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Counting the cost: estimating the number of deaths among recently released prisoners in Australia

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ABSTRACT

Objective: To estimate the number of deaths among people released from prison in Australia in the 2007–08 financial year, within 4 weeks and 1 year of release.

Design, participants and setting: Application of crude mortality rates for ex-prisoners (obtained from two independent, state-based record-linkage studies [New South Wales and Western Australia]) to a national estimate of the number and characteristics of people released from prison in 2007–08.

Main outcome measures: Estimated number of deaths among adults released from Australian prisons in 2007–08, within 4 weeks and 1 year of release, classified by age, sex, Indigenous status and cause of death.

Results: It was estimated that among people released from prison in 2007–08, between 449 (95% CI, 380–527) and 472 (95% CI, 438–507) died within 1 year of release. Of these, between 68 (95% CI, 56–82) and 138 (95% CI, 101–183) died within 4 weeks of release. Most of these deaths were not drug-related.

Conclusion: The estimated annual number of deaths among recently released prisoners in Australia is considerably greater than the annual number of deaths in custody, highlighting the extreme vulnerability of this population on return to the community. There is an urgent need to establish a national system for routine monitoring of ex-prisoner mortality and to continue the duty of care beyond the prison walls.
from custody between 1 January 1988 and 31 December 2002 (82 650). Information on deaths up to 31 December 2002 was obtained from the National Death Index.

For each state-based study, estimation of CMRs proceeded through the following steps:

- For each individual, the date of first release from custody during the follow-up period (the index release) was determined; follow-up periods of 4 weeks and 1 year were imposed from the date of index release, regardless of reimprisonment within these time frames.
- Within age, sex and Indigenous status strata, the number of deaths observed in the community within each period of observation was calculated. Deaths in custody were excluded.
- Within each stratum, total person-years (PY) of follow-up within each period of observation (irrespective of subsequent reimprisonment) was determined.
- Within each stratum and period of observation, a CMR was calculated as the observed number of deaths divided by PY of follow-up.

Estimating number of deaths nationally

To estimate the number of deaths nationally, within each stratum, we applied the corresponding CMRs from each state-based study to the estimated number of prison separations Australia-wide in 2007–08. Due to some small cell sizes (<10 PY of observation), some estimates within strata were unstable, so we aggregated observed data and computed estimates based on the relevant (observed) marginal totals.

RESULTS

The characteristics of the WA and NSW cohorts are summarised in Box 1. The NSW cohort was much larger, with more years of observation and more than seven times as many observed deaths. More than a third of the WA cohort was Indigenous, compared with 11% of the NSW cohort.

Observed CMRs for the NSW and WA cohorts are shown in Box 2, along with the corresponding estimated number of deaths among ex-prisoners who were released in Australia in 2007–08, within 1 year of release, by age, sex and Indigenous status. The estimated total number of deaths nationally based on data from the NSW (472) and WA (449) cohorts was similar, as were most estimates within evaluated strata. One exception was deaths among Indigenous ex-prisoners, with the NSW-based estimate (152) being 45% greater than the WA-based estimate (105). This reflected the greater observed CMR among Indigenous ex-prisoners in NSW (12.42 per 1000 PY) compared with WA (8.61 per 1000 PY).

For each state cohort, Box 3 shows the percentage of observed deaths within 1 year of release occurring in each month, by sex and Indigenous status. In WA, 33% of first-
year deaths occurred in the first month after release, with two-thirds of these (22% of the total) occurring among non-Indigenous men. The percentage of deaths was also higher in the first month after release in NSW, although only 15% of deaths in the first year after release occurred by this time. Again, two-thirds of these deaths (10% of the total) were among non-Indigenous men.

We also estimated the number of deaths occurring within 4 weeks of release. Based on data from the WA cohort, we estimated that 138 people released from prison in Australia during 2007–08 died within 4 weeks of release, most of whom were non-Indigenous, male and <40 years old. The NSW-based estimate was more conservative, with 68 ex-prisoners estimated to have died within 4 weeks of release. Most were non-Indigenous and male, but younger (<40 years). The observed all-cause CMR within 4 weeks of release in WA (35.60 per 1000 PY) was more than twice that observed in NSW (17.54 per 1000 PY), driven principally by larger observed CMRs in the WA cohort for non-Indigenous, male ex-prisoners aged ≥40 years.

The percentage of observed deaths in each cohort, within the first 4 weeks and 1 year after release, attributed to drug-related, natural and all other causes is shown in Box 5. In both jurisdictions, fewer than half of all deaths within 1 year after release were drug-related, although the percentage of drug-related deaths was higher among the NSW cohort in both the first year and the first 4 weeks. Conversely, the percentage of deaths due to natural causes was higher among the WA cohort.

**DISCUSSION**

Our study represents the most comprehensive attempt to date to estimate national mortality among recently released prisoners in Australia. We estimate that between 380 and 527 people released from prison in 2007–08 died within 1 year of release, with a disproportionate number dying in the first 4 weeks. These findings are consistent with...
a growing body of international literature demonstrating an elevated risk of death in ex-prisoners, particularly in the first few weeks after release and often due to drug-related causes.10-13,21-24

Although the two estimates of 1-year, all-cause mortality were similar, there were important differences between the two cohorts. First, the WA-based estimate of mortality in the first 4 weeks was more than double the NSW-based estimate, largely due to differing estimates of mortality for non-Indigenous men aged ≥ 40 years. There was also considerable heterogeneity in 1-year mortality estimates for Indigenous ex-prisoners, with the NSW-based estimate 45% greater than the WA-based estimate. Clearly, further research is required to understand the factors associated with risk of death after release and to inform targeted, jurisdiction-specific, preventive interventions.

