

**Predictors of post-sentence mental health service use in a population cohort  
of first time adult offenders in Western Australia**

**Short Title: Offenders' post-sentence mental health service use**

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## **Abstract**

**Background:** Little is known about whether or how offenders use mental health service (MHS) after sentence completion.

**Aims:** This study aimed to determine the likelihood of such service use by adult (18-44 years) first-time offenders up to five-years after sentence completion and possible predictor variables.

**Methods:** Pre-sentence and post-sentence MHS use was obtained from whole-population linked administrative data on 23,661 offenders. Cox proportional hazard models were used to determine which socio-demographic, offending and pre-sentence health service variables were associated with such post-sentence service use.

**Results:** The estimated five-year probability of any post-sentence MHS use was 12% for offenders who had not previously used such services, but still only 42% for those who had. For the latter, best predictors of post-sentence use were past psychiatric diagnosis and history of attempted self-harm; history of self-harm also predicted post-sentence use among new MHS users and so also did past physical illness. Indigenous offenders had greater likelihood of health service use for any mental disorder or for substance use disorders than non-Indigenous offenders, irrespective of pre-sentence use. Among those with pre-sentence service contact, imprisoned offenders were less likely to use MHSs after sentence than those under community penalties; in its absence, socio-economic disadvantage and residential accessibility were associated with greater likelihood of post-sentence use.

**Conclusion:** Our findings highlight the discontinuity of mental healthcare in most sentenced offenders, but especially prisoners, and suggest a need for better management strategies for these vulnerable groups with mental disorders.

## **Introduction**

Despite the enormous burden of mental illness in the offender population compared with the general population (Sirdifield et al., 2009; Australian Institute of Health and Welfare (AIHW), 2012a; Sodhi-Berry et al., 2014), little is known about their mental health service (MHS) use in the post-sentence period. The few whole-population studies on this examine prisoners exclusively and indicate high physical and psychiatric morbidity and mortality (Hobbs et al., 2006; Kariminia et al., 2007; Alan et al., 2011), with no published investigation on offenders serving community correction orders.

Untreated mental illness impacts negatively on both offenders and broader society in terms of disrupted lifestyle, few economic opportunities (Borzycki, 2005), high morbidity and mortality (Hobbs et al., 2006), increased reoffending (Lovell et al., 2002; Hsu et al., 2011), and diversion of public financial resources from avenues promoting social growth towards crime-containment activities. Stigma and issues related to access to community-based MHS facilities operating before sentence (Coid, 1988; Westerman, 2004) may be compounded for someone with a recent criminal conviction and, in the critical post-sentence period, hinder such service use (Burdekin, 1993; Lamb et al., 1999; Baillargeon et al., 2010). Hence, an understanding of the factors associated with MHS use by offenders after their initial contact with the criminal justice system is crucial to informing the planning and structuring of community-based MHS interventions, especially when mentally ill offenders are known to be reluctant to engage pro-actively with health services (Lamb et al., 1999; Andrews and Bonta, 2010).

Our aim was to describe the probability of MHS use over the five-year post-sentence period in a population cohort of adult (18-44 years) first-time offenders in Western Australia (WA) and the variables predictive of such use.

## **Methods**

### **Study population**

All 23,661 offenders aged 18-44 years (n=23,661) who commenced their first-ever (index) sentence in WA between 1<sup>st</sup> January 1985 and 31<sup>st</sup> December 1994 were included, whether on a community correction order or in one of WA's 13 prisons, except for those who died during sentence (n=78), or were still serving it (n=16) at the censor date, 31<sup>st</sup> December 2008.

## **Data sources**

Using the WA Data Linkage System (Holman et al., 1999), correctional records provided by the WA Department of Corrective Services were probabilistically linked (Kelman et al., 2002) to State-wide statutory health data collections namely, the Hospital Morbidity Data System for inpatient separations, the Mental Health Information System for public community psychiatric services and the Deaths Register. This linkage system is known to have a high sensitivity (95-99%) and specificity (98-99%) (Holman et al., 1999).

## **Ascertainment of outcomes and past history**

A MHS contact was defined as any public or private psychiatric inpatient admission or any public outpatient attendance. Presence of a diagnosed mental disorder was determined from the single diagnosis allocated among outpatients or the primary or any of the 21 secondary diagnostic fields in the hospital discharge records. In order to take into account changes in diagnostic classification over time (Morgan and Jablensky, 2010), all psychiatric diagnostic codes were coded according to the International Classification of Diseases, 9<sup>th</sup> Revision, Clinical Modification (ICD-9-CM), effective from 1988 to July-1999 which corresponded to the timing of most study events. The validity of the coded psychiatric diagnoses has been described elsewhere (Jablensky et al., 2005).

The five chosen outcomes were time to first MHS contact after the end of the index sentence for: (i) any mental disorder (ICD-9-CM-codes 290-319); (ii) psychotic disorders (295-298); (iii) substance use disorders (291, 292, 303-305); (iv) any other disorders (290, 293, 294, 299-302, 306-319) of insufficient frequency to allow individual analyses (Sodhi-Berry et al., 2014); and (v) attempted self-harm (external cause of injury codes: E950.0-E959.9, E980.0-E980.6). Follow-up for each outcome was censored at five years or on date of any further sentence (n=5,437, 23.0%), death (n=287, 1.2%), or on 31<sup>st</sup> December 2008 (n=8, <0.0%), whichever came first.

