

Mortality and morbidity in prisoners after release from prison in Western Australia 1995–2003

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The poor health of prisoners during imprisonment is well documented, but there have been few, if any studies into the longer term health prospects for prisoners after their release into the community. This research is the first to use linked administrative data to track the continuing health problems of and use of health services by prisoners in Western Australia before and after their imprisonment. The inter-relationship between social disadvantage, mental health problems and the poor physical health of many prisoners is a key theme emerging from the research. The analysis of the risk of morbidity and mortality demonstrates that female prisoners have a high risk of mental disorders and that Indigenous prisoners have multiple, long standing health issues, including those linked to alcohol and drug misuse. This research provides important empirical evidence of the high health needs of prisoners, particularly soon after release, and supports the allocation of resources for multiple and specific services both within and outside the prison system.

Toni Makkai
Director

Introduction

Many reports have described the relatively poor health of prisoners during imprisonment, emphasising high prevalences of mental disorders, addictive behaviours and infectious diseases including HIV-AIDS, hepatitis C and tuberculosis (Hammett, Harmon & Rhodes 2002; Martin, Colebrook & Gray 1984; White 2002). Fewer studies have examined the health of prisoners after release into the community because of the difficulty in maintaining long term contact with individuals who often have unstable living arrangements. The majority of such studies have focused on mortality because of the greater ease in identifying deaths as opposed to other health outcomes. This study was unable to find previous studies that have systematically documented the long term use of health services by representative cohorts of prisoners after release.

In Western Australia (WA) longitudinal studies of major health outcomes in cohorts of interest are possible through the Western Australian Data Linkage Study (WADLS), which enables information from core statistical health collections (including hospital separation abstracts, the Mental Health Services (MHS) register, and deaths) to be linked into cumulative person-based records (Holman et al. 1999). Cross-linkage of health information to records of cohorts of interest is possible, providing adequate identifying information is present. This facility has been used previously to document excess mortality in released prisoners in WA (Stewart et al. 2004). The objectives of the present study were to extend the analysis of mortality and to examine major causes of morbidity in released prisoners as reflected by hospital admissions and contacts with Mental Health Services.

Subjects and methods

Selected information from Department of Justice (DoJ) records was linked to health information extracted from the WADLS by the Data Linkage Unit in the Department of Health for all individuals released from prison at least once in the period 1995–2001 inclusive. In addition to age, gender and

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Indigenous status, this information included dates of imprisonment and release and a variable distinguishing between first-ever and subsequent imprisonments. The health data included all records of hospitalisation or MHS contacts for each prisoner from five years before the date of first release until the end of 2003 to provide at least two years of follow-up. The information extracted from health records included demographic details, dates of hospital admission and separation or clinic attendances and principal diagnosis coded according to Clinical Modification of the International Classification of Diseases, ninth revision (ICD-9-CM).

The follow-up period for each prisoner was estimated by subtracting the date of first release during the study period to date of death or to 31 December 2003. Periods of re-imprisonment were subtracted from the total to provide total days living in the community.

To compare age-adjusted risks of death and hospitalisation in prisoners with those in the general population, standardised mortality ratios (SMR) or standardised morbidity ratios (SMbR) were estimated using mortality data for WA or tabulations of total hospital admissions in WA provided by the Department of Health (J Codde, pers. comm. 2005). Separate estimates were made for male and female Indigenous and non-Indigenous prisoners. Additional estimates were made in which Indigenous and non-Indigenous prisoners were compared with the respective Indigenous and non-Indigenous populations of WA.

As individual prisoners could have multiple hospital admissions or contacts with MHS, separate estimates were made of the probability of individuals in the study cohort having at least one admission for selected diseases during the follow-up period and during the five years prior to the date of first release from prison.

The time to first admission to hospital after release was determined for selected conditions for each of the four demographic groups of prisoners using Kaplan-Meier survival analysis.

