2.38		-5.11		-4.03	
Northcentral	12	.21		-2.01		-.29	
South	15	1.69		5.43		3.27	
West	12	-1.13		-2.23		-1.78	
COURTORDER78			.16		.23		.23
No court order	38	-.36		-.54		-.53	
Under court order	7	1.96		2.91		2.88	
Multiple R Squared					.269		.745
Multiple R					.519		.863

[1]State-wide corrections expenditures per 1000 inmates.
[2]Regions of the nation.
[3]State or Federal Court order for state prisons as of 1977.
[4]State-wide rate of full-time administrators per 100 inmates.
[5]State-wide rate of full-time custody staff per 100 inmates.
[6]State-wide rate of professional staff per 100 inmates.
[7]Average statewide percentage of unconvicted jail inmates.
[8]Average statewide percentage of jail inmates held due to overcrowding in state or federal correctional institutions.
[9]Statewide average jail stay in days.
[10]Statewide total person-years at-risk.

Table 9. Analysis of Variance: Incidence of Suicide in 1983 by State

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Main Effects	237.69	6	39.62	3.17	.016
EXPENPERCAP83[1]	21.19	2	10.60	.89	.44
REGION[2]	107.29	3	35.76	2.87	.053
COURTORDER83[3]	40.94	1	40.94	3.28	.080
Covariates	977.91	8	122.24	9.79	<.001
FTADMIN83[4]	.07	1	.07	<.01	.94
FTCUSTODY83[5]	1.68	1	1.68	.13	.72
FTPROF83[6]	.00	1	.00	.00	.99
RATENOCONVCT83[7]	.02	1	.02	<.01	.97
AVGSTAY83[8]	1.59	1	1.59	.13	.72
OVERCROWD83[9]	.15	1	.15	.01	.91
MALEPOP83[10]	179.45	1	179.45	14.38	.001
SUICIDES78[11]	11.62	1	11.62	.93	.34
Explained	1215.61	14	86.83	6.96	<.001
Residual	374.39	30	12.48		
Total	1590.00	44	36.14		

Table 9. (Continued) Analysis of Variance: Incidence of Suicides in 1983 by State (N=45)

Multiple Classication Analysis

Grand Mean = 6.00

Variable and Attributes	N	Unadjusted Dev'n	Eta	Adjusted for Independents Dev'n	Beta	Adjusted for Independents & Covariates Dev'n	Beta
EXPENPERCAP83			.15		.16		.04
Under 5,000	13	1.38		-1.01		.28	
5,001-9,999	16	-.65		-.32		.07	
Over 10,000	15	-.47		1.25		-.33	
REGION			.33		.35		.17
Northeast	6	1.17		1.46		1.78	
Northcentral	12	-1.67		-1.40		-.52	
South	15	2.40		2.44		.65	
West	12	-1.92		-2.38		-1.18	
COURTORDER83			.27		.18		.14
No court order	27	-1.33		-.89		-.68	
Under court order	18	2.00		1.34		1.03	
Multiple R Squared					.149		.765
Multiple R					.387		.874

[1]1983 State-wide corrections expenditures per 1000 inmates.
[2]Regions of the nation.
[3]State or Federal Court order for state prisons as of 1983.
[4]State-wide rate of full-time administrators per 100 inmates.
[5]State-wide rate of full-time custody staff per 100 inmates.
[6]State-wide rate of professional staff per 100 inmates.
[7]Average statewide percentage of unconvicted jail inmates.
[8]Average statewide percentage of jail inmates held due to overcrowding in state or federal correctional institutions.
[9]Statewide average jail stay in days.
[10]Statewide total person-years at-risk.
[11]Total number of suicides in the state reported in 1978.