History of MHS use in the one-year and five-year pre-sentence periods was defined by MHS contacts during that time. For offenders with any such contact, the most recent pre-sentence psychiatric diagnosis according to ICD-9-CM codes (290-319) was designated as the past psychiatric diagnosis in a mutually exclusive hierarchy, with psychotic disorders taking precedence over substance use disorders, which were selected over other disorders (Wallace

et al., 1998; Lawrence et al., 2001). Similarly, a five-year pre-sentence history of physical illness was defined as any hospital admission for physical illness (ICD-9-CM-codes excluding 290-310 in the primary diagnosis field). Likewise, a five-year history of attempted self-harm was defined using the ICD codes described above.

### **Geographic accessibility and social disadvantage**

Social disadvantage was measured through the Index of Relative Socio-Economic Disadvantage (IRSD), a summary measure of the Socio-Economic Index for Areas (SEIFA) focusing on disadvantage in accessibility to education, employment and income (AIHW, 2012b). We used the IRSD quintiles ranging from most disadvantaged to least disadvantaged from the national census year (1986, 1991 or 1996) closest to the year of index offence. Geographical accessibility was measured via the Accessibility and Remoteness Index of Australia (ARIA) scores from the 1996 census which used road distances to 201 service centres to determine accessibility to goods and services considered standard in metropolitan areas (Department of Health and Aged Care, 2001). These enabled classification into highly accessible (ARIA scores: 0.00-1.84), accessible (1.84-5.80) and remote (5.80-12.00) categories. Residential postcode at the time of index sentence was used to determine both measures.

### **Offence type**

Offences were classified using the Australian and New Zealand Standard Offence Classification (ANZSOC) (Australian Bureau of Statistics (ABS), 1997). Where multiple offences accounted for the index sentence, the most serious crime was determined according to the National Offence Index (ABS, 2003); offenders were then classified as violent (ANZSOC codes: 0111- 0621) or non-violent (0711-1695).

### **Custodial setting and release type**

The index sentence was categorised simply as imprisonment or a community penalty. Offenders who had served part of their index sentence in both settings (n=1545, 6.5%) were included in the prisoner group, as performed elsewhere (Sodhi-Berry et al., 2014). Offenders could be released to freedom, conditionally (e.g., on bail or parole) or re-sentenced if they had reoffended or breached the sentence conditions.

Table 1: Demographic, first sentence characteristics, health history and follow-up details of the offender cohort (18-44 years) at end of first-ever sentence (expressed as a percentage of the number of people within each group)

Determinants	ALL	Indigenous females	Indigenous males	Non-Indigenous females	Non-Indigenous males	
Total number of offenders in each group:	23661	1015	3028	4220	15398	
Age at end of first sentence	18-19 years	14.3	14.8	23.7	10.2	13.5
	20-24 years	38.2	36.9	41.1	35.1	38.5
	25-29 years	18.4	18.4	16.3	20.2	18.3
	30-34 years	12.5	13.6	8.3	15.6	12.4
	35-39 years	9.1	10.0	5.7	10.1	9.4
	>=40 years	7.6	6.2	4.9	8.8	7.9
	Median (in years)	24.5	24.7	22.4	25.9	24.6
Mean (SD) (in years)	26.9 (7.2)	26.8 (6.9)	24.9 (6.5)	27.8 (7.3)	27.0 (7.3)	
ARIA category	Highly accessible	69.2	41	30.6	81.4	75.3
	Accessible	12.0	18.2	18.8	8.8	11.1
	Remote	11.8	37.4	45.7	4.1	5.6
	Missing	7.0	3.3	4.9	5.6	8.1
SEIFA category	Most disadvantaged	29.5	46.0	47.4	27.0	25.5
	More disadvantaged	18.7	20.6	18.4	19.6	18.5
	Average disadvantaged	14.0	13.1	12.7	14.5	14.2
	Less disadvantaged	10.8	7.5	6.7	11.4	11.7
	Least disadvantaged	19.5	9.4	9.4	21.8	21.6
	Missing	7.5	3.4	5.4	5.7	8.6
Offence type	Violent	27.6	33.0	44.7	15.3	27.3
	Non-violent	72.4	67.0	55.3	84.7	72.7
Order type	Prison order	22.6	25.3	37.6	7.0	23.7
	Community correction order	77.4	74.7	62.4	93.0	76.3
Release type	Released to freedom	79.8	77	75.2	86.9	79
	Conditional release	6.0	2.5	6.9	2.3	7.0
	Other release	14.2	20.5	17.9	10.9	14.0
Duration of first sentence	< 0-5 year	27.9	36.0	43.0	21.6	26.1
	0-5-1 years	27.2	30.1	22.6	33.8	26.1
	1-1-5 years	17.8	16.5	15.2	20.0	17.8
	1-5-2 years	11.8	9.9	8.2	12.1	12.6
	> 2 years	15.3	7.6	11.0	12.6	17.3
	Median (in years)	1.0	1.0	0.7	1.0	1.0
	Mean (SD) (in years)	1.2 (1.1)	0.9 (0.7)	0.9 (1.0)	1.1 (0.8)	1.2 (1.1)
5-year h/o MHS use	No MHS use in 0-5 years	84.4	78.1	86.9	79.2	85.7
	Used MHS in 0-1 year	8.2	9.7	6.5	11.1	7.6
	Used MHS in 1-5 years	7.4	12.2	6.7	9.7	6.6
Past psychiatric diagnosis (5-year)	Psychotic disorders	1.3	0.8	0.7	1.4	1.5
	Substance disorders	8.7	16.2	10.4	9.5	7.6
	Other disorders	5.6	4.9	2.0	9.9	5.1
5-year h/o other health service use	Attempted self-harm	4.6	7.9	2.8	8.5	3.6
	Physical illness	43.6	79.7	45.8	60.2	36.3
Reasons for censored follow-up time	Died	1.2	1.2	1.5	0.7	1.3
	Re-sentenced	23.0	32.4	47.6	13.4	20.2
	Complete five year follow-up	75.8	66.4	51.0	85.9	78.5
Follow-up time	Mean (SD) (in years)	4.2 (1.6)	3.9 (1.8)	3.3 (2.0)	4.5 (1.3)	4.3 (1.5)

h/o: Pre-sentence history of; MHS: Mental Health Service; SD: Standard Deviation

## **Statistical analyses**

Cohort characteristics were described using standard descriptive statistics for four gender-race groups: Indigenous and non-Indigenous women and Indigenous and non-Indigenous men. Pre-sentence use of health services was described using proportions (percentages).