In addition to hospital or MHS contacts following the date of first release, a profile of pre-imprisonment morbidity was created by selecting hospital and mental health records for each prisoner during the five years preceding the date of first release in the study period.

Results

The study cohort included 13,667 individuals who were released from prisons in WA at least once in the six years 1995–2001. The average time of follow-up in the community, excluding further spells in prison, was 4.61 years. Male prisoners greatly outnumbered female prisoners who comprised only 11.7 percent of the total. Indigenous prisoners comprised 36.1 percent of the cohort. The mean and median ages of prisoners at the date of first release were 30 years and 28 years respectively (range 16–87 years). The median age of non-Indigenous female and male prisoners was 29 years compared with 27 years in Indigenous female and male prisoners.

Members of the study population underwent a total of 28,439 imprisonments of which 29.5 were first imprisonments. The number of times released ranged from one to 20 with the majority (56.9 percent) of prisoners being released once only. This varied from 73.0 percent in non-Indigenous female prisoners, to 65.3 percent in non-Indigenous male

prisoners, 56.0 percent in Indigenous female prisoners and 38.2 percent in Indigenous male prisoners. The mean number of releases in all prisoners was two per person, but varied from 2.76 and 2.07 respectively in Indigenous male and female prisoners to 1.78 and 1.61 in non-Indigenous male and female prisoners.

Mortality after release from prison

Released prisoners had substantially higher age-adjusted risks of death than the general population (Table 1). The relative differences were greater in those under 30 years of age and in females. In general, the highest relative risks of death were seen in Indigenous prisoners, but the differences between Indigenous and non-Indigenous prisoners were less when each was compared with the respective Indigenous population or non-Indigenous populations of WA. Especially notable was the 12-fold greater risk of death in non-Indigenous female prisoners aged 20–39 years. Deaths due to injury or poisoning or acute and chronic effects of alcohol or drug addiction accounted for over 60 percent of all deaths and much of the excess risk in mortality in released prisoners.

Separate analyses of the relationship between time from release and death found that the risk was four times greater in the first six months after release than the risk after one year. The excess risk in the first six months varied from

Table 1: Age and period standardised mortality ratios comparing released prisoners cohort with the general population in Western Australia, 1995–2003

Demographic sub-group	Age	No. of deaths	SMR ₁	95% CI	SMR ₂	95% CI
Indigenous female	20–39	21	9.13	(5.22, 13.03)	2.25	(1.29, 3.21)
	40–59	8	8.40	(2.58, 14.21)	1.79	(0.55, 3.02)
Non-Indigenous female	20–39	15	10.98	(5.42, 16.54)	12.43	(6.14, 18.73)
	40–59	5	3.20	(0.40, 6.01)	3.46	(0.43, 6.49)
Indigenous male	20–39	126	5.12	(4.22, 6.01)	1.50	(1.24, 1.76)
	40–59	56	6.20	(4.61, 7.80)	1.23	(0.91, 1.55)
Non-Indigenous male	20–39	155	4.17	(3.52, 4.83)	4.55	(3.83, 5.26)
	40–59	55	2.20	(1.62, 2.78)	2.37	(1.75, 3.00)

SMR = standardised mortality ratio

SMR₁ compares mortality in Indigenous and non-Indigenous male and female released prisoners with the total male and female populations of Western Australia

SMR₂ compares mortality in Indigenous and non-Indigenous male and female prisoners with the respective Indigenous and non-Indigenous populations of Western Australia

11 times greater in deaths related to alcohol and drug addiction, five times greater in deaths due to injury and poisoning, and three times greater for deaths due to all other causes. Multivariate analysis of risk factors for deaths found that the risk of death increased with age and was significantly higher in Indigenous prisoners and in those who had multiple imprisonments, in whom the risk of death was nearly twice as great as in those with only one imprisonment, with the risk increasing by 29 percent with each additional release.

