

Original research
**Suicide behind the wall: A national analysis of corrections officer
suicide**

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Abstract: There is little research on suicide among corrections personnel. The present study examined age-adjusted proportionate mortality ratios (PMRs) for suicide among corrections personnel compared to the U. S. working population in 23 states during 1999, 2003-2004, and 2007, based on the National Occupational Mortality Surveillance database (NOMS). Age adjusted PMRs for total and white male corrections personnel suicides were significantly elevated (PMR=141, 95% CI=111-178 and PMR=134, 95% CI=102-173 respectively). White corrections female PMRs were nearly double those of U.S. female workers (PMR=199, 95% CI=91-377), although a small number. Overall, corrections personnel have a significantly higher age-adjusted risk for suicide. Ratios were particularly high among females. Additional study is needed on potential precipitants and occupational risk factors associated with suicide among corrections personnel.

Keywords: *corrections personnel, suicide, law enforcement, gender, race, epidemiology*

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As mandated by their occupation, corrections officers spend a good part of their day within the walls of correctional facilities. There is considerable responsibility associated with this occupation. Officers must keep vigilance over inmates and often unpredictable behaviors such as violence against officers and other inmates, forging hand-made weapons, attempts at escape and suicide attempts (Hill, 1982). There is also the danger of disease transmission from inmates such as HIV with the estimated overall rate of AIDS among prison inmates at more than 2.5 times the rate in the United States general population (Maruschak, 2006).

Under such work conditions, it is likely that corrections personnel experience chronic stress. A study of five jails found that correctional officers

self-reported high levels of stress (Stohr et al., 1994). Corrections stress has been associated with poor training and high turnover rates which limited long term peer group cohesiveness (Philliber, 1987). National research indicates that corrections officers are among the most dissatisfied workers in the labor force (Cullen, et al, 1998). Other stress factors include high work demands coupled with low control, administrative stress, shift work, longer contact hours with inmates, job dissatisfaction, dangerousness, fear of legal liability, and low social support (Dowden & Tellier, 2004). Cheek and Miller (1983) found that the average rates of divorce and stress related illnesses (i.e., heart disease, hypertension, and ulcers) for corrections officers were high, while another study reported that the average life span of corrections officers was sixteen years lower than the national average (Cheek, 1984). According to Dowden and Tellier (2004), of the problems facing corrections officers, the perceived dangerousness of the position was the most stressful.

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In addition to chronic work stress, corrections officers may be at increased risk for posttraumatic stress disorder (PTSD). A study by Spinaris, Denhof and Kellaway (2012) found an overall prevalence rate of 27% for PTSD symptoms experienced among corrections officers over the past 30 days. Officers who reported high PTSD symptoms reported significantly more exposure to workplace violence, injury and death, higher levels of depression, anxiety, and stress, more absenteeism, and less life satisfaction.

Corrections work stress can spill over onto family relationships. A study by the Correctional Management Institute of Texas at Sam Houston State University (2014) of 441 correctional officers found that the demands and tensions from work negatively impacted their home life. Hepner (2005) commented that the corrections environment contributed to dysfunction in the officer's personal lives and relationships. Obidoa, Reeves, Warren, Reisine and Cherniack (2011) found an association between correction officer depression and family conflicts. Black (1982) reported that correctional officers tended to displace work frustration onto family members.

Despite previous evidence of inordinate stress, posttraumatic stress, and family relationship disruption among correction officers, there is a paucity of suicide research on this occupational group. The majority of research on suicide within corrections institutions is based on prevention of inmate suicides (Stack & Tsoudis, 1997; Lester, 1993; Liebling, 1993). To our knowledge, only two studies have empirically examined suicide rates *specifically focused* on corrections officers. Stack and Tsoudis (1997) analyzed suicide data from 21 states which reported occupational data on the deceased in the 1990 National Mortality Detail File. 7.14% of the officers died of suicide in 1990 compared to 4.51% of the general working age population. Controlling for the other demographic variables, correctional officers were 39% more at risk of death from suicide (vs. natural causes) than non-correctional officers.

