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Circumstances and Causes of Death Among Prisoners in France: The Preponderance of Violent Deaths

The poor living conditions in prisons – a regular topic of public debate in France – have effects on mental and physical health. An article in Population 69(4), 2014 analysed the excess suicide mortality of the prison population in relation to the general population. What is the situation for other causes of death? This article extends the analysis to all causes of violent and natural deaths in the male population and examines the conditions in which these deaths occur. The results show the potentially harmful effects of prison on inmate survival. Suspensions of sentence for medical reasons limit the frequency of natural deaths in detention.

As of 1 January 2018, 79,785 individuals in France were prisoners, or “sous écrou”.⁽¹⁾ Of these, 68,974 were being held in a prison establishment and 10,811 were benefiting from an adjusted sentence or parole with restrictions (*libération sous contrainte*),⁽²⁾ such as outside placement,⁽³⁾ electronic monitoring,⁽⁴⁾ or day parole.⁽⁵⁾ Various studies have shed quantitative light on certain aspects of this population’s state of health: disabilities (Désesquelles, 2005), mental health

(1) Monthly statistic of prisoners in France, Ministère de la Justice, DAP/Me5. Imprisonment (*écrou*) is a legal instrument by which an individual is placed under the authority of a prison establishment. Some prisoners (those benefiting from an adjusted sentence or conditional release) are not in custody.

(2) Form of executing a sentence that enables the convicted individual to perform an activity (work, training, etc.), maintain family relationships, or receive medical treatment outside a prison establishment. Source: French Ministry of Justice website <http://www.justice.gouv.fr/les-mots-cles-de-la-justice-lexique-11199/>

(3) Every day, after work, the individual must return to the premises of the institution that supervises and accommodates him.

(4) An electronic tag (ankle monitor) enables the remote monitoring of a convicted individual’s presence or absence at a location and for a period decided when the sentence was delivered.

(5) After work, the individual returns to a semi-custodial centre.

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(Falissard et al., 2006), and prevalence of HIV and hepatitis C infection (Chiron et al., 2013). All these works, in line with those conducted abroad (Godin-Blandeau et al., 2014), found that the state of health among prisoners was very poor compared with that of the general population. This situation is partly the result of a selection bias at entry towards people already in poor health or likely to develop it early, which is apparently related to the social background-based selectivity that operates in relation to imprisonment (De Bruyn and Kensey, 2014). Living conditions in prison are also to blame. As a recent report by the French Court of Auditors states:

Incarceration, promiscuity, violence, inactivity, isolation, and the breakdown of family relationships act as negative determinants of health among individuals in custody. In older prisons..., lack of hygiene is a particular issue: lack of hot water or showers in cells (detainees can only shower three times a week), presence of vermin, inadequate insulation, etc. Overpopulation only increases these problems....⁽⁶⁾

For the past two decades, the ageing of the prison population has resulted in the emergence of a population affected by chronic illness or suffering loss of independence (Brillet, 2013; Touraut and Désesquelles, 2015).⁽⁷⁾

In this context, we would expect the mortality of prisoners to be high. In France, between 2000 and 2010, an average of 230 prisoners died each year. Is this more than expected? What were the causes of these deaths? The research we conducted provides answers to these two questions. Our analysis was based on the ad hoc collection of data from files archived at the French Ministry of Justice. The data we collected also enabled us to determine the circumstances in which these deaths occurred. This study is one of the first to look at all deaths, irrespective of cause, among prisoners in France.

I. Excess mortality from suicide and reduced mortality for other causes?

We have long been aware that suicide is common in French prisons (Chesnais, 1976; Bourgoïn, 1998). The most recent works in this area are those of Duthé, Hazard, and Kensey (2011 and 2014). They are based on the numbers of suicides recorded by the Direction de l'administration pénitentiaire (DAP), the French prison service, part of the French Ministry of Justice. The national statistics on causes of death produced by Institut national de la santé et de la

(6) "L'enfermement, la promiscuité, la violence, l'inactivité, l'isolement et la rupture des liens familiaux agissent comme autant de déterminants négatifs sur la santé des personnes détenues. Dans les prisons anciennes..., les carences en matière d'hygiène sont particulièrement problématiques : absence d'eau chaude et de douche dans les cellules (les détenus ne pouvant prendre une douche que 3 fois par semaine), présence de nuisibles, mauvaise isolation, etc. La surpopulation renforce encore ces difficultés...." (Cour des comptes, 2014, p. 269).

(7) The population of prisoners aged 60 years or older increased from 449 in 1990 to 3,021 in 2015.

recherche médicale (INSERM), the French national health and medical research institute, do not allow us to identify the specific deaths of prisoners. The DAP's classification system is based primarily on the conclusions of autopsies, which are routinely requested by the court in cases of suspected suicide. Disputed cases are then reviewed by the Central Commission for the Prevention of Suicide and Monitoring of Suicidal Acts, a committee formed of DAP representatives, an expert psychiatrist, and a representative of the Ministry of Health. According to the DAP, half of all deaths observed each year are suicides.⁽⁸⁾ Based on this classification, Duthé et al. (2014) demonstrated significant excess mortality from suicide among prisoners compared with the general population. Risk of suicide was particularly high among pretrial detainees⁽⁹⁾ and among perpetrators of serious offences (homicide, rape, sexual assault, and deliberate acts of violence). The causes of suicide in prison are complex (Fernandez, 2009; Rabe, 2012). The impact of incarceration on an individual's mental state is indisputable, but the high prevalence of mental health disorders among incarcerated individuals also plays a significant role (Falissard et al., 2006; Godin-Blandeau et al., 2014).

According to the DAP, half of all deaths are attributable to other violent causes (accident, homicide, etc.)⁽¹⁰⁾ or to so-called natural causes. Do we also observe excess mortality for these causes of death? In terms of violent causes other than suicide, it is often claimed that prison plays a protective role because people in prison are shielded from certain accident risks (traffic accidents, workplace accidents, etc.). However, violence does exist behind the prison walls, and the prevalence of psychoactive drug use exposes inmates to the risk of death by overdose (Godin-Blandeau et al., 2014). Regarding natural causes, Fazel and Benning (2006) write that "Prisoners have increased rates of morbidity... However, uncertainty exists over whether this increased morbidity is associated with raised mortality" (p. 441). One reason for this potential paradox is better access to healthcare in prison. In this respect, the French law of 18 January 1994 on the reorganization of prison healthcare has seemingly improved the situation for prisoners.⁽¹¹⁾ Under this law, prisoners' health is covered by ordinary law. A medical assessment is generally performed during the week after they are first detained. Prisoners can then see a doctor via the establishment's health unit.⁽¹²⁾ However, 20 years after the law's enactment, the Court of Auditors (2014) still maintained that the care offer remained incomplete. Mortality from natural causes may also be lower than expected

(8) The proportion varies very little from one year to the next.

(9) A person who has been charged but whose case has not yet been tried.

(10) Using World Health Organization terminology, these are referred to as external causes.

(11) French law 94-43 on public health and social protection.

(12) For further details, see the *Guide méthodologique sur la prise en charge des personnes sous main de justice* [Methodological guide to the care provision for individuals under criminal justice control] published jointly by the French Ministry of Health and Ministry of Justice in 2012. Available at http://www.justice.gouv.fr/art_pix/Guide_Methodologique__Personnes_detenues_2012.pdf

due to suspension of sentence or conditional release measures for medical reasons (see Box), meaning that people with a higher risk of death are excluded from the observation. Finally, the frequency of suicides may mathematically reduce the proportion of natural causes of mortality. A person's death by suicide excludes the possibility of death due to other causes.