Morbidity after and before release from prison

Variations in the probability of hospitalisation or MHS contacts after the date of first release were found to be similar in many respects to those for mortality. Released prisoners had substantially higher hospital admission rates or contacts with the MHS than the general population after adjusting for age (Table 2). In Indigenous male and female prisoners, rates of hospitalisation were over three times greater than in the general population after adjustment for age, while in non-Indigenous prisoners, they were nearly twice the expected rates in those aged 20–39 years and about 50 percent greater in those aged 40–49 years.

The greatest general differences in morbidity between prisoners and the general population of WA were seen with Indigenous prisoners. When compared respectively with the Indigenous or non-Indigenous populations, the magnitude of the differences in relative risk between Indigenous and non-Indigenous prisoners was reduced, reflecting the higher rates of hospitalisation in Indigenous people generally, compared with the non-Indigenous population of WA. Nevertheless, rates of hospital admissions for mental disorders and injury and poisoning were approximately twice as great in Indigenous male prisoners and three times as great in Indigenous female prisoners as in the Indigenous population of WA.

The relative risk of hospitalisation was highest for injury and poisoning and for mental disorders (which includes acute

Table 2: Risk of hospital admission in released prisoners compared with the population of Western Australia relative to standard morbidity ratios (SMbR_i)

Principal diagnosis	Age 20–39				Age 40–49			
	Indigenous		Non-Indigenous		Indigenous		Non-Indigenous	
	Male	Female	Male	Female	Male	Female	Male	Female
Infectious, parasitic disease	3.4	6.2	2.3	2.8	5.7	16.5	2.4	3.2
Cancer	3.8	2.5	0.9	0.6	2.6	1.5	0.4	0.8
Endocrine and nutrition	7.7	5.4	1.7	1.4	9.7	6.4	1.4	3.4
Blood disease	0.8	2.0	0.8	0.4	1.8	2.4	1.5	0.4
Mental disorder	5.6	6.6	4.6	5.8	6.9	6.5	4.8	2.6
Nervous system disease	5.1	2.5	1.4	1.7	9.1	3.9	1.2	2.3
Circulatory disease	3.2	3.2	1.0	0.6	4.0	7.4	1.3	1.5
Respiratory disease	5.2	7.7	1.0	0.9	15.5	11.1	1.8	1.7
Digestive disease	2.2	2.1	0.9	1.0	2.0	2.6	1.0	1.4
Genitourinary disease	1.3	1.7	1.0	1.2	1.5	1.5	1.0	1.0
Pregnancy related	0.0	1.9	0.0	1.4	0.0	1.0	0.0	0.8
Skin disease	4.7	11.4	1.8	3.2	7.0	5.1	2.2	2.9
Musculoskeletal disease	0.6	1.3	0.9	1.2	0.9	0.9	1.0	2.6
Ill-defined condition	3.1	2.6	1.5	1.5	3.6	5.2	1.6	1.5
Injury and poisoning	5.6	16.6	3.0	7.0	8.8	21.1	3.0	4.2
All causes	3.1	3.5	1.7	1.9	3.5	3.7	1.4	1.5

Note: Table 2 summarises SMbR_i for ages 20–39 and 40–49 by main chapters of ICD-9-CM, omitting chapters based on small numbers of admissions. Figures shown in bold are instances in which 95 percent confidence intervals around the estimated SMbR do not include unity and are therefore statistically significant at the five percent level or less

Relative risk was estimated from age standardised morbidity ratios (the ratio of the observed number of hospital admissions in released prisoners to the expected number in the general population after adjustment for age)

and chronic effects of alcohol and drug addiction). These disorders were also among the most common conditions leading to hospitalisation or MHS contacts (see Table 3). In the five years after first release, 31 percent of released Indigenous female prisoners and 24 percent of non-Indigenous female prisoners had at least one hospital admission or MHS contact for mental disorders. In released male prisoners the proportions in Indigenous and non-Indigenous prisoners were 18 percent and 17 percent respectively. In the case of admissions for injury, 38 percent of Indigenous female prisoners and 31 percent of Indigenous male prisoners had at least one hospital admission. For

non-Indigenous prisoners the respective figures were 12 percent and 16 percent.

