

DEMOGRAPHIC AND CRIMINAL DETERMINANTS OF MORTALITY IN PRISON: THE ODDS OF SURVIVING CONFINEMENT

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Abstract

Several studies have demonstrated the importance of sociodemographic factors on prison mortality. This study advances our understanding of mortality by expanding demographic models to include habitual offenders, primary offenses and sentence length. Using data from the Florida Department of Corrections, this article explores the relationship between demographic and criminal characteristics of inmates and the odds of surviving confinement. Results indicate that criminal characteristics of inmates and medical status more strongly affect the probability of surviving confinement than race and sex. Finally, there was no indication of confounding and interaction effects with the exceptions of a two-way interaction of good health and race, good health and prison offense, and prison offense and sentence length.

INTRODUCTION

The population and deaths in United States prisons have become notably more striking over the past two decades. Official statistics show that the actual number of deaths increased considerably over the years (Maguire and Pastore, 1997; Beck, 2000). Rising population combined with changes in the sentencing laws and the high risk of HIV/AIDS has resulted in an increase in mortality. Florida prisons' mortality increase has been rather striking. In Florida for example, actual observed deaths increased from 60 in 1984 to 174 in 1993. The proportion of deaths grew by about 190% for the 9-year period. Crude death rates increased from 2.2 per 1,000 in 1984 to 3.3 per 1,000 in 1993 (Florida Department of Corrections Annual Reports, 1984 to 1999). Other studies show that not only is mortality on the increase in U.S. prisons but also most of the deaths are AIDS-related (Hammett, Harmon, Maruschak, 1999; Amankwaa, 1995; Harlow, 1993). Yet, little is known about the precise nature of the determinants of mortality in prison. Studies of the determinants of mortality in the general population often seek to measure the impact of socioeconomic and demographic factors on mortality. Substantial insights can be gained if, in addition to the socioeconomic and demographic factors, offense type of inmates are examined.

This article explores a neglected topic in criminal justice and demographic literature: the link between mortality and inmate characteristics. Specifically, we examine the odds of an inmate dying in prison given demographic, criminal characteristics and medical status of

inmates at the time of incarceration. The question is do offense type influences inmates mortality risks in prison? To answer this question, we evaluate the probability of surviving confinement using bivariate and multivariate analyses. The data for the study are drawn from detailed records of inmates in the Florida Department of Corrections, and include all releases in 1997-98 fiscal year.

Given the unavailability of medical variables, such as diagnosis and cause of death in the data set, which are very important in analyzing determinants of mortality, this article does not address causes of death. Whether or not an inmate died from AIDS, cancer or cardiovascular disease is beyond the scope of this article and thus will not be examined.

CONCEPTUAL FRAMEWORK: FACTORS LINKING OFFENSE TYPE AND MORTALITY

Based on previous findings, we expect that crime record is associated with mortality risks. In this section we outline some of the mechanisms that might produce this relationship.

Criminologist have investigated the relationship between offense type and sentencing policies (Cullen, Bynum, Garrett and Greene, 1985; McGarrell and Flanagan, 1987), including the effects of three strikes and you're out laws on the age structure of the prison population (Schmertmann, Amankwaa and Long, 1998). Much research suggests that the prison populations constitute different types of felony offenses which include, but are not limited to, murder, forcible rape, burglary, larceny, theft and arson. Moreover, and perhaps very important for health reasons, inmates are particularly

prone to different health risks because of overcrowding (Koehler, 1994; Woods, Harris and Solomon, 1997). For example, inmates who sever longer in prison are more likely to have higher mortality associated with degenerative diseases. However, those who are incarcerated for shorter durations are also at risk of communicable and other infectious diseases such as HIV/AIDS and Tuberculosis (TB) (Koehler, 1994; Woods, Harris and Solomon, 1997).

Furthermore, given the prevalence of HIV/AIDS and other infectious and degenerative diseases in the U.S. prison system (Amankwaa, 1995; Hammett, Harmon and Maruschak, 1999), inmates tend to be more at risk than the general population because of institutionalization. Fortunately, our data allows control not only of time served but also primary and habitual offenses. Consequently, we can estimate the impact of time served on mortality. Thus, there are multiple reasons to expect offense type to be associated with higher mortality.