Kaplan-Meier estimates of probability of MHS use for all outcomes (any mental disorder, psychotic disorders, substance use disorders, other disorders and attempted self-harm) over the five years after the index sentence were calculated for the full cohort and separately for offenders with (n=3,694, 15.6%) and without (n=19,967, 84.4%) any five-year pre-sentence MHS contact.

Cox proportional hazards regression models were used to determine the association between the outcomes of interest and potential predictors including socio-demographic variables (gender-race group, age, ARIA, SEIFA), characteristics of the index sentence (nature of offence, custodial setting, duration of index sentence) and pre-sentence health history (mental and physical illness and attempted self-harm) measured at start of index sentence. All statistical analyses were performed using SAS version 9.3.

## **Ethics**

This study was approved by the Research and Evaluation Committee of the Department of Corrective Services (Reference Number: 2006/00276), and the Human Research and Ethics Committees of the Department of Health (Reference Number: 200623) and The University of Western Australia (Reference Number: RA/4/1/1347).

## **Results**

### **The cohort at sentence commencement (baseline)**

Table 1 shows that most offenders were non-Indigenous (n=19,618, 82.9%), men (n=18,426, 77.9%), highly disadvantaged socio-economically (n=11,403, 48.2%), living in highly accessible areas (n=16,370, 69.2%), convicted of non-violent offences (n=17,130, 72.4%), sentenced to community correction orders (n=18,312, 77.4%), were unconditionally released (n=18,890, 79.8%) and had a full five-year follow-up (n=17,929, 75.8%). The mean age at completion of index sentence was 26.9 years (SD=7.2), and the mean duration of index sentence was 1.2 years (SD=1.1).

Table 2: Five-year probability of post-sentence mental health service contact for various psychiatric disorders in sub-groups of adult offenders (18-44 years) (expressed as a percentage)

Groups	Outcomes	All offenders					Indigenous females					Indigenous males					Non-Indigenous females					Non-Indigenous males				
		All	Vio	Nvio	Pri	Com	All	Vio	Nvio	Pri	Com	All	Vio	Nvio	Pri	Com	All	Vio	Nvio	Pri	Com	All	Vio	Nvio	Pri	Com
Total offenders at risk:		23661	6531	17130	5349	18312	1015	335	680	257	758	3028	1355	1673	1140	1888	4220	644	3576	297	3923	15398	4197	11201	3655	11743
All offenders (N= 23,661)	Any Mental Disorder	16.8	19.1	15.9	15.3	17.2	33.1	35.8	31.7	35.1	32.5	22.6	23.8	21.5	23.0	22.3	20.0	24.2	19.3	16.9	20.3	14.1	15.9	13.3	12.3	14.6
	Psychotic Disorders	3.1	3.7	2.8	2.4	3.3	3.2	2.2	3.7	2.9	3.3	1.9	2.0	1.7	1.6	2.0	3.0	4.6	2.7	3.1	2.9	3.3	4.1	3.0	2.5	3.6
	Substance use Disorders	12.0	13.7	11.3	11.8	12.0	29.1	31.3	27.9	31.4	28.4	20.6	21.3	20.0	21.3	20.2	12.2	14.0	11.9	8.3	12.5	9.6	10.5	9.3	8.7	9.9
	Other Disorders	7.5	8.1	7.3	5.4	8.1	9.7	10.2	9.4	8.5	10.0	4.6	4.8	4.5	4.4	4.8	11.6	16.5	10.7	9.4	11.8	6.7	7.5	6.3	5.0	7.2
	Attempted Self-harm	3.3	3.7	3.1	2.4	3.5	6.9	5.1	7.8	6.4	7.0	2.6	3.5	1.8	3.1	2.3	4.4	6.5	4.0	1.8	4.6	2.8	3.2	2.7	2.0	3.1
Pre-sentence MHS contact present (N= 3,691)	Any Mental Disorder	42.4	45.0	41.2	39.6	43.1	60.3	52.7	64.7	68.9	57.7	51.5	55.4	47.8	56.9	48.7	44.7	54.6	42.2	36.4	45.4	38.5	39.8	37.9	34.0	39.9
	Psychotic Disorders	11.7	12.8	11.2	9.3	12.3	7.1	1.2	10.7	8.3	6.8	8.5	10.6	6.4	7.6	8.9	9.4	12.7	8.5	11.5	9.2	13.7	14.8	13.2	9.7	15.0
	Substance use Disorders	29.7	32.2	28.5	30.6	29.5	55.3	50.0	58.4	63.7	52.7	45.1	47.5	42.8	52.5	41.5	28.0	31.8	27.0	15.7	28.9	25.6	27.3	24.8	24.8	25.9
	Other Disorders	22.3	22.6	22.1	15.5	24.0	20.0	14.9	23.1	17.4	21.0	14.6	12.9	16.3	13.7	15.0	28.5	41.6	25.2	21.6	29.0	21.0	20.8	21.2	15.0	22.9
	Attempted Self-harm	10.2	10.2	10.2	7.5	10.9	14.9	6.1	20.1	12.6	15.5	6.9	7.7	6.3	7.0	6.9	12.5	18.9	10.9	5.0	13.1	9.2	9.0	9.3	7.4	9.8
Pre-sentence MHS contact absent (N= 19,967)	Any Mental Disorder	12.2	13.5	11.7	11.3	12.4	25.2	30.3	22.5	25.1	25.3	18.4	19.0	17.8	18.8	18.2	13.8	13.2	13.9	11.8	14.0	10.1	11.1	9.8	8.8	10.6
	Psychotic Disorders	1.5	1.7	1.5	1.2	1.6	2.1	2.4	1.9	1.5	2.2	0.9	0.7	1.1	0.9	0.9	1.3	1.6	1.3	0.9	1.4	1.6	2.0	1.5	1.3	1.7
	Substance use Disorders	8.8	9.8	8.4	8.7	8.8	21.5	25.4	19.5	21.9	21.4	17.0	17.3	16.8	17.4	16.8	8.2	7.6	8.3	6.4	8.4	7.0	7.1	7.0	6.1	7.3
	Other Disorders	4.9	5.0	4.8	3.7	5.2	6.7	8.7	5.7	6.1	6.9	3.2	3.6	2.8	3.3	3.2	7.4	7.4	7.4	6.4	7.5	4.4	4.9	4.2	3.5	4.7
	Attempted Self-harm	2.0	2.3	1.9	1.6	2.2	4.6	4.8	4.5	4.7	4.5	2.0	2.8	1.2	2.6	1.6	2.4	2.0	2.4	0.9	2.5	1.8	2.0	1.7	1.2	2.0