In addition to injury and poisoning and mental disorders, Indigenous prisoners had high relative and absolute risks of hospitalisation for a wide range of health problems including infectious and parasitic disease, endocrine, cardiovascular, respiratory and skin diseases.

The risk of first health service contacts after the date of first release was greatest in the first year after admission and then progressively decreased up to six years after release (see Figure 1). Nearly half of all Indigenous female prisoners and 35 percent of non-Indigenous female prisoners were admitted to hospital at

least once in the first year after first release. For male prisoners the respective figures were 24 percent and 19 percent.

Levels and patterns of hospitalisation and contacts with MHS in the five years before date of first release were remarkably similar to those after the date of first release (average follow-up time of 4.6 years), as were variations by gender and Indigenous status. Moreover, hospital admissions or MHS contacts before first release were strongly predictive of hospital admission after release, particularly in those with previous admissions for poisoning (five-fold increase in risk of subsequent admission) or physical injury or mental problems (two-fold increase in risk). This trend was greater in those who had repeated imprisonments than those imprisoned once only and in non-Indigenous prisoners.

Discussion

The study has shown that after adjustment for age, gender and Indigenous status, released prisoners

have substantially higher risks of death and hospital admission than the general population. They also have high rates of hospital admission and contacts with MHS before imprisonment, which are strongly predictive of the use of such services after release and suggest that many of their health problems are long-standing. There are moreover, strong similarities between causes of death and hospitalisation. Suicide, drug and alcohol related and accidental poisoning were the leading causes of death and the principal reasons for hospital admission or contact with MHS before and after release.

These findings are consistent with other studies of mortality in released prisoners that have also found risks several times greater than in the general population. Other studies have also found that the risk of death is particularly high in the months immediately after release and have linked this to a return to illicit drug use (Harding-Pink 1990). Multiple imprisonment was associated with an increased risk of death or hospital admission, particularly for mental

problems and injury and poisoning as noted in other studies (Lovell, Gagliardi & Peterson 2002). This was particularly noticeable in non-Indigenous prisoners.

The high prevalence of mental problems demonstrated in this study is consistent with studies of prisoners in the United Kingdom. For example, a survey of mental health in prisoners conducted by the Office of National Statistics found that 14 percent of women and 10 percent of men on remand had experienced psychotic episodes in the previous year while 39 percent of men and 75 percent of women had significant neurotic symptoms, well above the prevalence found in household surveys using the same survey instrument. Even larger proportions (69 percent of women and 85 percent of men) admitted to ever using illicit drugs. Approximately 40 percent of women and 20 percent of men on remand reported receiving medical help for mental problems in the previous year. This is cited as a major reason for the recent transfer of prisoner health care from the Prison Service to the National Health Service to ensure equal standards of care in prisons and the general community (Brooke et al. 1996; Gulland, 2002; Maden, Swinton & Gull 1992). While such a radical change may not be considered appropriate in Australia, it emphasises the need for much closer cooperation between prison health services and mental health services to ensure continuity of treatment of prisoners with mental health problems after their release into the community.