Second, the proportion of drug-related deaths was considerably higher in the NSW cohort, particularly in the first 4 weeks. Possible reasons for this include the greater availability of heroin in NSW than in WA,24 and the smaller proportion of Indigenous ex-prisoners, who are less likely to inject drugs16 or die of drug-related causes,20 in the NSW cohort. Conversely, members of the WA cohort were more likely to die of natural causes, which may be related to the high incidence of chronic disease and other morbidities among Indigenous ex-prisoners in WA.27 A third possible explanation may relate to jurisdictional differences in coding causes of death, with deaths in the first 4 weeks more likely to be coded as “other injury and poisoning” or “unspecified” in the WA cohort (28.0%) than in the NSW cohort (6.7%). If these deaths were also considered to be drug-related, then the proportion of deaths in the first 4 weeks attributed to drug-related causes in NSW and WA would be similar.

Despite these jurisdictional differences, a large proportion of deaths in both cohorts was drug-related, highlighting the ongoing need to develop and implement evidence-based strategies to reduce drug-related death among ex-prisoners. One such strategy is opiate substitution therapy, which has been associated with reduced mortality, reincarceration and hepatitis C infection in ex-prisoners.28 Yet, despite unambiguous endorsement of opiate substitution therapy in the National Corrections Drug Strategy 2006–2009,29 its provision in Australian prisons remains inconsistent.16 Another suggested approach is the provision of naloxone for peer administration.30,31 A clinical trial of naloxone provision to those at risk of overdose on release from prison has been proposed23 but not yet conducted.

Although drug overdose is a leading cause of death for recently released prisoners, more than 50% of deaths in this study were not drug-related, and at least two-thirds of deaths in the first year occurred more than 1 month after release. These findings underscore the importance of moving beyond simplistic messages about reduced drug tolerance and overdose risk in the first few weeks of release,28 to build a more sophisticated, evidence-based approach to reducing mortality among ex-prisoners from multiple preventable causes over at least the first year after release.17 To be effective, preventive interventions must be multifaceted, cross-sectoral, tailored to the target group and, crucially, delivered both before and after release.14

Since the 1991 Royal Commission into Aboriginal Deaths in Custody,22 considerable attention has been devoted to monitoring deaths among Australian prisoners. According to the National Deaths in Custody Program, the annual number of prisoner deaths peaked at 76 in 1997, falling to 45 in 2007.33 Our estimates for ex-prisoners are considerably greater and indicate a need for a comparable system to monitor deaths among ex-prisoners. Because our estimates are a function of prison separations, the indirect estimation method used here is unsuitable for future monitoring purposes. One cost-effective method for such surveillance would be through routine, national linkage with the National Death Index, either as part of the new national minimum dataset for prisoner health,16 or to complement the National Deaths in Custody Program.33 There is growing recognition in Australia of the public health benefit of record linkage,36 and systems to protect the privacy of individuals are well established.35

Our study had several limitations, most of which would produce underestimation of mortality. First, by building on an already imperfect method (probabilistic record linkage), the estimates derived here have the same weaknesses as the original studies, including underascertainment of deaths due to failed linkage. The WA-based estimate is further compromised by linking only with state-based coronial records, thereby failing to detect deaths outside of WA. This is likely to produce systematic underestimation of deaths occurring with increased time after release from custody, which might explain the relatively greater proportion of deaths in the first month of release in the WA data.

Second, in the absence of available national data on prisoner releases, the number and demographic characteristics of those released were estimated. Built into this estimate is the imperfect assumption that the demographic profile of prison separations is the same as that of prisoners. Prison separations will over-represent those serving shorter sentences — that is, young people, Indigenous Australians and women.1 Given the lower CMRs observed among these groups, this would have produced underestimation of mortality. Third, because we did not consider deaths in custody or account for periods of remandment within the year following release, the incidence of mortality was underestimated and time “at risk” was overestimated, resulting in underestimation of CMRs.

Two limitations of our method would produce overestimation of mortality. First, the CMRs applied to 2007–08 prison separations were derived from deaths occurring between 1994 and 2003 in WA and between 1988 and 2002 in NSW. Preliminary data from a similar record-linkage study in Queensland suggest that the incidence of drug-related mortality among ex-prisoners declined significantly following the onset of a national heroin shortage in 2001.36 This may have produced overestimation of mortality, or at least of drug-related mortality. Second, in the absence of alternative data, we used an estimate of prison separations as a proxy for the number of people released from prison in 2007–08. Because some individuals are released from prison multiple times within a
year, this would have resulted in overestimation of the number of prisoners released in 2007–08, and thus overestimation of deaths. A final limitation is reliance on data from two states to estimate mortality at the national level. Although our two estimates of mortality were similar and indirect estimation methods such as these are used widely,37–39 we are unable to determine whether our findings would have been different if data from other jurisdictions had been included. Despite evidence that the differences between Australian states with respect to sociodemographic and health economic indicators are small,40 it would be desirable to combine data from a larger number of Australian jurisdictions or, ideally, conduct a study across all Australian jurisdictions. However, such linked data either do not currently exist or are not available outside these states.

Our study has produced the first national estimates of mortality among ex-prisoners in Australia, within 4 weeks and 1 year of release from custody. The annual number of deaths among recently released prisoners is far greater than the annual number of deaths in custody, highlighting the extreme vulnerability of this population on return to the community. There is an urgent need to establish a national system for routine monitoring of ex-prisoner mortality and to continue the duty of care beyond the prison walls for this vulnerable population.

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COMPETING INTERESTS
None relevant to this article declared (ICMJE disclosure forms completed).

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