Vio: Violent; Nvio: Non-violent; Pri: Prison; Com: Community Corrections

Only 1,940 (8.2%) and 3,691 (15.6%) offenders had a MHS contact up to one year or five years before their index sentence, respectively. Substance use disorder were the most common five-year diagnosis (n=2,057, 8.7%) in all gender-race groups. Over the five years prior to sentence, 1,085 (4.6%) had been admitted to hospital for self-harm and 10,322 (43.6%) for physical illness.

**Five-year (unadjusted) likelihood of MHS use**

The estimated five-year post-sentence probability of any MHS contact was 16.8% overall, being much higher (42.4%) for offenders with a pre-sentence history of such service use than those without (12.2%) (Table 2). Table 2 also shows that regardless of any pre-sentence MHS contact, non-Indigenous men were least likely to make use of such services, followed by, followed by non-Indigenous women, then Indigenous men, with Indigenous women having the highest proportion of users (range: 38.5% in non-Indigenous men to 60.3% in Indigenous women with prior MHS contact; 10.1% in non-Indigenous men to 25.2% in Indigenous women without a previous contact). The probability was greatest for substance use disorders, followed by other disorders, attempted self-harm and psychotic disorders, irrespective of pre-sentence MHS contact (Figure 1).

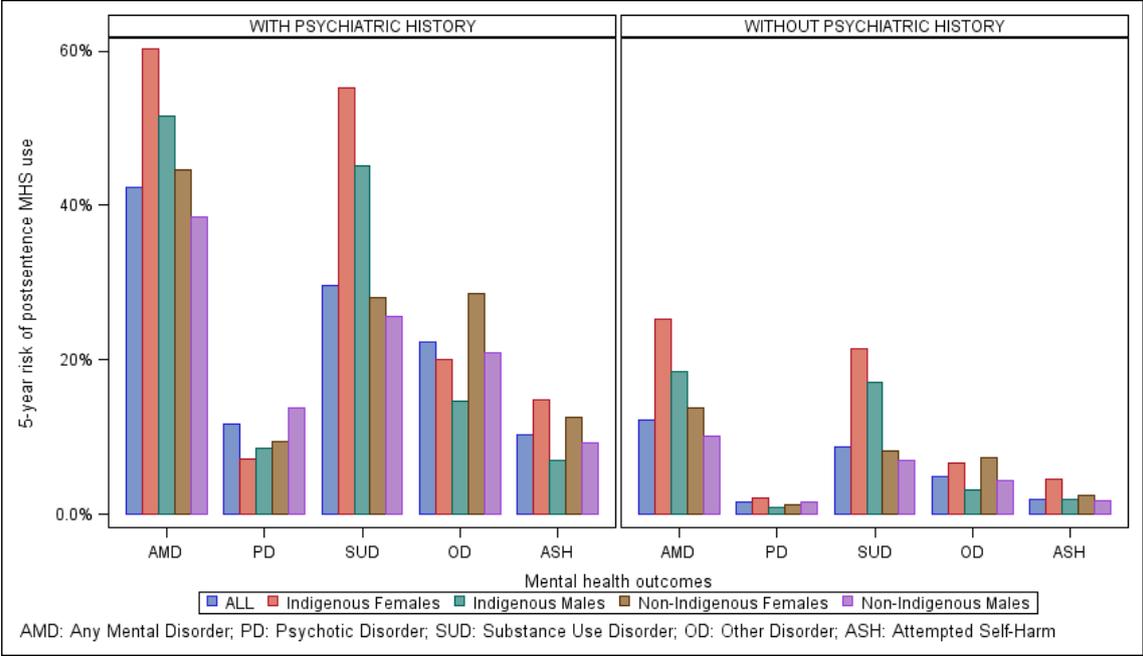


Figure 1: Five-year unadjusted probability of post-sentence MHS use by adult (18-44 years) offenders

## **Predictors of post-sentence MHS use**

Tables 3 and 4 show the variables associated with post-sentence MHS contacts. Past psychiatric diagnosis was the strongest potential predictor of any post-sentence MHS use among offenders with a pre-sentence MHS contact (Table 3). Offenders with a pre-sentence diagnosis of psychotic disorders were over three times more likely to have a post-sentence MHS contact than offenders with non-psychotic disorders. Timing of pre-sentence contact was also important, with contact in the 12 months before the index sentence being nearly twice as likely to be associated with post-sentence MHS contact for all mental disorders.