Studies conducted outside France on this issue have approached it with varying levels of precision in terms of distinguishing causes of death and profiling the detainees. In the United States, Salive et al. (1990) compared the mortality rate among men held in a Maryland prison between 1979 and 1987 with that of the male population of the same state. All-cause mortality was 0.61 times lower in prison than outside it. The assessment by cause of death only revealed excess mortality among prisoners for suicides and infectious diseases. Based on a 15-year follow-up of over 23,000 people imprisoned in Georgia (United States), Spaulding et al. (2011) also observed reduced all-cause mortality, with a standardized ratio between prisoner mortality and that of the general population (standardized mortality ratio, or SMR) of 0.85. Kim et al. (2007) reached a similar conclusion (SMR = 0.62). Although mortality appears to be lower among prisoners for most diseases, it is higher for suicides and overdoses, but the difference is not significant, no doubt due to the small numbers involved (178 deaths). The study conducted by Brittain et al. (2013) also describes reduced mortality among the inmates of New York jails compared with the city's population (SMR = 0.86). The results by cause of death are less unequivocal. For certain causes (cancer, flu, and accidents), mortality is lower in prison than out of it, but for others (cardiovascular disease, HIV infection, chronic liver disease, homicide, and suicide), it is higher in prison. In certain studies, results depended on the age group in question. A report on all US state prisons between 2001 and 2004 (Mumola, 2007) found reduced mortality among prisoners aged 15 to 44 years and excess mortality for those aged 55 to 64 years (SMR = 1.56). These results do not consider the ethnic composition of the two populations. However, the study also showed that although risk of death was lower in prison than out of it for blacks, the situation was reversed for whites and Hispanics. In a report looking this time at US jails between 2000 and 2007, Noonan (2010) considered individuals' age, sex, and Hispanic or non-Hispanic origin for the comparison. Only the suicide mortality rate was higher among prisoners. The study conducted by Rosen et al. (2011) on mortality in the state prisons of North Carolina between 1995 and 2005 also differentiated prisoners based on ethnicity. They observed lower mortality rates among black male prisoners compared with blacks in the general population (all-cause SMR of 0.52), including for suicides and other violent causes. As for white men, the difference compared with the general population varied according to age (higher mortality among 50–79 year olds and lower mortality among 20–49 year olds) and according to cause (lower accident mortality, higher cancer and HIV mortality). Patterson (2010), using the data from 29 US states between 1985 and 1998, does not differentiate causes of death but also shows

Suspension of sentence for medical reasons

Suspension of sentence for medical reasons (SSMR) is a measure introduced by the French law of 4 March 2002 on patients' rights and the quality of the health system, dubbed the Kouchner Law. Article 10 states that a suspension of sentence may be ordered "irrespective of the nature of the sentence or of the length of sentence remaining, and for an indefinite period of time, for convicts proven to suffer from a life-threatening disease or to be in a state of health that is permanently incompatible with continued detention, excluding cases involving the hospitalization of persons held in health institutions for mental disorders".

Except in emergencies, two separate medical expert reports had to prove that the person was in one of the situations stipulated by the law. In addition, the measure could only be granted absent any serious risk of re-offending. Conditional release could also be granted to convicts needing to receive medical treatment.

The law of 15 August 2014 on the individualization of sentences has made the conditions under which an SSMR is granted more flexible in order to speed up the process. Only one medical expert report is now necessary. Conditional release for medical reasons can be requested by all detainees, whether on remand or sentenced.

lower mortality rates among black male prisoners and higher mortality rates among white male prisoners compared with the same ethnic groups among the general population. Without explaining all the differentials, Patterson provides evidence to support the hypothesis that imprisonment exerts a protective effect (safety hypothesis) on populations that are generally disadvantaged among the general population.

Studies carried out in other foreign countries have produced somewhat different results from those observed in the United States. For the Canadian province of Ontario, Wobeser et al. (2002) observe higher mortality among men imprisoned between 1990 and 1999 for all causes except cancer. Fazel and Benning's study (2006) on 1,631 male prisoner deaths that occurred in England and Wales between 1978 and 1997 also concluded that all-cause mortality was higher among prisoners (SMR = 2.93) but highlighted reduced mortality due to natural causes among prisoners aged under 60 (SMR = 0.70). Graham et al. (2015), in a study of all Scottish prisons between 1996 and 2007, observe reduced mortality among male prisoners compared with the general population (SMR = 0.6), but excess mortality among female prisoners (SMR = 1.9).

The most common conclusion of all these works is lower mortality rates among male prisoners compared with the general population. Excess mortality from suicide seems to be offset by reduced mortality for all or some natural causes of death. The characteristics of the prison populations in the countries where these studies were conducted make it risky to apply their results to France. In France, until recently, only one study was available, for the period 1977–1983 (Clavel et al., 1987). It found lower mortality among male prisoners for so-called natural causes (SMR = 0.84) and for accidents (SMR = 0.34).

Recently, Chan Chee and Moutengou (2016) published an in-depth study on the 2000–2010 period. It is based on the parallel use of national statistics on causes of death and the files on prisoner deaths produced by the DAP as they occurred (2,541 deaths over the period studied). The study confirms excess mortality from suicide among prisoners (SMR of 7.3 for men and 21.1 for women). It also shows excess all-cause mortality (SMR of 1.2 for men and 2.0 for women) but reduced mortality for many natural causes. In this study, nearly 20% of the deaths were due to unknown or poorly defined causes. Deaths in prisons always result in a forensic examination or an autopsy. However, in this scenario, the forensic institute does not always send INSERM the medical section of the death certificate. The authors of the study indicate that this was the most significant limitation of their work.

In our research, causes of death were not determined based on death certificates but on files archived by the Ministry of Justice, which contain the post-mortem reports. As in other studies (Alpérovitch et al., 2009), comparison of the two approaches provides information on the quality of the data from both sources. These files also contain information about the penal situation of the deceased and the circumstances of their death. In the literature, almost without exception, analysis of mortality differentials is limited to various sociodemographic characteristics (age, sex, and ethnicity). Following on from the work by Duthé et al. (2014) on suicide, the data we have available allow us to examine these aspects in more detail.

II. The Ministry of Justice files

Whenever a prisoner dies, an administrative file is opened by the Direction de l'administration pénitentiaire (French prison service). The information collected varies in its degree of detail. Some larger files contain all documents concerning the individual in question since their incarceration, from their trial report to a detailed account of their death. They always contain a copy of the inmate record (*fiche pénale*), i.e. the form completed at the time of imprisonment and to which, over time, information on the execution of the sentence is added (judgements, sentence reductions, etc.) This form contains the sociodemographic characteristics of the deceased (date of birth, sex, and nationality, and, at time of imprisonment, marital status, level of education, and occupation), as well as their penal characteristics (primary offence,⁽¹³⁾ date of imprisonment, penal status⁽¹⁴⁾ at time of death, length of sentence, and form of sentence execution at the time of death⁽¹⁵⁾). The circumstances of death and, where applicable, the chain of events that preceded it (place, date, and time at which the person was

(13) The offence carrying the longest sentence (often, multiple offences have been committed).

(14) On remand (awaiting trial), convicted, under appeal (having appealed a court decision made against them).

(15) Custody or sentence adjustment.

“discovered”, the person who raised the alarm, etc.) are often meticulously reported. The files often also contain copies of certain letters, such as from the Procureur de la République to the Procureur Général, or from the prison management to the interregional prison services office. These letters provide an excellent summary of the information known to the prison service, regarding both the circumstances of death and its possible cause, before the additional post-mortem reports were made (autopsy, toxicology and pathology reports, etc.). The results of these expert reports are often included in the files. However, these files are not medical files, and if a disease is not mentioned, it does not mean that the person in question did not suffer from it. The same applies in relation to various other information, such as one’s history of drug or alcohol consumption, attempted suicides or self-harm, and even whether one was receiving psychological treatment. However, where this information was contained in the files, we collected it.

All this information was collected using an ad hoc collection form. Mostly, it enabled the cause of death to be determined. As per the definitions of the World Health Organization, we used the so-called underlying cause of death, i.e. the cause at the origin of the morbid process that led to death. Usually, the evidence in the file pointed clearly to one cause of death. All deaths classified as suicide by the prison service were classed as suicides. The distinction between natural causes and violent causes was refined to distinguish, on the one hand, infectious disease, cancer, cardiovascular disease, and respiratory disease from, on the other, suicide, overdose/poisoning, and homicide. For deaths due to drug overdose/medicinal poisoning, we relied partly on the results of the toxicology reports and partly on the account of the circumstances of death and the overall conclusion given in the file.