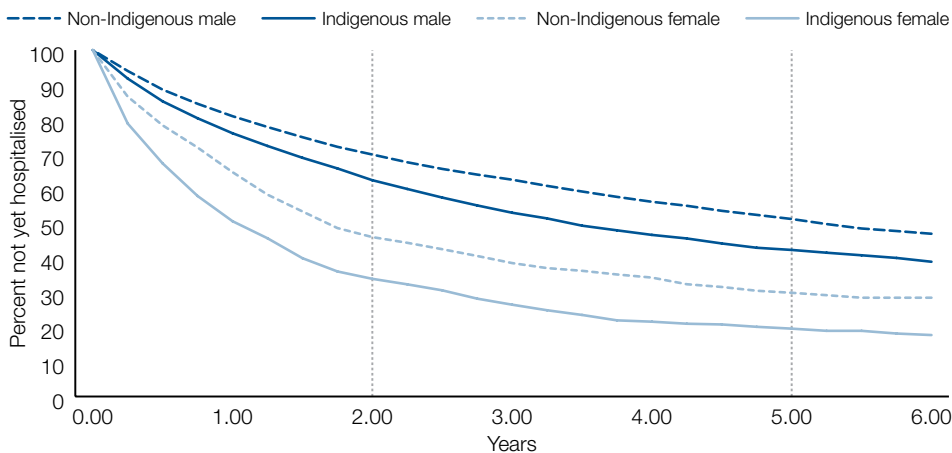
The problems in ensuring continuity of care and compliance with medication in prisoners with other chronic diseases such as tuberculosis and HIV-AIDS after release have been noted by other research workers (Fry et al. 2005). Others have stressed the need for effective discharge planning to ensure community linkage and continuity of care, especially in prisoners with multiple problems (Hammett, Roberts & Kennedy 2001).

A major finding of the present study is the greater risk of death and hospitalisation in Indigenous prisoners than the general population of WA. These differences are partly reduced when Indigenous prisoners are compared with the

Table 3: Summary of principal conditions leading to hospital admission of prisoners following first release

	Indigenous female %	Non-Indigenous female %	Indigenous male %	Non-Indigenous male %	All prisoners %
Female reproductive	38.5	36.5	NA	NA	37.6
Injury	38.2	11.9	31.3	16.5	22.3
Mental – GH or MHS	31.0	24.3	17.9	17.1	18.8
Mental – GH	17.2	14.4	8.8	11.4	11.2
Digestive	14.0	11.4	10.5	8.4	9.7
Other health care	28.7	11.3	8.3	5.9	8.4
Respiratory	17.2	4.2	10.7	3.4	6.6
Ill-defined symptoms	13.3	6.9	8.2	4.9	6.6
Skin	12.8	3.8	9.3	3.6	6.0
Musculoskeletal	5.6	5.3	4.1	6.5	5.8
Poisoning	7.8	11.0	3.2	5.2	5.1
CVD (not veins)	3.7	1.4	3.9	2.2	2.8
Genitourinary	9.6	3.0	2.2	2.0	2.7
Other injury/poison	3.5	2.1	2.9	2.2	2.5
Infections	5.4	2.5	2.7	1.9	2.4
Nervous system disease	4.4	3.2	3.4	1.5	2.4
Total number of released prisoners	887	740	4,419	7,891	13,667

GH = General Hospital; MHS = Mental Health Service; NA = not available; CVD = cardiovascular disease

Figure 1: Prisoners – time to first hospitalisation after release, percent


Indigenous population of WA of the same age, indicating that Indigenous prisoners share the well documented health disadvantages of Indigenous people generally (Gracey, Williams & Smith 2000; Watson, Ejueyitsi & Codde 2001). Studies elsewhere have stressed the importance of social disadvantage in early life on both ill-health and offending behaviour (Galea & Vlahov 2002). The relatively high prevalence of previous imprisonment in the Indigenous community may also contribute to the smaller gradient between released Indigenous prisoners and the general Indigenous population compared with the total population of WA. Notwithstanding these results, Indigenous prisoners are at greater risk of death or hospitalisation than the general Indigenous population. This is seen for a wide range of disease conditions, most of which are associated with social disadvantage.

The study found that female prisoners are at substantially greater risk of death and hospitalisation than male prisoners after release. Not only were female prisoners more likely to have multiple hospital admissions, they were also admitted to hospital much sooner after release than male prisoners. Non-Indigenous female prisoners had the highest rate of hospital admission for mental disorders and poisoning, while Indigenous female prisoners had the highest rates of admission for all other conditions. Of particular concern is that nearly 40 percent of Indigenous female prisoners had hospital admissions for injury with over one-third having

admissions for injury due to assault. This finding is consistent with a national study of Indigenous people that found that interpersonal violence accounted for 31 percent of admissions for injury in women and 50 percent in men (Moller, Dolinus & Cripps 1996). The same study found that compared with the non-Indigenous population, admissions due to interpersonal violence were 11 times greater in Indigenous male prisoners and probably many times greater in females, taking into account probable under-reporting of domestic violence in Indigenous women. In addition, female prisoners had higher rates of hospital admission for pregnancy and other conditions related to reproduction than women of the same age in the general population.