Pre-sentence history of physical illness was a strong predictor for all post-sentence MHS outcomes (HRs 1.5-1.7) among offenders without any previous MHS contact (Table 4), but not among those who did have any contact at all. Pre-sentence history of attempted self-harm was also a strong determinant of all outcomes except psychotic disorders irrespective of pre-sentence MHS contact.

Demographic group was also significantly associated with all outcomes. Irrespective of pre-sentence MHS contact, Indigenous offenders were more likely to have made some post-sentence use of services for any mental disorder, including substance use disorders; non-Indigenous women were more likely to have contact for 'other disorders' compared with non-Indigenous men. Furthermore, among offenders with a pre-sentence MHS contact, all demographic groups were equally likely to have post-sentence MHS contacts for attempted self-harm ( $p > 0.05$ ), but Indigenous women without pre-sentence contact were twice as likely to attempt self-harm after sentence than non-Indigenous men.

Overall, among offenders without a pre-sentence MHS contact, 18-19 year olds had a higher probability of attempted self-harm than older people and those from highly disadvantaged areas were between 1.2-1.3 times more likely to have post-sentence MHS contacts for any mental disorder and/or substance use disorders; those from highly accessible areas were more likely to have had post-sentence MHS contacts than their respective reference groups.

Offenders with sentences of six months or less were more likely than those with longer sentences to use MHSs for any mental disorder after sentence completion if they had a pre-sentence MHS contact but less likely to do so if they did not have such a contact history. Nature of offending (violent or non-violent), however, did not affect such contact.

Table 3: Multifactorial analysis of all predictor variables in adult offenders (18-44 years) with a pre-sentence history of mental health service contact (Hazard Ratios)

Parameter	Group	Any mental disorder	Psychotic disorders	Substance use disorders	Other disorders	Attempted self-harm
Number of offenders with outcome:		1377 / 3691	381 / 3691	938 / 3691	703 / 3691	316 / 3691
Demographic group (REF: Non-Indigenous males)	p-value	‡	*	‡		
	Indigenous females	1.8 ‡ (1.4 - 2.2)	0.9 (0.5 - 1.6)	2.1 ‡ (1.7 - 2.7)	1.2 (0.8 - 1.6)	1.4 (0.9 - 2.2)
	Indigenous males	1.4 † (1.1 - 1.7)	0.8 (0.5 - 1.4)	1.7 ‡ (1.4 - 2.1)	0.9 (0.6 - 1.2)	0.9 (0.5 - 1.4)
	Non-Indigenous females	1.1 (1.0 - 1.3)	0.7 ^ (0.5 - 0.9)	1.1 (0.9 - 1.3)	1.2 * (1.0 - 1.4)	1.1 (0.9 - 1.4)
ARIA category (REF: Remote)	p-value					