The decision was made to work on the files from the year 2011, the most recent year for which all files were considered complete.⁽¹⁶⁾ We compared the profiles of the deceased from the year 2011 against those of everyone who was a prisoner during the same year (also called the “2011 active population”) extracted from the French prison service’s record of prison inmates (*Fichier national des détenus*, or FND). Durations of detention varied in length, and weightings to take duration of risk exposure into account were calculated and used to establish the distributions relating to the “2011 active population”. These durations of exposure were also used when calculating mortality rates. For the year 2011, we had access to 246 files on individuals who died while in custody.⁽¹⁷⁾ This is a small number of people, but the stability of the results observed from one year to the next by Chan Chee and Moutengou supports the robustness of our results.

(16) Gaining access to post-mortem reports can take some time.

(17) The record of prison inmates (FND) contains 256 deaths. After comparing the archived files against the FND, we identified 241 deaths common to both sources; 15 deaths were only recorded in the FND, and five deaths were only recorded in the archived files. The total number of deaths in 2011 could therefore be as high as 261, but we cannot exclude the possibility that errors in the information provided by one or other of the sources prevented reconciliation.

We began by examining the causes of these 246 deaths and comparing mortality rates for each broad category of causes within this population and in the general population. We then created a profile of the deceased individuals, comparing them with other prisoners, and described the circumstances of their death. The results of the quantitative analysis are supplemented by short accounts which, besides providing a useful illustration, clarify the chronology of events, connect various elements from the files, and demonstrate the complexity thereof.⁽¹⁸⁾

III. Characteristics of prisoner mortality in 2011: structure by cause and comparison of risks with the general population

1. Seven out of ten deaths are violent

The primary cause of death among prisoners in 2011 (seven out of ten deaths) was a violent cause (Table 1). Of these 178 deaths, 123 were classified as suicide by the prison service. The vast majority of these were suicide by hanging (116 cases).⁽¹⁹⁾ The other violent deaths were mostly deaths due to drug overdose or medicinal poisoning (28 cases).⁽²⁰⁾ Drugs are usually introduced to prisons during visits or upon returns from temporary release (Chantraine, 2004). Substitution therapies and other psychoactive drugs are also regularly prescribed (Obradovic, 2005). The hoarding of these drugs, sometimes accompanied by trading and trafficking practices, enables prisoners to get hold of sufficient quantities to obtain the desired psychoactive effect and, unfortunately, sometimes also to die from taking them.

Fatima⁽²¹⁾ (aged 30–39) had been in prison for a drug offence and theft. The day before her death, she returned from a temporary release and apparently brought heroin back into the prison with her. She was found dead by the custodial staff when the cells were opened (she shared her cell with other prisoners). Death was due to an overdose of heroin, the effects of which were increased by the consumption of other drugs at a suprathereapeutic dose.

There were also ten deaths by homicide and ten deaths due to various violent causes, including five to cell arson. In seven cases, the evidence in the files was insufficient to determine the cause of death with certainty, but it pointed towards violent death. It generally involved the sudden death of a drug

(18) These accounts are given in the text. They are not verbatim extracts from the files, but short summaries.

(19) There were also three suicides by asphyxiation, two by overdose, and two involving weapons.

(20) The results of the toxicology reports were available for 20 of these cases. In 13 of them, the doses recorded were over the therapeutic limit; in seven other cases, the doses were lower than the therapeutic limit, but the substances identified included heroin or a substitute product (methadone or buprenorphine).

(21) First names are fictitious.

Table 1. Causes of death among prisoners 1993–1995 and in 2011

	1993-1995		2011	
	Number of people	%	Number of people	%
Natural causes	192	36	68	28
Infectious disease	38	7	3	1
<i>of which AIDS</i>	29		<i>n/a</i>	
Cancer	31	6	14	6
Cardiovascular disease	72	13	26	11
Respiratory disease	10	2	5	2
Other disease	16	3	9	4
Unknown natural cause	25	5	11	4
Violent causes	354	65	178	72
Suicide	309	57	123	50
Overdose/poisoning	19	3	28	11
Homicide	} 26	} 5	10	4
Other violent cause			10	4
Unspecified violent cause			7	3
All deaths	546	100	246	100

n/a: not available.
Sources: For the 1993–1995 data, Guillonnet and Kensey (1997); for 2011, authors' calculations based on data from the files archived at the French Ministry of Justice.

addict but, absent the results of toxicology analyses, death by overdose could not be confirmed.⁽²²⁾

Éric (aged 30–39) had been incarcerated one year previously for theft. He was found dead in his individual cell around 7 a.m. Reported to be a heavy drug user, death due to overdose could not be confirmed because the toxicology reports were not available.

The intentionality of deaths due to overdose is difficult to assess. For the year 2011, only two deaths by overdose were recorded as suicides. In one case, the person left a letter in which they expressed their intention to commit suicide; in the other, the certifying doctor mentioned “suicidal intention” on the death certificate. It is generally impossible to determine whether the consumption of products in a significant quantity, potentially after hoarding, was intended to produce a psychoactive effect or if it was a suicide attempt. For 11 deaths not classified as suicide by the DAP, the unintentional nature of the death appears uncertain.⁽²³⁾ Those involved were prisoners who had already attempted suicide (nine cases) and/or had expressed suicidal thoughts (3 cases).

(22) Results of toxicology analyses were available for 90 of the 246 deaths. In three out of four cases (69 deaths), they were positive, with doses over the therapeutic limit for 21 deaths. Even for deaths due to natural causes, it was not unusual for the results of the analyses to be positive. The products most frequently identified at supratherapeutic doses or as a cocktail were anxiolytics. Next were substitution therapies (methadone and buprenorphine), antipsychotics, antidepressants and, much less frequently, alcohol.

(23) Nine deaths due to drug overdose or medicinal poisoning and two deaths of unknown cause.

Stéphane (aged 40–49) had been imprisoned one week earlier. An unstable person, he was a drug addict and alcoholic, and had already attempted suicide several times. In the file, it is indicated that he had hoarded medications for five days prior to his death. The death was attributed to medicinal poisoning.

We might also question deaths following cell arson, which could be a suicidal act or an act of protest.

Samir (aged 20–29) had been taken into custody several months earlier. Sentenced to over two years in prison, he had been incarcerated several weeks previously in the establishment where he died. He had been punished with four days in the disciplinary section for having a mobile phone. There he set fire to his mattress.

The two primary natural causes of death are the same as in the general French population (Mazuy et al., 2015) but in the opposite order: cardiovascular disease (26 cases) comes first, followed by cancer (14 cases). Suspensions of sentence for medical reasons granted to people with cancer may reduce the proportion of cancer deaths among prisoners. These two disease groups account, respectively, for 16% of deaths and 59% of deaths due to natural causes. Seventeen other deaths were due to various chronic or acute diseases. The causes of 11 deaths were impossible to determine, but since nothing suggests that they were violent deaths, we considered them deaths from unknown natural causes. Determining cause of death is sometimes difficult due to the existence of co-morbidities or the association between diseases and risk behaviours:

Imprisoned a year previously, Loïc (aged 20–29) was to be released in a few months. Early one morning, the guard realized that he was not moving and raised the alarm. The toxicology report revealed the presence of methadone and anxiolytics. The prisoner must have taken all his treatment. Given the autopsy report, the coroner concluded that the death was due to a natural cause, but the consumption of medicines could have caused this sudden death.

Michel (aged 60–69) had only been in prison for several months but had been sentenced to 20 years. He was sharing his cell with several other prisoners, one of whom raised the alarm at midday. Fifteen minutes later, the paramedics arrived. The toxicology reports excluded any toxic cause. The pathology report revealed several pathologies, including ones linked to alcohol consumption. The autopsy tends to favour death of cardiac origin.

