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High Mortality Rates Among Inmates During the Year Following Their Discharge from a French Prison*

ABSTRACT: While the poor health status of prisoners has been highlighted in Western countries, the surveillance of their mortality has been neglected. We studied the mortality of 1305 prisoners released during 1997 from a French prison. Vital status after release was obtained for 86.4% of them. Compared with the general population, ex-prisoners non-natural mortality rates were significantly increased both in the 15–34 and 35–54 age categories (3.5-fold and 10.6-fold respectively) and the risk of death due to overdose was 124 and 274 times higher in the same categories respectively. Prevention and care should be reinforced in the pre-release period without waiting more epidemiological data.

KEYWORDS: forensic science, mortality, prisoners, epidemiology, injecting drug use, overdose

While the poor health status of prisoners has been highlighted in Western countries (1,2), the surveillance of their mortality has been neglected (3–5). Within the evaluation of a pre-release prevention program in one of the major French prisons, we studied the mortality rate and causes of deaths in a sample of prisoners during the year following their release.

Methods

We studied a retrospective cohort of male prisoners, born in France, aged less than 55 years and released between January 1, 1997 and December 31, 1997 from the Fresnes prison (Paris area) that hosts about 2200 inmates. Dates of incarceration and release, together with information necessary for identification, were obtained from the prison administrative department. Vital status of these persons in 1997 and 1998 was provided by the National Institute of Statistics and Economical Studies (INSEE). For those successfully identified and who died during this period, causes of death were provided by the National Institute of Health and Medical Research (INSERM) in charge of death certificate registration in France. Regarding unknown death causes, information was sought from the Paris medico-legal institute (PMLI) in charge of autopsies. Because most of these autopsies are carried out in the frame of judicial inquiries, the PMLI is not allowed to communicate routinely the causes of death of autopsied subjects to INSERM (6). A special authorization is needed and was obtained for this study. The protocol and procedures guaranteeing the anonymity of the analyzed database were validated by the national board for computer privacy in compliance with French law.

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We used standardized mortality ratios (SMR) to compare the mortality experience of our cohort with that of the French general population. The SMR is the ratio of the number of observed deaths in the studied population to the number of deaths that would be expected if the mortality was the same in the studied population as in the general population. The expected number of deaths is obtained applying age specific mortality rates of the general population to the studied population (7). The SMR was calculated separately for deaths due to overdose, natural, and unnatural causes. Due to the relatively low number of deaths observed in the cohort, Poisson methods were used for the estimation of confidence intervals (8). Mortality data were coded according to the 9th edition of International Classification of Diseases (WHO, 1977). Population numbers were derived from the last national population census (INSEE, 1999). All analyses were carried out on Stata 6.0® (Stata Corporation, TX).

Results

Vital status after release was obtained for 1127/1305 (86.4%) prisoners. Prisoners for whom vital status was unknown did not differ significantly for age, mean duration of incarceration and age at incarceration from the others (Table 1).

As Fresnes prison is the only French prison with a hospital, we excluded from analyses 12 deaths that occurred among prisoners who had been transferred for medical reasons from another prison. Nineteen other deaths occurred in the study period. Among natural deaths, 1/7 was due to AIDS/HIV, 3/7 to a cardiovascular disease, 1/7 to a respiratory disease, 2/7 to an alcoholic liver cirrhosis; among unnatural deaths, 4/11 were due to overdose and occurred between 15 days and 12 months after the release from prison, 5/11 to other accidents and 2/11 to suicide. The cause of death remained unknown for 1 ex-prisoner (Table 2).

Compared with the general population, the mortality rate for all causes was significantly higher among ex-prisoners, both in those aged 15–34 and 35–54 years (Table 3). Compared with the general population, ex-prisoners unnatural mortality rates were increased

both in the 15–34 and 35–54 age categories (3.5-fold and 10.6-fold respectively) and overdose mortality rates were 124 and 274 times higher for 15–34 and 35–54 age categories, respectively. Finally, the natural mortality rate was significantly increased (8.7-fold) for the 15–34 category only.