	Highly accessible	1.2 (1.0 - 1.5)	1.5 (0.9 - 2.5)	1.1 (0.9 - 1.4)	1.2 (0.9 - 1.7)	1.2 (0.7 - 1.8)
	Accessible	1.1 (0.9 - 1.4)	1.6 (0.9 - 2.9)	1.1 (0.8 - 1.4)	1.1 (0.7 - 1.6)	1.2 (0.7 - 2.0)
SEIFA category (REF: Least disadvantaged)	p-value	*	^			
	Most disadvantaged	1.3 ^ (1.1 - 1.5)	1.2 (0.9 - 1.6)	1.2 (1.0 - 1.4)	1.1 (0.9 - 1.4)	1.6 * (1.1 - 2.2)
	More disadvantaged	1.1 (0.9 - 1.3)	0.8 (0.5 - 1.1)	0.9 (0.8 - 1.2)	1.1 (0.9 - 1.4)	1.2 (0.8 - 1.8)
	Average disadvantaged	1.1 (0.9 - 1.3)	1.0 (0.7 - 1.4)	1.0 (0.8 - 1.2)	1.0 (0.8 - 1.3)	1.4 (0.9 - 2.1)
	Less disadvantaged	1.0 (0.8 - 1.2)	0.7 * (0.4 - 1.0)	0.9 (0.7 - 1.1)	1.0 (0.8 - 1.4)	1.2 (0.8 - 1.9)
Age group at end of first sentence (REF: 18-19 years)	p-value	*		*		
	≥40 years	1.1 (0.9 - 1.5)	1.4 (0.7 - 2.5)	1.1 (0.8 - 1.5)	0.9 (0.6 - 1.4)	0.8 (0.4 - 1.4)
	35-39 years	1.3 * (1.0 - 1.7)	1.7 (1.0 - 3.1)	1.2 (0.9 - 1.6)	1.4 * (1.0 - 2.0)	1.1 (0.6 - 1.7)
	30-34 years	1.3 * (1.0 - 1.7)	1.9 * (1.1 - 3.3)	1.3 * (1.0 - 1.7)	1.3 (0.9 - 1.8)	1.0 (0.6 - 1.6)
	25-29 years	1.1 (0.9 - 1.4)	1.7 (1.0 - 3.0)	1.0 (0.8 - 1.4)	1.2 (0.9 - 1.7)	1.2 (0.8 - 1.9)
	20-24 years	1.1 (0.9 - 1.3)	1.6 (0.9 - 2.7)	1.0 (0.8 - 1.3)	1.1 (0.8 - 1.6)	1.0 (0.6 - 1.5)
Nature of offence	p-value					
	Violent vs. Non-violent	1.1 (1.0 - 1.2)	1.0 (0.8 - 1.2)	1.1 (1.0 - 1.3)	1.1 (0.9 - 1.3)	1.1 (0.8 - 1.4)
Custodial setting	p-value	*			‡	
	Prison vs. Com correction	0.8 * (0.7 - 1.0)	0.8 (0.6 - 1.0)	0.9 (0.7 - 1.0)	0.7 † (0.5 - 0.8)	0.7 (0.5 - 1.0)
Length of first sentence (REF: 0-0.5 years)	p-value	^		‡		
	>2 years	0.8 * (0.7 - 1.0)	1.1 (0.8 - 1.6)	0.7 ^ (0.6 - 0.9)	0.8 (0.6 - 1.0)	0.7 (0.5 - 1.1)
	1.5-2 years	0.7 † (0.6 - 0.9)	0.8 (0.6 - 1.2)	0.6 ‡ (0.5 - 0.7)	0.7 * (0.6 - 1.0)	0.7 (0.4 - 1.0)
	1-1.5 years	0.8 (0.7 - 1.0)	0.9 (0.6 - 1.2)	0.8 (0.7 - 1.0)	1.0 (0.8 - 1.3)	1.0 (0.7 - 1.5)
	0.5-1 year	0.8 ^ (0.7 - 0.9)	1.0 (0.7 - 1.4)	0.8 ^ (0.6 - 0.9)	0.8 (0.7 - 1.1)	0.9 (0.7 - 1.3)
5-year h/o physical illness	p-value					
	Yes vs. No	1.1 (0.9 - 1.3)	0.8 (0.7 - 1.1)	1.2 (1.0 - 1.4)	1.1 (0.9 - 1.3)	1.1 (0.8 - 1.5)
5-year h/o attempted self-harm	p-value	‡		‡	‡	‡
	Yes vs. No	1.3 ‡ (1.2 - 1.5)	1.2 (1.0 - 1.6)	1.5 ‡ (1.3 - 1.7)	1.7 ‡ (1.4 - 2.0)	3.0 ‡ (2.4 - 3.9)
5-year h/o MHS use	p-value	‡	‡	‡	‡	†
	0-1 year vs. 1-5 years	1.7 ‡ (1.5 - 1.9)	2.4 ‡ (1.9 - 3.1)	1.6 ‡ (1.4 - 1.8)	1.9 ‡ (1.7 - 2.3)	1.5 † (1.2 - 2.0)
Past psychiatric diagnosis (REF: Other disorders)	p-value	‡	‡	‡	‡	*
	Psychotic disorders	3.2 ‡ (2.7 - 3.8)	10.5 ‡ (8.2 - 13.5)	1.3 (1.0 - 1.7)	1.2 (1.0 - 1.5)	1.6 ^ (1.1 - 2.4)
	Substance use disorders	1.0 (0.9 - 1.2)	0.6 † (0.4 - 0.8)	2.0 ‡ (1.7 - 2.3)	0.5 ‡ (0.4 - 0.6)	1.0 (0.8 - 1.3)