Table 1 shows the results of an older study, which was also based on information provided by prison institutions to the Ministry of Justice (Guillonnet and Kensey, 1997) and concern deaths for the period 1993–1995. Without controlling for the changing age structure of the prison population, comparing these with our results is risky. In 1993–1995, the proportion of AIDS-related deaths among prisoners was not insignificant. Cardiovascular disease was already a more common cause of death than cancer. The number of violent deaths as a proportion of total deaths (65%) was slightly lower than the figure for 2011 (72%). Our distribution of deaths by cause is similar to that in Chan Chee and Moutengou (2016), in which deaths from cardiovascular

disease (12% of deaths) also exceeded those from cancer (9% of deaths, or slightly more than in our work). Violent causes represent only 50% of deaths (vs 72% in our study), but if we combine violent deaths with deaths due to poorly defined or unknown causes (19.6% of deaths), the results become very similar. Deaths from overdose/accidental poisoning appear particularly underestimated in Chan Chee and Moutengou's study (3% vs 11% in our study). In comparison, and considered with the caution demanded by the very different context, the studies mentioned above that were conducted outside France reveal a more balanced distribution between natural and violent causes (Wobeser et al., 2002; Fazel and Benning, 2006) or even a clear predominance of deaths from natural causes (Brittain et al., 2013; Graham et al., 2015; Kim et al., 2007; Mumola, 2007; Noonan, 2011; Rosen et al., 2011).

2. For all causes of death combined, being a prisoner is associated with a higher risk of death

For the year 2011, the mortality rate of prisoners was 3.55 per 10,000 people. Given that 96% of deaths involved men (Appendix Table A.1), we compared the mortality rate among prisoners with that of the general male population, considering the different age structure of the two populations (Table 2).

Table 2. Mortality rate by ten-year age group (per 10,000 individuals) in male prisoners aged 20 to 79 years, by cause of death and standardized mortality ratio (SMR)

Age group (years)	All causes				Natural causes				Violent causes			
	Rate per 10,000	Recorded deaths	Expected deaths ^(a)	SMR ^(b)	Rate per 10,000	Recorded deaths	Expected deaths ^(a)	SMR ^(b)	Rate per 10,000	Recorded deaths	Expected deaths ^(a)	SMR ^(b)
20–29	19.4	56	24	2.3 *	1.4	4	9	0.4 n.s.	18.7	54	15	3.6 *
30–39	26.9	51	23	2.2 *	4.7	9	13	0.7 n.s.	19.5	37	10	3.6 *
40–49	49.7	56	32	1.8 *	9.8	11	24	0.5 *	36.4	41	8	5.1 *
50–59	75.7	42	40	1.0 n.s.	30.6	17	36	0.5 *	39.7	22	5	4.8 *
60–69	125.3	25	27	0.9 n.s.	80.2	16	25	0.6 *	50.1	10	2	6.3 *
70–79	272.7	12	14	0.9 n.s.	181.8	8	13	0.6 n.s.	68.2	3	1	4.6 n.s.
20–79	36.1	242	159	1.5 *	9.7	65	119	0.5 *	24.9	167	40	4.2 *

(a) The number of expected deaths is calculated by applying the ten-year age group mortality rates recorded for the entire French population (data from INSERM, CépiDc) to the age group populations of the "2011 active population".

(b) Ratio of recorded deaths to expected deaths.

Significance: * $p < 0.05$; n.s.: not significant at the 5% level.

The confidence intervals of the SMR were calculated using the following formula (Breslow and Day, 1987):

$$\frac{n}{A} \left(1 - \frac{1}{9*n} - \frac{Z_{\alpha/2}}{3\sqrt{n}} \right)^3 * 10^2 < SMR < \frac{n+1}{A} \left(1 - \frac{1}{9(n+1)} + \frac{Z_{\alpha/2}}{3\sqrt{n+1}} \right)^3 * 10^2$$

n is the number of recorded deaths, A the number of expected deaths, and α is the risk of a type I error with normal distribution ($Z_{\alpha/2}$ is equal to 1.96 for the 95% confidence interval).

Source: Authors' calculations based on data from the files archived at the French Ministry of Justice.

The mortality rate of male prisoners aged 20 to 79 was 36.1 per 10,000. The SMR of 1.5 indicates excess mortality compared with the general population. As a comparison, Chan Chee and Moutengou (2016) obtained a slightly lower SMR for men (1.2), but the age group used (13 years or over) was larger.⁽²⁴⁾ Between the ages of 20 and 39, mortality was over two times higher in male prisoners than among the general population. After the age of 50, as far as we can deduce from the small sample size, all-cause mortality does not appear to be significantly different in male prisoners and the general population.

3. Connection between reduced natural-cause mortality and suspensions of sentence for medical reasons

Table 2 shows that for all natural causes, the mortality of male prisoners aged 20–79 is almost two times lower than that among the general population (SMR = 0.5). This lower mortality is detected among all age groups but is only significant between the ages of 40 and 69. As commented, one reason for this lower mortality rate could be the use of suspensions of sentence for medical reasons (SSMRs). According to the Court of Auditors' report previously cited, 925 SSMR applications were filed between 2002 and 2011, and 650 of these were accepted, an average of 65 per year. If we add these 65 annual SSMRs to the 68 deaths by natural causes for the year 2011, the prisoners' natural-cause mortality "advantage" disappears. The outcome of those granted an SSMR is unknown, and some of them may not be at the end of life. But there is no doubt that without SSMRs, the observed lower mortality would be reduced. The increased flexibility of the conditions for granting an SSMR, enacted by the French law of 15 August 2014, should further amplify this effect. Until that point, there were many obstacles to obtaining one. In life-threatening situations, the lengthy application procedure prevented some applicants from benefiting "in time". A review of the files for the year 2011 reveals evidence of this. Details of an SSMR application appear in nine case files, and in six, the application process was pending at the time of death.⁽²⁵⁾ A further 17 files contained no details of SSMR applications but concerned individuals with life-threatening conditions (primarily individuals who died from cancer) and, in one case, an individual who had suffered loss of autonomy. The mean age of death of these 26 people was 57 years. Most (22 of 26) had been convicted, and the mean time to release was nearly six years. The most common grounds for imprisonment were serious ones: homicide in nine cases and rape or sexual assault in nine others.

(24) The method of rate calculation used in the Chan Chee and Moutengou study (mean population was calculated from the mean of the populations at the start and end of the year) may also contribute to this difference, since our calculations used the duration of risk exposure.

(25) In two other cases, the individuals concerned refused to allow an application to be made. A third person with cancer had their application denied.

Jean (aged 60–69) was in prison for rape. A heavy smoker, he had been diagnosed with cancer several years prior to his incarceration; the cancer had resulted in a disability that was reported at the time of his imprisonment. He was found lifeless in his cell during the 6 a.m. rounds and pronounced dead shortly afterwards.

Bernard (aged 60–69) was in prison for several months. He was sharing his cell with other detainees, but it was the meal distribution service that raised the alarm, around midday. The paramedics arrived around 1 p.m., and he was pronounced dead shortly afterwards. He was reported to have died of cancer, for which he was receiving palliative care. He was due to have undergone medical assessment two days later for an SSMR application.

Besides these highly predictable deaths, the vast majority of the files mentioned medical history, risk behaviours (smoking, alcoholism, or drug abuse), severe mental health issues, or other signs of a poor state of health (e.g. obesity, “visible deterioration”). We calculated that there were only ten deaths due to natural causes for which nothing in the file could have enabled the death to be anticipated. Four of these deaths were due to a cardiovascular event (heart attack or stroke), one to pulmonary oedema, and five to an apparently natural but unknown cause.

Jean-Marc (aged 40–49) had been in prison for eight years. Late one morning, he told the guard that he was feeling unwell. The guard told the UCSA⁽²⁶⁾ staff, who quickly arrived. No previous history or risk behaviour appeared in the file. Half an hour later, he was found unconscious in his cell. Despite the intervention of the paramedics, he could not be revived.