Discussion

This study is the first French attempt to estimate the mortality rate among released prisoners, and to compare it with the general population—13.6% of prisoners were lost from follow-up and consequently their vital status remained unknown. Identification given by the penitentiary administration and/or procedures used to retrieve vital status in the national database may not be fully reliable. Bias cannot be excluded but prisoners for whom vital status was unknown did not differ for age and incarceration duration.

TABLE 1—*Comparison of the characteristics of the subjects identified in INSEE* vital statistics and those not identified in the cohort.*

	Not Identified	Identifed	*p*
Number of subjects in the cohort (%)	178 (13.6)	1127 (86.4)	
Mean age in 1997 (years) (± sd)	31.6 ± 7.8	32.0 ± 8.3	0.5
Mean incarceration time (months) (± sd)	6.7 ± 7.0	6.3 ± 8.6	0.5
Mean age at the incarceration (± sd)	31.1 ± 7.8	31.5 ± 8.2	0.5

* INSEE: National Institute of Statistics and Economical Studies.

TABLE 2—*Distribution of the deaths of ex-prisoners according to their causes.*

	Age at Death (Years)	
Causes of Death	15–34	35–54
Natural	4	3
HIV/AIDS	1	0
Cardiovascular	2	1
Respiratory	1	0
Liver cirrhosis	0	2
Unnatural	4	7
Accidents other than overdose	1	4
Overdoses	3	1
Suicides	0	2
Unknown	1	0

Very few data have already been published on the issue of mortality in ex-prisoners. In Finland, a higher mortality of ex-prisoners during the first two years after their release was also evidenced compared with an age and sex matched population (4); accidents, homicide and suicide represented the majority of the observed causes, as we also observed. On the contrary, in Maryland, the male inmates mortality was found to be 39% lower after adjustment for age and race than the general population in 1979–87 (5). Our results confirm the study performed in Scotland that highlighted the impressive death rate from overdoses in the post-release period (3). If we recognize that suicides and overdoses are preventable causes of death, our study underlines the lack of prevention and care in the pre-release period. It also reinforces the conclusions of other studies that highlighted the poor health and psycho-social status of this population (1,2).

Epidemiological surveillance of prisoners could be greatly improved if national databases were designed to allow linkages between health data, including drug information, mortality and penitentiary information. In countries where prison surveillance of HIV, hepatitis and drug use has not been implemented yet (9), but where good registration systems exist, such as several Eastern countries, mortality studies among prisoners could be recommended as complementary and/or alternative ways to evaluate the need for prevention and to alert decision-makers.

In our study, very high and significant SMR were found for overdoses, natural and unnatural causes of death, despite large confidence intervals due to the small number of observed cases. The results of this study will have to be confirmed in a larger and more representative sample of prisoners in France. However, more epidemiological data should not be awaited any longer to prompt a strong reinforcement of health care and prevention for prisoners, and to implement pre-release care and prevention programs. This is especially true of injecting drug users whose incarceration rate is high and for whom incarceration offers a good opportunity for such programs.

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TABLE 3—*Comparison of the mortality of ex-prisoners with the French male general population.*

	15–34 Years		35–54 Years	
Causes of Death	Observed	SMR (CI95%)*	Observed	SMR (CI95%)*
All causes	9	503 (230–956)	10	377 (181–694)
Non natural (including overdoses)	4	349 (95–894)	7	1060 (426–2183)
Natural	4	873 (238–2235)	3	167 (35–489)
Overdoses	3	12414 (2561–36272)	1	27424 (694–152797)
All causes (excluding overdoses)	6	340 (125–740)	9	340 (156–646)

* SMR: standardized mortality ratio. It compares the mortality among the prisoners with that of the general population of same age categories after age standardization. A SMR of 100 signifies that the standardized mortality rates of the compared populations are identical; a SMR of 503 signifies that the mortality of prisoners is 5.03 higher than in the general population. CI: 95% confidence interval.

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