MEDICAL STATUS AND MORTALITY

Previous studies have suggested that the risk of surviving confinement varies by medical status. It has been argued that the structure of mortality in a population is determined not by the differences in fatality rates but by the incidence and prevalence of various diseases (United Nations, 1982). In fact, the association between medical status and mortality may be influenced by the environment in which the population lives. Nevertheless, medical status may be related to several factors, which we cannot measure, that may work to increase the risk of mortality. Some of these include how disease is perceived within the prison system. Within the prison setting, diseases that are regarded as a gradual deterioration in health status or are infectious in nature (HIV/AIDS and TB), which must be prevented, is given immediate attention (Hammett, Harmon and Maruschak, 1999). Furthermore, inmates whose diseases are perceived to be less threatening often face health hassles that have the potential to result in the loss of health benefits due to lack of or improper medical attention (Engle, 1999). Other factors involve problems of discouraging high risk sexual activity in prisons (Amankwaa, Amankwaa and Ochie, 1999).

SOCIDEMOGRAPHIC FACTORS AND MORTALITY

People who commit crimes may differ de-

mographically from the general population. Much research suggests that people who commit crimes, on average, are young, black or Hispanic persons, not white (Hussey and Elo, 1997; Rogers, 1995; Kallan, 1997). Much research suggests that age, ethnicity, and sex are associated with mortality. Because these demographic characteristics are also related to the risks of mortality we controlled for them in our models.

Another important factor associated with mortality is socioeconomic status. For example, inmates who are more educated may be more likely to engage in healthy behaviors and have lower mortality rates. Thus, an observed association between an inmates healthier life styles and mortality may, in fact be due to socioeconomic characteristics. Indeed, our data set allows control for the education of inmates. As a result we can directly assess the impact of education on mortality.

PREVIOUS RESEARCH FINDINGS

Socioeconomic and demographic variables are unquestionably important in predicting mortality. It is well documented that socioeconomic status is an important predictor of a person's health and mortality (Kallan, 1997; Feinstein, 1993; Preston and Taubman, 1994; Williams and Collins, 1995; Hummer, Rogers and Eberstein 1998; Rogers, 1995). Previous studies suggest that individuals with high income and education enjoy the benefits of longer and healthier life (Feinstein, 1993; Preston and Taubman, 1994; Williams and Collins, 1995; Hummer, Rogers and Eberstein 1998). The healthier an individual, the lower their mortality risk. Furthermore, some research indicates that race, age, and marital status influence a person's risk of dying (Hussey and Elo, 1997; Rogers, 1995; Kallan, 1997).

A number of variables have been identified in the research literature as important correlates of mortality. For example, income and education have been found to have a remarkable moderating effect on the risk of dying (Smith, Shipley and Rose, 1990; Potter, 1991; McCord and Freeman, 1990; Elo and Preston, 1996, 1997; Hummer, Rogers and Eberstein, 1998; Johnson et al, 1999) with various explanations for the differences. Furthermore, Johnson and colleagues (1999), using U.S. longitudinal data of persons aged 25-64, concluded that mortality differences exist for se-

lected specific occupations beyond those explained by social status, income and education. Overall Doornbus and Kromhout (1991) found that there is a more persistent pattern of mortality differentials by education.

A larger literature investigates the effects of educational inequalities, sex, and race on adult mortality (Christenson and Johnson, 1995). Using Michigan's 1989-1991 death certificates, in conjunction with the 1990 Census data, Christenson and Johnson demonstrated that variations in education status differ by sex and race across the adult life cycle. In addition, the research shows that the relative differences in mortality rates between educational levels decline with age across sex and race categories.

Age has been one of the long-standing variables of interest in analyzing adult mortality. Following the initial work by Gompertz, Olshansky and Carnes (1997), mathematical models show that the very young and the old have the highest death rates. Although these mathematical models are interesting, they do not adequately capture the actual variability in the human experience with death. Recently, researchers have developed genetic models of human frailty that attempt to combine demographic analysis with quantitative genetics and epidemiology (Weiss, 1990; Yashin and Iachine, 1997).