The New Jersey Police Suicide Task Force (2009) noted that New Jersey corrections officers committed suicide at over double the rates of police officers and the general New Jersey population. There were fifty five suicides among this population between 2003-2007. Of these, sixteen (30%) were corrections officers. For males ages 25-64, suicide rates were as follows; 34.8/100,000 for corrections, 15.1/100,000 for police, and 14/100,000 for the general population. Access to lethal means (firearm) was a prominent factor, as officers were far more likely to be

committed with a firearm than suicides among similarly aged males.

This study was part of a larger study on suicide on law enforcement (see Violanti, Robinson & Chen, 2013) and examines corrections staff suicide on a national level during 1999, 2003-2004, 2007. Data is based on the National Occupational Mortality Surveillance system (NOMS), maintained by the Center for Disease Control and Prevention's National Institute for Occupational Safety and Health (CDC/NIOSH) which contains cause of death data for workers by occupation and industry. Corrections officer deaths were evaluated to determine whether suicide risk was elevated compared the general U.S. working population.

Method

Death certificate data for 1.46 million decedents were contributed by 23 U.S. states to the National Occupational Mortality Surveillance System (NOMS) maintained by the National Institute of Occupational Safety and Health (<http://www.cdc.gov/niosh/topics/surveillance/NO MS/>.) Last accessed October 28, 2013). Reporting states were Colorado, Georgia, Idaho, Hawaii, Indiana, Kansas, Kentucky, Michigan, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Ohio, Rhode Island, South Carolina, Texas, Utah, Vermont, Washington, West Virginia, and Wisconsin.

Identification of Deaths

After edits of the data and elimination of the unemployed or those with no reported occupation or industry, all deaths aged 18-90 years due to suicide (intentional self-harm, ICD-10 codes X60-X84, Y870) were identified from the study population and used to create analysis files that include age, sex, race, underlying cause of death, and usual occupation. Law enforcement occupations of interest were specified as "correctional officers" (2000 Census codes 370,380 and 1990 Census codes 415,424). The comparison population was deaths in all occupations.

Analysis: Proportionate Mortality Ratios (PMR)

Proportionate mortality ratio analysis based on the underlying cause of death was used to evaluate the suicide patterns by occupation and industry and included race- sex- specific age-adjusted PMRs were calculated for Caucasian, African-American, and Hispanic persons. PMRs are calculated by comparing the proportion of deaths from a specified cause within a specified occupation or industry group with the proportion of deaths due to that cause among the comparison population,

age-adjusted after stratification on race (Caucasian and African-American).

Proportionate mortality ratio analysis based on the underlying cause of death was used to evaluate the suicide patterns by occupation and industry. Race-, sex- and ethnicity-specific age-adjusted PMRs were calculated for Caucasian, African- American, and Hispanic men and women using a computer program developed at NIOSH (Dubrow et al., 1987). This program was designed to calculate PMRs for occupation or industry specifically for population-based data. It calculates PMRs by comparing the proportion of deaths from a specified cause within a specified occupation or industry group with the proportion of deaths due to that cause among the comparison population, and age-adjusts after stratification on race (Caucasian and African-American) and ethnicity (Hispanic). A PMR above 100 is considered elevated over the average for all occupations. Ninety-five percent confidence intervals (95% CI) for the observed PMRs were calculated. If the observed number of deaths was 1000 or less, the 95% CI was computed based on the Poisson distribution (Bailar & Ederer, 1964); otherwise, test-based CIs were calculated using the Mantel and Haenszel χ^2 test (Mantel & Haenszel, 1959). Statistical significance ($p < 0.05$ for a two-sided test)

and 95% CIs should be evaluated in the context of hypothesis generation because multiple comparisons were made (Rothman, 1986).