4. Excess mortality from suicide higher than for other violent causes

The increased frequency of violent causes among prisoner deaths is associated with very significant excess mortality compared with the general population (Table 2). The mortality rate due to violent causes among male prisoners aged 20 to 79 is 24.9 per 10,000, and the SMR is 4.2. This excess mortality increases with age until the age of 70. At 60–69 years of age, the ratio is 6.3 compared with 3.6 at 20–29.

The results in Table 3 clarify these findings by distinguishing suicides from other violent causes. The suicide mortality rate among prisoners aged 20 to 79 (17 per 10,000) is identical to that observed by Duthé et al. (2014) for the 2006–2009 period. Besides a noticeable drop for the 30–39 age group, this rate increases with age and exceeds 40 per 10,000 after the age of 60. Excess mortality from suicide compared with the general population (SMR = 6.7) is high among all age groups but also increases with age (SMR of higher than 10 for age 60 and over).

For violent causes other than suicide, the mortality rate among male prisoners (7.9 per 10,000 for ages 20–79) is also significantly higher than among

(26) *Unité de consultation et de soins ambulatoires* (consultation and ambulatory care unit).

Table 3. Mortality rate by ten-year age groups (per 10,000) due to suicide and other violent causes in male prisoners aged 20 to 79 and standardized mortality ratio (SMR)

Age group (years)	Suicides				Other violent causes				
	Rate per 10,000	Recorded deaths	Expected deaths ^(a)	SMR ^(b)	Rate per 10,000	Recorded deaths	Expected deaths ^(a)	SMR ^(b)	
20–29	13.2	38	5	7.9 *	5.5	16	10	1.6	n.s.
30–39	9.5	18	5	3.6 *	10.0	19	5	3.7 *	
40–49	25.7	29	4	6.7 *	10.6	12	4	3.2 *	
50–59	34.2	19	2	8.8 *	5.4	3	2	1.2	n.s.
60–69	40.1	8	1	13.4 *	10.0	2	1	2.0	n.s.
70–79	45.5	2	0	10.2 *	22.7	1	0	2.2	n.s.
20–79	17.0	114	17	6.7 *	7.9	53	23	2.3 *	

(a) The number of expected deaths is calculated by applying the ten-year age group mortality rates recorded for the entire French population (data from INSERM, CépiDc) to the age group populations of the “2011 active population”.

(b) Ratio of recorded deaths to expected deaths.

Significance: * $p < 0.05$; n.s.: not significant at the 5% level.

Source: Authors’ calculations based on data from the files archived at the French Ministry of Justice.

the general population for the same age structure, but the difference is less than for suicides. In each age group, the difference between the two populations is always to the disadvantage of the prison population but, likely due to the small sample sizes, is only significant for ages 30 to 49. We should mention at this point that one-third of deaths due to a violent cause other than suicide involved individuals granted a sentence adjustment (versus only 10% of all deaths). These people appear to be less protected than those incarcerated against the risk of certain types of violent death (such as accident or homicide).⁽²⁷⁾

IV. Profiles of the deceased and circumstances of their death

1. Sociodemographic and penal characteristics of the deceased individuals

Unsurprisingly, age is the most distinguishing feature of those who died compared with other prisoners. This is shown by the multinomial regression analyses (Tables 4 and 5).⁽²⁸⁾ In the first, very simple regression analysis, the only confounding variable included was age group. The dependent variable comprised three categories: death by natural cause, death by violence, and survival. The odds ratios increase with age for both death by natural cause and death by violence, but they are much higher for the former than the latter. For all causes of death combined, the mean age of those who died was

(27) Of these 17 deaths, seven were homicide, three were an accident, and seven were due to overdose.

(28) The analyses were performed on the 241 deaths common to both the FND and the Ministry of Justice archives.

Table 4. Probability of dying by cause and sociodemographic characteristics (multinomial logistic regression analyses)

	Natural deaths (<i>n</i> = 68)		Violent deaths (<i>n</i> = 173)		Significance of the variable
	Odds ratio	Significance	Odds ratio	Significance	
Age group at death (years)					
Under 30 (<i>Ref.</i>)	1		1		***
30–39	2.8	***	1.5	*	
40–49	6.3	n.s.	2.1	n.s.	
50–59	18.8	***	2.7	< 0.05	
60 and over	61.0	***	3.7	**	
Sex^(a)					
Male (<i>Ref.</i>)	1		1		n.s.
Female	1.2	n.s.	1.6	n.s.	
Nationality (at imprisonment)^(a)					
France (<i>Ref.</i>)	1		1		n.s.
European country (other than France)	1.0	n.s.	0.9	n.s.	
Other country	0.9	n.s.	0.7	n.s.	
Marital status (at imprisonment)^(a)					
Single (<i>Ref.</i>)	1		1		n.s.
Divorced/separated	1.1	n.s.	1.1	n.s.	
Married	0.7	n.s.	1.0	n.s.	
Widowed	1.4	n.s.	0.7	n.s.	
Level of education^(b) (at imprisonment)^(a)					
Lower secondary vocational (<i>Ref.</i>)	1		1		n.s.
No academic qualification/illiterate	1.7	n.s.	1.0	n.s.	
Primary	1.4	n.s.	1.0	n.s.	
Secondary	1.3	n.s.	1.1	n.s.	
Upper secondary	0.8	n.s.	0.8	n.s.	
Higher education	0.6	n.s.	2.0	**	
Other	1.5	n.s.	0.9	n.s.	
Employment status (at imprisonment)^(a)					
Unemployed: jobseeker (<i>Ref.</i>)	1		1		*
Employee	0.6	n.s.	1.0	n.s.	
Other worker	0.6	n.s.	0.5	*	
Unemployed: no occupation	0.9	n.s.	1.1	n.s.	
Retired	1.0	n.s.	0.9	n.s.	
Disabled	0.9	n.s.	2.8	***	
Other non-worker	1.2	n.s.	1.0	< 0.05	
(a) Effect of the variable after controlling for age group.					
(b) The categories are grouped versions of those used in the inmate record (<i>fiche pénale</i>) and the FND.					
Significance levels: n.s.: not significant at the 5% level; * $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$.					
Source: Authors' calculations based on data common to both the FND and the French Ministry of Justice.					

42.3 years compared with 34.5 years for the “2011 active population” (Appendix Table A.1). Deaths by violence occurred among those younger, on average (38.4 years), than those who died due to natural causes (52.5 years). Most prisoner deaths were premature deaths: seven out of ten deaths involved

Table 5. Probability of dying by cause and penal characteristics (multinomial logistic regression analyses)

	Natural deaths (n = 68)		Violent deaths (n = 173)		Significance of the variable
	Odds ratio	Significance	Odds ratio	Significance	
Time spent as a prisoner^(a)					
Under 1 month	1.7	n.s.	10.0	***	***
1 month or over, but under 6 months (Ref.)	1		1		
6 months or over, but under 1 year	0.9	n.s.	0.6	***	
1 year or over, but under 5 years	0.9	n.s.	0.7	***	
5 years and over	1.8	< 0.05	0.6	***	
Primary offence^(a)					
Theft (Ref.)	1		1		***
Sexual assault	0.6	n.s.	0.9	n.s.	
Road traffic offence	0.6	n.s.	0.4	*	
Homicide	2.8	***	2.4	***	
ILS	0.5	n.s.	0.6	< 0.05	
Rape	1.2	n.s.	1.5	**	
Violence	0.9	n.s.	1.1	n.s.	
Other	0.9	n.s.	0.6	< 0.05	
Penal status^(a)					
Convicted (Ref.)	1		1		***
Under appeal	5.0	***	3.3	< 0.05	
Pretrial detainee	0.7	**	3.2	**	
Length of sentence (convicted detainees)^(a)					
Under 6 months	< 0.1	n.s.	0.6	n.s.	***
6 months or over, but under 1 year	0.4	n.s.	0.7	n.s.	
1 year or over, but under 2 years	0.9	n.s.	0.8	n.s.	
2 years or over, but under 5 years (Ref.)	1		1		
5 years or over, but under 10 years	0.6	n.s.	0.6	< 0.05	
10 years and over	1.4	n.s.	0.8	n.s.	
RCP	3.6	< 0.05	4.4	***	
<p>(a) Effect of the variable after controlling for age group. ILS: <i>infraction à la législation sur les stupéfiants</i> (drug offence). RCP: <i>réclusion criminelle à perpétuité</i> (life sentence). Significance levels: n.s.: not significant at the 5% level; * $p < 0.01$, ** $p < 0.001$, *** $p < 0.0001$. Source: Authors' calculations based on the deaths common to both the FND and the Ministry of Justice archives.</p>					

individuals aged under 50 (eight out of ten violent deaths and four out of ten natural deaths).⁽²⁹⁾

Given the very strong correlation between age and most of the sociodemographic and penal characteristics taken into consideration, the profiles of those who died were determined using regression analyses in which the association between each variable⁽³⁰⁾ and risk of death was evaluated for

(29) All the results of the cross-tabulations are shown in the Appendix.