While women constitute only 11 percent of released prisoners, the extent of their health problems is of particular concern, particularly in view of the high prevalence of mental illness and attempted self-harm reported in female prisoners elsewhere (Anderson 2002; White, 2002). Anderson (2002) in particular has drawn attention to 'historical neglect' of the health of female prisoners and emphasised their special health needs.

Limitations and scope for further study

This study has several limitations and poses questions that can only be answered by further research. First, it does not take into account differences in the health of prisoners living in different

regions of the state, which may be particularly relevant for Indigenous prisoners.

Comparative studies have demonstrated marked regional differences in mortality and hospitalisation in the Indigenous population for the five most important health problems (cancer, diabetes, cardiovascular disease, respiratory disease, and injury and poisoning). As the current study may have over-generalised the health problems of released Indigenous prisoners, analysis of possible regional variation in prisoner health is required.

Comparisons of the risk of hospitalisation in prisoners compared with the general population depended on available tabulations of hospital admission rates in WA produced by the Epidemiology Department of the WA Department of Health. Age and sex specific rates for the Indigenous and non-Indigenous populations were available for broad chapters of the ICD only (Codde, pers. comm. 2005). More detailed examination of specific causes of hospitalisation, particularly for mental disorders and admissions for injury and poisoning should be considered in future studies.

Finally, the study has not attempted to relate mortality or morbidity to the nature of the offending behaviours that led to imprisonment, nor has it taken into account the effects of duration of imprisonment on health outcomes, which could lead to improved health outcomes in some instances and worse outcomes in others. It would be useful to compare health outcomes in persons who had drug-related offences with those imprisoned because of violent behaviour or a range of other offences.

Implications for policy

The current study has four major implications for preventive and clinical services for released prisoners:

- First, prisoners often have long term health problems predating imprisonment and probably originating in early life. This is consistent with the evidence linking both poor health status and criminal behaviour to social disadvantage.

Success in tackling ill-health in prisoners will ultimately depend on reducing the same social inequalities that lead to offending behaviour. This requires an ongoing commitment of governments to the reduction of social inequalities.

- The second issue is the importance of mental problems, including addictive behaviour and injury and poisoning as causes of both death and morbidity, and the strong link between these conditions and repeated imprisonment, as noted in other studies (Hartwell 2003). The successful long term management of such problems is difficult even under ideal conditions, but even more so in the uncertain social circumstances of released prisoners. Closer cooperation between prison health services and MHS is required to ensure both initiation of mental health programs in prison and continuity after release.
- Third, the higher risks of death and hospitalisation in Indigenous prisoners are of obvious concern. In the long term these can only be reduced by addressing social disadvantage that leads to chronic ill health. In the interim, the health problems need to be addressed through culturally appropriate health services, structured to ensure continuity of care on reentry into the community. In keeping with the recommendations of the Royal Commission into Aboriginal Deaths in Custody, this should involve Indigenous medical services wherever this is possible (Johnston 1991).
- Finally, while female prisoners account for only 11 percent of prisoners, they have extensive health problems that warrant special attention, and which

should recognise the different needs of Indigenous and non-Indigenous women. A careful review of the appropriateness of existing prison health services for women is required within the context of efforts to improve health services to prisoners in general.

Common to all of these problems is the need for adequate resources for careful assessment and management of health problems and careful release planning to ensure continuity of health care after release. Particular emphasis is required on the recognition and management of chronic health problems, whether of a physical or mental nature, and removal of structural barriers to continuity of care.

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