A PMR above 100 is considered elevated over the average for all occupations. PMRs indicate whether the proportion of deaths due to a specific cause appears to be high or low for a particular occupation and estimate the death rate. Ninety-five percent confidence intervals (95% CI) for the observed PMRs were calculated. Due to confidentiality agreements with states, the number of deaths was reported in the tables as '<5', when a cell is based on less than 5 deaths.

Results

Table 1 displays PMRs for the total number of correction personnel suicides and suicides listed by race and gender for the years 1999, 2003-2004, and 2007. There were 73 total suicide deaths among corrections personnel, resulting in a significantly higher PMR for suicide than expected (PMR=141, 95% CI=111-178). In total, the PMR represents a 41% higher risk for suicide among correction personnel compared to all decedents in the study population who were employed during their lifetime.

Table 1. Proportionate Mortality Ratios (PMRs)*** for Suicide: Corrections officers by Race and Sex, Ages 18-90, 23 U.S. States. CDC/NIOSH National Occupational Mortality Surveillance, 1999, 2003-2004, 2007.

TOTAL SUICIDES									
Deaths		PMR	95% CI		****				
73		141**	111-178						
SUICIDES- RACE AND SEX: MALES									
Caucasian Males			African-American Males			Hispanic Males			
Deaths	PMR	95% CI	Deaths	PMR	95% CI	Deaths	PMR	95% CI	
59	134*	102-173	<5	85	18-249	<5	99	20-289	
SUICIDES-RACE AND SEX: FEMALES #									
Caucasian Females			African- American Females						
Deaths	PMR	95% CI	Deaths	PMR	95% CI				
9	199	91-377	<5	-----	-----				

Deaths=22,831
ICD (10) codes x60-X64, Y870.
sig.* $p < 0.05$ sig.** $p < 0.01$
***A PMR above 100 is considered elevated over the average for all occupations.
**** 95% Confidence Intervals.
Data on Hispanic female corrections suicide not available

Proportionate mortality for suicide was also examined by race and gender. Among white males, 59 deaths were recorded in the corrections category, representing a significantly higher risk for suicide than expected for this population (PMR=134, 95% CI=102-173) (Table 1). There were nine suicides among white female corrections personnel (PMR=199, 95% CI=91-377). Although not significantly elevated, this PMR suggests an almost two-fold risk of suicide among female corrections officers. Deaths for African-American and Hispanic male corrections personnel numbered less than five and were not reported for reasons of confidentiality. There were less than five suicides among African-American corrections females and not analyzed for identity confidentiality reasons.

Discussion

The present study assessed corrections age-adjusted suicide risk compared to the general U.S. working population utilizing the CDC/NIOSH NOMS database. Overall, PMRs for suicide were significantly higher than the general U.S. working population for all corrections officers combined (PMR=141, sig. $p < 0.01$, 95% CI=111-178), with Caucasian males representing the majority of suicides in this occupation (PMR=134, $p < 0.01$, 95% CI=102-173). Interestingly, the risk of suicide for female corrections officers was approximately 2-fold higher than women in the general population (PMR=199). Although not significant, this result suggests that women officers may be at risk for suicide by virtue of this occupation. This result should be interpreted with caution since there are such a small number of suicides among correctional females. Women officers are generally subjected to additional stressors in male dominated corrections work. Female officers are likely to encounter higher levels of harassment, overt hostility, and other negative social interactions on the job (Martin, 2004). He, Zhao and Ren (2005) comment that more research is needed to further explore the relationship between race, gender, police organizational culture, and the occupational stress of officers.