Other studies, however, have focused on the general linkage between marriage and the risk of mortality. One very important finding in demography is that married individuals' mortality rates are lower than those who are unmarried. In both developed and developing countries there is evidence to indicate the beneficial effects of marriage on mortality (Hu and Goldman, 1990; Rahman, 1993).

Most of the past work has focused on gaining an understanding of the determinants of mortality in the general population. Thus (understandably) there is little or no literature on the association between criminal characteristics and mortality. Although offense type may be relevant in understanding criminal behavior, it is possible that offense types vary significantly within the prison population. In the context of mortality research, inmates incarcerated with violent offenses are more likely to serve longer sentences. Intraprison disparities of offense types therefore might lead to differences in mortality risks between violent

and nonviolent offenses unless the length of sentence is held constant.

Hammett, Harmon and Maruschak (1999) use data on prisoners from the Centers for Disease Control and Prevention, National Prisoner Statistics and Bureau of Justice Statistics to examine AIDS-related mortality. Hammett, Harmon and Maruschak (1999) find AIDS a significant cause of death in prison. Their analysis, however, gives no attention to the determinants of mortality in prison. Amankwaa (1995) used data from the Florida Department of Corrections to examine causes of death. His research shows that AIDS is the major cause of death in the Florida prison system. Similar results were found among male prisoners in Maryland (Salive, Smith and Brewer, 1990). None of these studies sought to examine the effect of offense type on mortality. In short how the combined effect of demographic, offense type and medical status of inmates affect the chances (log odds) of surviving incarceration remains an issue to be explored.

DATA AND MEASURES

The data for the analysis came from the Florida Department of Corrections. In our analysis we used the data set containing all releases for the fiscal year 1997-98. Using the release data file for this analysis is deemed appropriate since death, a demographic outcome, is considered an exit from prison. For this very reason any inmate who died in prison is regarded as unable to survive confinement, while any offender who served his or her time successfully survives confinement. The present analysis is based on a total population of 24,490 inmates released, of which there were 225 deaths excluding all executions.

Information on the exact causes of death is not available on the inmate release data files. Consequently, this analysis uses information on the medical status¹ of the inmate as proxy for physical conditions. The measure of medical grade¹ is an indication of the severity or otherwise of the inmate's health conditions.

In this analysis we created a variable, survive confinement, from the release data set. The variable survive confinement is in a binary form categorized into whether the inmate died (i.e., unable to survive confinement) or survives confinement (i.e., inmate was released for other reasons). Such a measure is more feasible to interpret. For the logistic regression model, a

dependent variable is expressed in a binary form. Once incarcerated one can only exit after completion of sentence (including control release) or death.

The independent variables used in our model, as shown in Table 1, are sex, race, educational level tested², age at release, sentence length, primary offense³, habitual offenders and medical status. Race/ethnicity have been hypothesized to be an important predictor of mortality (Elo & Preston, 1996). Race is treated as categorical variable with blacks, Hispanics, and other, coded as 0 and white coded as 1. Sex in this analysis is a dichotomous dummy variable: coded 0 equals female and 1 equals male. Our demographic controls are age and years of education. The average age of an inmate at the time of release is 33 years with a standard deviation of 9.53 indicating some dispersion. Education is measured in single years with the average years of education 7.16.

Our criminal measures include habitual offenders, primary offense³ (categorized into violent and nonviolent offenders) and sentence

length. Inmates who commit violent crimes, in general, are given longer sentences. The average time served is 452 months with a standard deviation of 67.64 indicating that there is a greater variability in the time served. These criminal characteristics of inmates may affect their likelihood of dying in prison. For example, the policy of mandatory sentences may affect survival chances directly, simply by preventing the offender from getting out earlier.

The data also include detailed information about the medical status of inmates. We classified medical status of the inmate in four ways: 1) no organic diseases, 2) minimum organic diseases, 3) moderate organic diseases and 4) severe organic diseases may affect whether or not an inmate will die in prison. Consequently, this analysis uses information on the medical status of the inmate as a proxy for physical conditions at time of release. The measure of medical grade is an indication of the severity or otherwise of the inmate's health conditions.



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