h/o: Pre-sentence history of; REF: Reference group; na: not applicable; \*: p<0.05; ^: p<0.01; †: p<0.001; ‡: p<0.0001

Table 4: Multifactorial analysis of all predictor variables in adult offenders (18-44 years) without a pre-sentence history of mental health service contact (Hazard Ratios)

Parameter	Group	Any mental disorder	Psychotic disorders	Substance use disorders	Other disorders	Attempted self-harm
Number of offenders with outcome:		2109 / 19967	262 / 19967	1516 / 19967	835 / 19967	351 / 19967
Demographic group (REF: Non-Indigenous males)	p-value	‡	*	‡	‡	^
	Indigenous females	2.2 ‡ (1.8 - 2.6)	1.0 (0.6 - 1.8)	2.6 ‡ (2.1 - 3.1)	1.3 (0.9 - 1.8)	2.2 † (1.5 - 3.4)
	Indigenous males	1.8 ‡ (1.6 - 2.1)	0.5 * (0.3 - 0.9)	2.4 ‡ (2.1 - 2.8)	0.8 (0.6 - 1.1)	1.2 (0.8 - 1.8)
	Non-Indigenous females	1.2 ^ (1.1 - 1.4)	0.7 (0.5 - 1.0)	1.0 (0.9 - 1.2)	1.5 ‡ (1.3 - 1.8)	1.2 (0.9 - 1.5)
ARIA category (REF: Remote)	p-value	‡				^
	Highly accessible	1.3 ^ (1.1 - 1.5)	1.3 (0.8 - 2.1)	1.2 * (1.0 - 1.4)	1.4 ^ (1.1 - 1.9)	2.0 ^ (1.3 - 3.0)
	Accessible	1.1 (0.9 - 1.3)	1.3 (0.7 - 2.2)	1.1 (0.9 - 1.3)	1.3 (0.9 - 1.7)	1.4 (0.9 - 2.4)
SEIFA category (REF: Least disadvantaged)	p-value	^		^		
	Most disadvantaged	1.3 ‡ (1.1 - 1.5)	1.3 (0.9 - 1.8)	1.3 † (1.1 - 1.5)	1.1 (0.9 - 1.4)	1.2 (0.9 - 1.7)
	More disadvantaged	1.2 * (1.0 - 1.3)	1.0 (0.7 - 1.5)	1.2 * (1.0 - 1.4)	1.0 (0.8 - 1.3)	1.2 (0.9 - 1.7)
	Average disadvantaged	1.1 (1.0 - 1.3)	1.0 (0.7 - 1.5)	1.1 (1.0 - 1.4)	1.0 (0.8 - 1.3)	1.2 (0.8 - 1.7)
	Less disadvantaged	1.1 (0.9 - 1.3)	1.0 (0.6 - 1.6)	1.1 (0.9 - 1.3)	0.9 (0.7 - 1.2)	1.0 (0.7 - 1.5)
Age group at end of first sentence (REF: 18-19 years)	p-value					*
	>=40 years	1.2 (1.0 - 1.5)	1.0 (0.5 - 1.7)	1.2 (0.9 - 1.5)	1.2 (0.9 - 1.7)	0.5 ^ (0.3 - 0.8)
	35-39 years	1.2 (1.0 - 1.4)	1.0 (0.6 - 1.7)	1.2 (0.9 - 1.4)	1.2 (0.9 - 1.5)	0.7 (0.4 - 1.0)
	30-34 years	1.1 (0.9 - 1.3)	1.0 (0.6 - 1.6)	1.2 (1.0 - 1.4)	0.9 (0.7 - 1.3)	0.6 * (0.4 - 0.9)
	25-29 years	1.0 (0.9 - 1.2)	0.9 (0.6 - 1.5)	1.0 (0.8 - 1.2)	1.0 (0.8 - 1.4)	0.6 * (0.4 - 0.9)
	20-24 years	1.0 (0.9 - 1.2)	1.1 (0.7 - 1.7)	1.0 (0.9 - 1.2)	0.9 (0.7 - 1.2)	0.7 ^ (0.5 - 0.9)
Nature of offence	p-value					
	Violent vs. Non-violent	1.1 (1.0 - 1.2)	1.2 (0.9 - 1.6)	1.0 (0.9 - 1.1)	1.1 (1.0 - 1.3)	1.2 (1.0 - 1.6)
Custodial setting	p-value					
	Prison vs. Com correction	1.0 (0.9 - 1.1)	0.9 (0.6 - 1.3)	1.0 (0.9 - 1.1)	1.0 (0.8 - 1.2)	0.9 (0.7 - 1.3)
Length of first sentence (REF: 0-0.5 years)	p-value	*			†	
	>2 years	1.1 (1.0 - 1.3)	1.4 (0.9 - 2.1)	1.0 (0.8 - 1.2)	1.6 † (1.2 - 2.0)	1.1 (0.8 - 1.6)
	1-5-2 years	1.2 * (1.0 - 1.4)	1.6 * (1.1 - 2.5)	1.1 (0.9 - 1.4)	1.7 ‡ (1.3 - 2.1)	1.3 (0.9 - 1.9)
	1-1-5 years	1.2 ^ (1.1 - 1.4)	1.3 (0.9 - 1.9)	1.1 (1.0 - 1.3)	1.5 ^ (1.2 - 1.8)	1.5 * (1.1 - 2.0)
	0-5-1 year	1.2 * (1.0 - 1.3)	1.1 (0.8 - 1.6)	1.1 (0.9 - 1.3)	1.4 † (1.2 - 1.8)	1.2 (0.9 - 1.6)
5-year h/o physical illness	p-value	‡	‡	‡	‡	†
	Yes vs. No	1.5 ‡ (1.4 - 1.6)	1.7 ‡ (1.3 - 2.2)	1.5 ‡ (1.4 - 1.7)	1.6 ‡ (1.4 - 1.8)	1.5 † (1.2 - 1.9)
5-year h/o attempted self-harm	p-value	‡		^	†	†
	Yes vs. No	1.7 ‡ (1.3 - 2.3)	1.3 (0.6 - 3.0)	1.6 ^ (1.2 - 2.2)	1.9 † (1.3 - 2.9)	2.8 † (1.7 - 4.6)

h/o: Pre-sentence history of; REF: Reference group; na: not applicable; \*: p<0.05; ^: p<0.01; †: p<0.001; ‡: p<0.0001

## Discussion

Most people do not contact MHSs in the five years after serving a sentence for a criminal conviction. Although pre-sentence MHS use was most strongly associated with doing so, still 58% of this group did not contact services; just 12% of those without previous service contact made any contact after sentence. Post-sentence use was predicted not only by prior health service contact for mental disorders but also for attempted self-harm and/or physical ill health. As far as we know, ours is the only study of this apart from one previous WA study that showed that pre-sentence service contact for mental disorders doubled the likelihood of such service use after incarceration (Hobbs et al., 2006).

Among those with a pre-sentence MHS contact, offenders with psychosis were more likely to access such services again than people with other diagnoses, similar to service use by diagnosis to the general Australian population (Burgess et al., 2009). Also, among those who had previously contacted about attempted self-harm, less than 30% of those who attempted harm after their sentence contacted MHSs prior to the self-harm episode. This finding raises questions about whether current throughcare and/or transitional care is adequate for linking people to appropriate community services after release (Borzycki and Baldry, 2003; Pratt et al., 2010). It would, after all, be expected that people with a history of self-harm could be susceptible to new stressors after sentence (Pratt et al., 2010; Jones and Maynard, 2013).