Work exposures responsible for the elevated proportionate suicide mortality in this occupation should be considered in future research. For example, Dowden and Tellier (2004) listed several predictors of corrections stress such as age, high work demands and low control, dangerousness and low social support, which may precipitate depression and subsequent suicidal thinking. Violanti, Fekedulgen, Andrew, Hartley, Manatskanova, and Burchfiel (2008) examined the association between depressive symptoms and

suicide ideation in law enforcement officers. For each standard deviation increase in depression symptoms, the prevalence ratio (PR) of suicide ideation increased 73% in female officers (PR = 1.73, 95% CI = 1.32-2.27) and 67% in male officers (PR = 1.67, 95% CI = 1.21-2.30).

PTSD has also been associated with suicide in previous research. As pointed out by Denhof and Spinaris (2013) in their study on depression and PTSD among U.S. corrections officers, PTSD and stress contribute independently to suicidal behavior. Others have reported similar results (Oquendo, et al., 2003; Sareen, Houlihan, Cox, & Asmundson, 2005). A recently published longitudinal study of PTSD showed that elevated lifetime rates of full and partial PTSD among police officers were associated with elevated suicide rates (Pietrzak, Goldstein, Southwick, and Grant, 2011). Studies of veterans with PTSD have reported an increase risk of suicidal behavior (Ferrada-Noli, Asberg, Ormstad, Lundin, & Sundbom, 1998; Freeman, Roca, & Moore, 2000). Alcohol misuse has been characterized as a problem among law enforcement occupations of which corrections is an integral part (Richmond et al., 1998). Alcoholism is the second most common diagnosis among suicides, occurring more often in men than in women (Joiner & Rudd, 1995; Volpicelli, Balaraman, Hahn, Wallace, & Bux, 1990). The law enforcement culture reinforces the use of alcohol as a social and psychological device for coping with the stresses of the job (Violanti, 2004). Violanti, (2004) found that taken together, the comorbid risk of high PTSD and alcohol use increased the odds of suicide ideation approximately ten times over law enforcement officers who had lower trauma levels. These results concur with previous work (Carlier, Lamberts, & Gersons, 2000).

Advantages and Limitations

The PMR can be affected by disproportionate increased or decreased mortality from other causes of death. For example, very high PMRs due to large causes of death such as heart disease or injury can lower cancer PMRs. (McDowall 1983.) However, PMR comparison with other working populations limits the impact of the healthy worker effect—i.e., all causes mortality in workers is low during the working years compared to the general population due to selection processes in employment (Park., Maizlish, Punnett, Moure-Eraso, & Silverstein, 1991; Checkoway, Pearce, & Kriebel, 2004). Corrections suicide data may be further biased by the misclassification of suicides, resulting in lowered rates (Phillips & Ruth, 1993; Aldridge & St. John, 1991; O'Carroll, 1989;

Pescosolido & Mendelsohn, 1986). A previous study found that approximately 17% of law enforcement suicides were misclassified as suicides; determined by a panel of three medical examiners (Violanti, Vena and Marshall, 1996).

The impact of corrections occupationally based factors and their association with the etiology of suicide have not yet been fully explored. Unfortunately, the NOMS database does not contain any control variables that are immediately accessible. It is necessary to submit a personal request to NOMS in order to access any protected confidential data. There is public use data available from NOMS, but it does not contain detailed information that might be required to perform more complex statistical analysis. Denhof and Spanaris (2103) point out that additional information on conditions associated with elevated suicide risk remain to be collected within the corrections occupation, such as rates broken out by facility/agency type, job role/type, and work environment conditions (e.g., level of exposure to violent experiences, job attributes, social support, decision latitude, and workload). These same authors suggest programs designed to enhance the understanding of work culture, educate workers as the negative effects of stress and trauma, and encourage leadership to model healthy work behaviors (Denhof & Spanaris, 2013).

There has been some attention given to corrections officers in film regarding suicide (Stack & Bowman, 2011). Such films may be of use in ordering the etiology of suicide among persons in this occupation.

Future research should include etiologic studies that can evaluate these potential occupational factors and precipitants that lead to increased suicide risk. This can inform preventive actions to reduce the risk of suicide in the corrections occupation.

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