(30) The reference groups were those that were most numerous among the “active population”.

the same age groups.⁽³¹⁾ From this, it emerged that most sociodemographic characteristics were not significantly determinant of risk of death by violence or natural causes (Table 4). A high level of education was associated with a higher risk of death by violence (OR = 2). In the descriptive analysis, we observe this excess mortality for suicides (11% of those who committed suicide had a high level of education, compared with 3% of the “active population”) (Appendix Table A.1). The shock of incarceration is perhaps more intense the better educated and socially integrated the individual (Rabe, 2012). The risk of death by violence is also negatively correlated with being a non-employee worker prior to imprisonment, and positively correlated with being disabled or, to a lesser degree, belonging to the group of other non-workers.⁽³²⁾

Penal characteristics are much more of a determining factor (Table 5). Having been a prisoner for only a short time is strongly associated with excess mortality due to violent causes (OR = 10). At time of death, 17% of those who died due to violent causes (19% for suicides, 15% for other violent deaths vs 1% of the “active population”) had been prisoners for less than one month (Appendix Table A.2). Conversely, for a given age group, long stays in prison are associated with a higher risk of dying of natural causes. One-third of individuals who died of natural causes (vs 10% of the “active population”) had been prisoners for at least five years. Although half of deaths took place in the year following imprisonment, this figure is much higher for violent deaths (62%) than for natural deaths (37%).

Regarding the primary offence committed, those incarcerated for homicide have a higher risk of dying, whether due to natural causes (OR = 2.8) or violence (OR = 2.4), than those imprisoned for theft. One-third of those who died of natural causes and one-quarter of those who died due to violence – 30% for suicides versus 9% for the “active population” – were imprisoned for homicide. We also see excess mortality among rapists, but it is only significant for violent deaths, particularly for suicides: one-quarter of suicide deaths (versus 9% of the “active population”) involve rapists. This echoes the correlation observed by Duthé et al. (2014) between suicide risk and the severity of the offence committed. A feeling of guilt in relation to the act committed and difficulty accepting its consequences no doubt contribute to the motivation for suicide. In cases of deaths from natural causes, the hypothesis of a connection between the type of offence committed and a somewhat troubled life course before incarceration cannot be excluded.⁽³³⁾ Issuing SSMRs to perpetrators of serious offences, especially where there is a risk of re-offending, is also more problematic. The seriousness of the offence is correlated with the time remaining or already spent in prison, which, as we have seen, is

(31) Due to small sample sizes and strong correlations between variables (such as nature of offence and length of sentence), we were not able to perform the “all else being equal” multivariate analysis.

(32) Students, interns, apprentices, anyone doing community work (*travail d'utilité collective*, TUC), and other unspecified non-workers.

(33) Due to alcoholism, for example.

associated with higher natural-cause mortality. This result could reveal a harmful effect of time spent in prison on health. As for time remaining, it is unclear whether, faced with a future behind bars, the body ages at the same pace as outside, or whether the individual's resistance is affected. The analysis also shows that compared with perpetrators of theft, perpetrators of road traffic or drug offences have a lower risk of dying of violent causes. This result may come as a surprise if we thought drug addiction and drug offences overlapped, but this is not the case. Some perpetrators of theft are drug addicts who steal to fund their consumption.

Penal status is also a strong determinant. Compared with those already convicted, pretrial detainees have an advantage in terms of natural-cause mortality (OR = 0.7) but are at a heavy disadvantage in terms of violent causes (OR = 3.2).⁽³⁴⁾ Almost half of those who committed suicide (47% vs 13% of the “active population”) were awaiting trial. Duthé et al. (2014) attribute this higher risk of suicide among pretrial detainees to uncertainty about the sentence they will receive and to the shock produced by incarceration: “They are cut off from friends and family, their freedom is restricted, they are forced to adapt to a harsh new environment, and many of them feel very pessimistic about the future” (p. 479). Individuals whose case was subject to appeal had a high risk of death compared with those who had been convicted, both due to violent causes (OR = 3.3) or natural causes (OR = 5.0) (Table 5). In the former instance (exclusively suicides), the same hypothesis can be made as for pretrial detainees. The cases of natural deaths are more puzzling.

As for the quantum of sentence,⁽³⁵⁾ the only significant effect observed related to those given life sentences. For a given age group, these individuals have a higher risk of death (OR = 3.6 for natural causes, OR = 4.4 for violent causes) than other convicted prisoners. This result is consistent with that obtained for the perpetrators of serious offences. One-third of convicted prisoners who died in 2011 (vs 18% for the “active population”) were serving at least a ten-year sentence. Release was often a long way away: 70% of convicted prisoners who died were not due to be released for at least one year.

2. Circumstances of death

In the majority of cases, death took place in prison. Of the 246 deaths in our sample, 166 took place in prison and 59 in hospital (Table 6). The 21 remaining deaths involved prisoners who had received an adjusted sentence. Half of the deceased individuals were being held in a remand prison (*maison d'arrêt*),⁽³⁶⁾ one-third were in a penitentiary centre (*centre*

(34) More than eight out of ten deaths due to natural causes involved individuals already sentenced (Appendix Table A.2).

(35) Duration of the sentence delivered.

(36) Houses pretrial detainees as well as convicts with a sentence or remaining sentence not exceeding two years.

Table 6. Circumstances of death (% of column)

	Death by cause				Total deaths
	Natural deaths (n = 68)	Violent deaths			
		Suicides (n = 123)	Other violent deaths (n = 55)	All	
Place of death					
Prison	49	81	60	75	67
Hospital	50	15	13	14	24
Private site	1	4	16	8	6
Other	0	0	11	3	2
Nature of event					
Suicide	0	100	0	72	58
Sudden discomfort	98	0	66	18	34
Fight or other violence	0	0	15	4	3
Cell arson	0	0	11	3	2
Accident	0	0	9	2	2
Unknown	2	0	0	0	0
Institution type (detainees)					
Remand prison	39	57	42	54	49
Detention centre	20	10	16	12	14
High-security prison	5	3	3	3	4
Penitentiary centre	36	29	39	32	33
Time of "discovery"^(a)					
Early morning, 6 a.m.–9 a.m.	40	29	51	35	36
Morning, 9 a.m.–1 p.m.	28	16	5	13	16
Afternoon, 1 p.m.–7 p.m.	13	26	19	24	22
Evening, 7 p.m.–midnight	8	6	11	7	7
Night, midnight–6 a.m.	13	23	14	21	19
Prison section^(a)					
Arrivals section	0	10	0	8	6
Disciplinary section	0	7	5	6	5
Isolation	2	6	0	5	4
SMPR/UCSA	2	0	3	1	1
"Normal"	95	77	92	81	84
Place of event^(a)					
Individual cell	53	71	39	63	61
Shared cell	32	22	58	31	31
Two-person cell ^(b)	0	5	0	4	3
Other prison location	16	2	3	2	5
Person who made the discovery^(a)					
Guard	61	86	68	82	77
Cellmate	17	10	11	10	12
Other prisoner	7	0	3	1	2
Other	2	1	11	3	3
Unknown	12	3	8	4	6
Person who made the discovery (prisoners in shared cells)^(a)					
Guard	33	65	64	64	58
Cellmate	50	35	18	28	32
Other	8	0	14	6	6
Unknown	8	0	5	2	3