Although the overall rate of post-sentence MHS use was similar for prisoners (44%) and the community sentenced (48%), released prisoners with pre-sentence service contact were less likely to take up such services again. One explanation could be that community sentences allowed for better familiarity, access to and/or acceptance of MHSs. Another reason may be the range of personal, socio-economic and environmental challenges associated with returning to the community (Baldry and Maplestone, 2003; Borzycki, 2005; Binswanger et al., 2011; Barrenger and Draine, 2013), which possibly deters engagement with psychiatric services, which may be perceived as being not critical for survival (Wilson, 2013). Moreover, these services may be less available due to the disproportionate stigma associated with being a 'mentally ill criminal' (Coid, 1988; Burdekin, 1993; Lamb et al., 1999; Baillargeon et al., 2010). Over the last 15 years, various programmes have been introduced for WA prisoners for better post-release community integration (Outcare, 2010), but their availability is limited by scarce resources (Outcare, 2010).

Even in the general population, much mental illness, as well as sub-clinical disorder, is undetected (Nagle, 1999; Thornicroft, 2007). So, many first-time offenders without pre-sentence MHS contact may be expected to have previously undetected or sub-clinical mental illness. Nevertheless, their subsequent MHS use was very low (12%). In the light of previous reviews of prison healthcare (Burdekin, 1993; Human Rights Law Resource Centre, 2008) it is surprising that post prison service contacts were not higher, but we did not have the resource to examine reasons for this. A corrective services managed healthcare model operates in WA corrections (Office of the Inspector of Custodial Services, 2006). Treatment recommendations to courts are made for offenders 'suspected' of having a mental illness (Western Australia Prisons Department, 1985; Brett, 2003) with further screening for physical

and mental disorders carried out upon incarceration, but this structure does not, however, seem to be making a difference for this group.

Pre-sentence hospitalisation for physical illness, where there had been no MHS contact, was strongly associated with increased likelihood of post-sentence MHS use, possibly explained by the high prevalence of hospitalisations in those with a comorbid mental and physical illness (AIHW, 2011). Hospital admission for physical illness could, therefore, be viewed as a key event that may afford the opportunity to undertake a structured mental health assessment and identify any psychiatric comorbidity (Yoon and Bernell, 2012). Integrated psychiatric and physical healthcare services have an important role to play here (Hammett et al., 2001; Lawrence and Kisely, 2010; Yoon and Bernell, 2012), noting that physicians may not always be well-equipped to elicit co-existing psychiatric disorders, or may focus only on the presenting physical complaints (Goldberg and Gater, 1996).

Gender and cultural group differences in post-sentence MHS use were apparent regardless of pre-sentence use. Indigenous men and women were more likely to use services for any mental disorder and substance use disorders more specifically. Greater post-sentence MHS use for any mental disorder by Indigenous men is in agreement with previous findings in ex-prisoners (Hobbs et al., 2006; Alan et al., 2011) and the general community (AIHW and ABS, 2008). Nevertheless, after sentence completion, Indigenous men were less likely to use services for psychotic disorders compared with non-Indigenous men which was consistent with pre-sentence findings (Sodhi-Berry et al., 2014) and may reflect differences in cultural understanding of psychotic disorders (Parker and Milroy, 2003). Possible unmet need for services was raised by the fact that Indigenous women without a pre-sentence MHS contact were twice as likely to have attempted self-harm after sentence completion relative to other demographic groups. Although high prevalence of post-sentence self-harm has previously been reported among both Indigenous and non-Indigenous women prisoners (Hobbs et al., 2006), there may be a particular problem of service access for Indigenous women. Indigenous people are known to have a low health service engagement (Westerman, 2004) and yet be vulnerable to post sentence stressors or worsening of mental well-being from failures to identify or treat underlying disorders (Burdekin, 1993; Human Rights Law Resource Centre, 2008; Silburn et al., 2010).

After adjusting for other variables, significant associations between post-sentence MHS use and socio-economic disadvantage and residential accessibility were only observed in offenders without a pre-sentence MHS contact. This is consistent with a previous Australian finding (Parslow and Jorm, 2000). Nevertheless, given the low post-sentence service uptake for offenders without known pre-sentence MHS contact – and indeed for those who had - multi-sectoral area-level interventions would seem to be important (Morgan et al., 2008; Barrenger and Draine, 2013). During transitional and post-sentence periods, these would include housing, employment, security and health service provision; unmet needs in all these areas have been correlated with both crime and mental illness (Burdekin, 1993; Commonwealth of Australia, 2006; Barrenger and Draine, 2013).

Limitations of our study include lack of data on primary healthcare service provision. This is important because highly effective primary care could explain low use of secondary health services. Mentally ill people in the community do commonly make general practitioner contacts (Mai et al., 2010), but there is currently no published study on ex-offenders' engagement with general practitioners or its effect on post-sentence MHS contact. Another possibility is that people from our cohort used emergency department services (Frank et al., 2013) but we had no data on this either. As we were dependant on administrative pre-sentence and post-sentence records, we had little information for supporting other explanations. Data on service use during sentence and (ex)offender opinions would have been useful. Future qualitative research in this area might improve our understanding of consumer and institutional beliefs and attitudes which might improve psychiatric service uptake by those who need them most. Finally, jurisdictional variations in the provision of prison-based, transitional and community-based MHSs and/or throughcare services for offenders may impact on the generalizability of our results.

## **Conclusion**

Most first-time offenders (60%) with a pre-sentence MHS contact did not access MHSs after completing their sentence, with those imprisoned being less likely to do so than those on community sentences. This highlights possible gaps in the continuity of mental healthcare for offenders with a known psychiatric treatment history. The minority of offenders (12%) with no history of pre-sentence MHS use who subsequently did engage with such services were more likely to be Indigenous offenders, from the most disadvantaged areas and to have a

history of attempted self-harm and/or physical illness. Better healthcare management, including detection of mental disorders, whether in prison or in the community, seems indicated for improving throughcare or transitional arrangements.

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## **Disclaimer**

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