(a) Event in prison.
(b) The placement of two prisoners in one cell when one of them is at risk of suicide.
SMPR: *Service médico-psychologique régional* (regional medical and psychological service).
UCSA: *Unité de consultation et de soins ambulatoires* (consultation and ambulatory care unit).
Source: Authors' calculations based on data from the files archived at the French Ministry of Justice.

pénitentiaire),⁽³⁷⁾ 14% were in a detention centre (*centre de détention*),⁽³⁸⁾ and 4% in a high-security prison (*maison centrale*).⁽³⁹⁾ The distribution by institution type for prisoners who died due to violence is rather different. If we refine the table by distinguishing suicides from other violent deaths, we see that suicides usually take place in a remand prison (57% vs 42% of other violent deaths). Other violent deaths usually take place in a detention centre (16%) or penitentiary centre (39%). Prisoners who died from natural causes were also less likely to be in a remand prison (42%), which is consistent with the fact that they were often convicted criminals.

Excluding the cases of individuals hospitalized for a disease (23 cases), death was always preceded by an “event” (sudden discomfort, a fight, etc.). Most often, this involved “sudden discomfort”. The individual was found unconscious or in an abnormal state (in pain, vomiting, having a seizure, etc.). In a little over one in three cases, this “discovery” took place when the cells were opened up in the morning. This was particularly common for violent deaths other than suicides (51% of cases). For these individuals, therefore, quite a long time may have passed between the event that caused the death and the discovery of the death. However, it was not unusual for the alarm to be raised at night. This happened, for example, in one out of five violent deaths. The time at which the “event” was least likely to occur was in the evening, between 7 p.m. and midnight. In three-quarters of cases, the alarm was raised by a guard. Where the deceased was not alone in their cell, the alarm was raised by a cellmate in only one in three cases.

Claude (aged 40–49) had been in prison for ten years. He was found lifeless in his cell by a guard at around 7 a.m. The paramedics arrived half an hour later. He apparently died around 2 a.m. due to complications from heart disease.

Kamel (aged 30–39) had been imprisoned one year before. Several months after, he attempted suicide. A heavy drug user, he had a history of multiple massive medicinal poisonings. Around 6 p.m., while meals were being distributed, the guard realized that he and his cellmate were in a semi-comatose state. It was not uncommon to find these prisoners in this state, especially on the day when medications were handed out. Nevertheless, the guard raised the alarm. The emergency services and paramedics arrived, but death due to medicinal poisoning was recorded shortly after.

The event that caused death usually took place when the prisoner was in their cell. In over four out of five cases, this cell was in an ordinary section of the prison. This was slightly less often the case among prisoners who committed suicide: 10% were in the new arrivals section, 7% were in the disciplinary

(37) Includes at least two different detention regime units: remand prison, detention centre, and/or high-security prison.

(38) Houses the convicted criminals presenting the best potential for rehabilitation. The detention regime is primarily oriented towards the resocialization of prisoners.

(39) Houses the most problematic convicted criminals. The detention regime is mainly focused on security.

section, and 6% were in isolation. In 61% of cases, the individual had an individual cell, but this percentage varies significantly depending on cause of death. It is 71% for suicides, 53% for natural deaths, and only 39% for other violent deaths. Solitary confinement and the stress associated with disciplinary measures are known risk factors for suicide in detention (Duthé et al., 2014; Rabe, 2012; Way et al., 2007). However, not being alone in one's cell does not constitute absolute protection: 27% of individuals who committed suicide were sharing their cell with other detainees.

Conclusion and recommendations

Based on information collected from the Ministry of Justice files, this study shows the overwhelming preponderance of violent deaths in prisoner mortality. We were already aware of excess mortality from suicide among these individuals; now we can observe excess mortality from other violent causes, especially due to drug overdose and medicinal poisoning. Are these accidental overdoses or suicides? It is not usually possible to answer this question, but we cannot exclude the possibility that prison suicide figures may underestimate the reality. This is the conclusion reached by Chan Chee and Moutengou (2016). They believe that the prison service's figures should be adjusted by at least 6%. Insofar as some deaths from poorly defined or unknown causes could be overdoses, some of which constituted suicide, the required adjustment could be even more significant.

These violent deaths usually result in emergency situations. To avoid them, care must be rapidly provided. In our study, the emergency services arrived an average of 30 minutes after being notified, but this intervention time is variable. Providing the emergency services with access to prison premises often requires the opening of several security doors. Dedicated emergency doors, already operational in newer establishments, should be implemented throughout prison institutions. In addition, implementing 24-hour staffing of medical units (they are open only during the day) would mean faster access to medical care.

Prior to the provision of emergency care, there is also the question of how quickly the alarm is raised. The prison environment is unfavourable in this respect for various reasons. When prisoners are not alone in their cell, their cellmates are a priori the first to be able to raise the alarm.⁽⁴⁰⁾ However, this requires them to notice that anything is wrong. That it is commonplace to see prisoners in a "strange" state makes the rapid detection of emergency situations all the more unlikely. Neither the cellmates nor the guards are qualified to

(40) As part of a suicide prevention programme, a "supportive cellmate" scheme was tested across five prison institutions in 2010. The primary task of these cellmates, who were given first-aid training by the French Red Cross, was to listen to and identify prisoners who were troubled or suffering in some way. This scheme should be extended to all establishments with a capacity of more than 600.

assess the seriousness of an individual's state of health. The creation of a permanently staffed medical unit would enable better assessment of situations. Lastly, we believe it is important to note another result of the study. For half of deaths in the year 2011, the alarm was raised between midnight and 9 a.m. Night-time constitutes a risk period. Less up-close surveillance and longer time to access cells (only the senior prison officer has the keys) are obstacles to the rapid management of emergency situations.

Our study also reveals reduced natural-cause mortality among prisoners. Competition with violent causes does not seem sufficient to explain this. Using SSMRs is more likely to be significant. The improvements seen in prison healthcare since the 1994 reform must also contribute to this. As for suicides, the reduction in this type of mortality is no doubt associated with better prevention and faster management of health incidents.

Our final recommendation relates to the statistical monitoring of causes of death among prisoners. To obtain their statistics, Chan Chee and Moutengou had to reconcile INSERM's national statistics on causes of death with the records kept by the French prison service. This complex operation can only be done on limited occasions. The permanent monitoring of causes of death among prisoners using INSERM's statistics would involve each prisoner's penal status (whether inside or outside prison) being recorded on the death certificate. As an alternative, we recommend that ad hoc data collection, modelled on the collection performed for this study, should be done continuously as files on deceased individuals are opened. Comparison with Chan Chee and Moutengou's study shows that these data provide a satisfactory method of determining cause of death, with fewer unknown causes than in INSERM's national statistics. While ensuring that the information collected is consistent in all files, further information could certainly be extracted. This type of data collection would enable the monitoring of changes in mortality and causes of death over the long term and according to the sociodemographic and penal characteristics of the prisoners. For example, certain studies have shown the existence of a link between prison overcrowding and detainee mortality (Rabe, 2012). Incorporating contextual variables would highlight any discrepancies between institution types and clarify the effect of living conditions on the health of prisoners.

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APPENDIX

Table A.1. Sociodemographic characteristics of prisoners who died in 2011
(% of column)

	Death by cause				Total deaths (n = 246)	All prisoners
	Natural deaths (n = 68)	Violent deaths				
		Suicides (n = 123)	Other violent deaths (n = 55)	All		
Age group at death (years)						
Under 30	7	33	29	32	25	45
30–39	15	15	38	22	20	27
40–49	18	28	22	26	24	16
50–59	25	15	5	12	16	8
60 and over	35	8	5	7	15	4
Mean age	52.5	39.6	35.9	38.4	42.3	34.5
Sex						
Women	4	6	4	5	5	4
Men	96	94	96	95	95	96
Nationality (at imprisonment)						
France	85	83	87	84	85	82
European country (other than France)	6	8	0	6	6	5
Other country	9	9	13	10	9	13
Marital status (at imprisonment)						
Single	46	63	85	70	64	79
Divorced/separated	30	15	11	14	18	8
Married	17	20	4	15	16	12
Widowed	6	2	0	1	3	1
Level of education (at imprisonment)						
No academic qualification/illiterate	9	4	7	5	6	5
Primary	19	8	7	8	11	7
Lower secondary vocational	28	25	35	28	28	31
Secondary	19	30	38	33	29	32
Upper secondary	7	5	9	6	7	7
Higher education	3	11	0	8	7	3
Unknown	15	16	4	12	13	14
Employment status (at imprisonment)						
Unemployed: jobseeker	15	21	26	23	20	23
Employee	16	24	15	21	20	21
Other worker	3	2	2	2	2	6
Unemployed: no occupation	15	7	11	8	10	8
Retired	19	3	2	3	7	2
Disabled	3	2	7	4	4	1
Other non-worker	3	7	2	5	4	6
Unknown	26	33	35	34	32	32

Note: Figures weighted to take into account varying durations of exposure.
Source: Authors' calculations based on data from the files archived at the French Ministry of Justice except for the "All prisoners" column: data for the "2011 active population" from the FND.

**Table A.2. Penal characteristics of prisoners who died in 2011
(% of column)**

	Death by cause				Total deaths (n = 246)	All prisoners
	Natural deaths (n = 68)	Violent deaths				
		Suicides (n = 123)	Other violent deaths (n = 55)	All		
Time spent as a prisoner						
Under 1 month	3	19	15	17	14	1
1 month or over, but under 6 months	18	26	35	29	26	21
6 months or over, but under 1 year	16	17	13	16	16	27
1 year or over, but under 5 years	29	31	29	30	30	42
5 years and over	34	7	9	8	15	10
Primary offence						
Theft	10	20	36	25	21	22
Sexual assault	4	1	4	2	2	3
Road traffic offence	6	2	2	2	3	7
Homicide	32	30	11	24	26	9
ILE	0	0	2	1	0	1
ILS	6	2	15	6	6	17
Rape	25	24	7	19	20	9
Violence	9	15	15	15	13	10
Other	7	7	9	8	8	23
Criminal situation						
Detained	96	95	69	87	89	–
PE/PSE/SL	4	5	31	13	11	–
Criminal category						
Convicted	84	48	95	62	68	85
Under appeal	7	5	0	3	4	2
Pretrial detainee	9	47	5	34	27	13
Length of sentence (convicted detainees)						
Under 6 months	0	7	6	6	4	6
6 months or over, but under 1 year	7	7	19	13	11	10
1 year or over, but under 2 years	12	17	21	19	17	16
2 years or over, but under 5 years	18	31	31	31	26	32
5 years or over, but under 10 years	11	12	8	10	10	18
10 years and over	44	20	13	17	26	17
RCP	9	7	2	5	6	1

Table A.2 (cont'd). Penal characteristics of prisoners who died in 2011
(% of column)

	Death by cause				Total deaths (n = 246)	All prisoners
	Natural deaths (n = 68)	Violent deaths				
		Suicides (n = 123)	Other violent deaths (n = 55)	All		
Remaining sentence (convicted detainees)						
Less than one year	19	29	44	36	30	–
One year	26	24	29	26	26	–
More than one year	46	41	25	33	38	–
RCP	9	7	2	5	6	–
<p>Note: Figures weighted to take into account varying durations of exposure. ILE: <i>infraction à la législation sur les étrangers</i> (violation of legislation on foreigners). ILS: <i>infraction à la législation sur les stupéfiants</i> (drug offence). PE: <i>placement à l'extérieur</i> (outside placement). PSE: <i>placement sous surveillance électronique</i> (electronic monitoring). SL: <i>semi-liberté</i> (semi-custodial arrangement). RCP: <i>réclusion criminelle à perpétuité</i> (life sentence).</p> <p>Source: Authors' calculations based on data extracted from the files archived at the French Ministry of Justice except for the "All prisoners" column: data for the 2011 active population from the FND.</p>						

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Aline DÉSESQUELLES, Annie KENSEY, France MESLÉ • CIRCUMSTANCES AND CAUSES OF DEATH AMONG PRISONERS IN FRANCE: THE PREPONDERANCE OF VIOLENT DEATHS

This study provides a full table of the mortality of prisoners in France. It is based on the 246 files archived at the French Ministry of Justice for individuals who died in 2011. Seven out of ten deaths were violent, primarily suicides and drug overdoses or medicinal poisonings. The analysis confirms excess mortality from suicide among male prisoners compared with the general population, as well as excess mortality due to other violent causes. Conversely, natural-cause mortality is lower among male prisoners than for males in the general population. The use of suspensions of sentence for medical reasons partly explains this result. For a given age group, the perpetrators of serious offences present a higher risk of death, whether due to violence or natural causes, than the perpetrators of less serious offences. The risk of violent death is also higher among pretrial detainees than among convicts. The description of the circumstances of death highlights the need for better alert systems and improved management of health incidents, especially at night.

Aline DÉSESQUELLES, Annie KENSEY, France MESLÉ • CIRCONSTANCES ET CAUSES DES DÉCÈS DES PERSONNES ÉCROUÉES EN FRANCE : LE POIDS ÉCRASANT DES MORTS VIOLENTES

Cette étude présente un tableau complet de la mortalité des personnes placées sous écrou en France. Elle s'appuie sur les 246 dossiers archivés au ministère de la Justice relatifs aux personnes décédées en 2011. Sept décès sur dix sont des morts violentes, principalement des suicides et des surdoses ou intoxications médicamenteuses. L'analyse confirme la surmortalité par suicide des hommes sous écrou par rapport à la population générale, ainsi qu'une surmortalité due à d'autres causes violentes. Inversement, la mortalité par cause naturelle est plus faible pour les hommes sous écrou que pour ceux en population générale. L'octroi de suspension de peine pour raison médicale explique sans doute en partie ce résultat. À groupe d'âges donné, les auteurs d'infractions graves présentent un risque plus élevé de décéder, aussi bien de cause violente que de cause naturelle, que les auteurs de délits. Le risque d'une mort violente est aussi plus grand chez les prévenus que chez les condamnés. La description des circonstances des décès plaide en faveur de l'amélioration des dispositifs d'alerte et de prise en charge des incidents de santé, notamment la nuit.

Aline DÉSESQUELLES, Annie KENSEY, France MESLÉ • CIRCUNSTANCIAS Y CAUSAS DE MUERTE DE LAS PERSONAS ENCARCELADAS EN FRANCIA: EL FUERTE PESO DE LAS MUERTES VIOLENTAS

Este estudio presenta un cuadro completo de la mortalidad de la población encarcelada en Francia. Se apoya en 246 informes archivados en el Ministerio de Justicia relativos a las personas muertas en 2011. Siete muertes sobre diez son debidas a causas violentas, principalmente suicidios y sobredosis o intoxicaciones medicamentosas. El análisis confirma el exceso de mortalidad por suicidio respecto a la población general, así como una sobremortalidad por otras causas violentas. Inversamente, la mortalidad por causas naturales es más baja en los hombres encarcelados que en la población general. Probablemente, las suspensiones de peine por razones médicas explican en parte este resultado. En un mismo grupo de edad, los autores de infracciones graves corren un riesgo más grave de morir, tanto por causas violentas que por causas naturales, que los autores de delitos. El riesgo de una muerte violenta es también más elevado en los inculpados que en los condenados. La descripción de las circunstancias de la muerte abogan a favor de una mejora de los dispositivos de alerta y de tratamiento de los incidentes de salud, en particular durante la noche.

Keywords: prison, mortality, causes of death, suicide, violent deaths, France

Translated by Beatrice van Hoorn Alkema