

Quantifying maternal incarceration: a whole-population linked data study of Western Australian children born 1985–2011

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Children of incarcerated parents are a uniquely vulnerable group. Exposed to a range of disadvantage within their family environment in such forms as domestic violence, parental mental health and substance use issues,^{1,2} they face additional difficulties through parental incarceration with disruption of care arrangements,^{3,4} financial impacts,⁵ stigmatisation,⁶ and psychological distress.^{7,8}

While debate exists over whether parental incarceration has any causal effect on child outcomes, over-and-above the effect of family environments,^{9,10} the literature has consistently found children of prisoners experience a range of problems. These issues include internalising and externalising behaviour problems,¹¹ poor developmental outcomes,¹² academic difficulties, lower rates of school completion,¹³ delinquency,^{14,15} and child mortality.¹⁶

Regardless of causality, children of prisoners are a vulnerable population with complex needs that warrant tailored attention. However, children of prisoners have received little attention from government. They are not the core business of any one department and instead intersect with numerous services including child protection, health, education and corrections. Currently services for Australian children of prisoners are provided on an ad hoc basis and vary considerably between States, Territories and prisons.¹⁷

This population is particularly invisible in their absence from any official statistical reporting.¹⁸ A small number of estimates of the proportion of prisoners who are parents exist from prisoner survey data,^{2,19} and few studies have estimated the extent of children

Abstract

Objective: To measure the prevalence of children affected by maternal incarceration in Western Australia (WA).

Methods: Using linked administrative data we identified all children born in WA between 1985 and 2011, whose biological mother was imprisoned during their childhood. Data was obtained through the WA Data Linkage Branch from the Department of Corrective Services, Midwives Notifications System and Birth Registrations data collections. Descriptive characteristics of the children (n=9,352) and their mothers (n=3,827) are reported. Prevalence was measured in two-ways, the proportion of children ever affected in childhood and affected annually.

Results: Childhood prevalence of maternal incarceration was 26-times higher (95%CI 23.9-28.2) for Indigenous children born 1992-1996 with 18.8% Indigenous children and 0.7% non-Indigenous children affected while aged 0-17 years. On average 1,544 children were affected each year across 2003-2011, at rates of 2,929 per 100,000 Indigenous children and 108 per 100,000 non-Indigenous children.

Conclusions: The findings present the first census of children affected by maternal incarceration within an Australian State and identify a large disparity between Indigenous and non-Indigenous populations.

Implications for public health: This study highlights the importance of formal consideration of children of women prisoners in the development of criminal justice policies and practices.

Key words: children, maternal incarceration, prison, prevalence, linked data

affected from prisoner surveys based on a range of assumptions.^{18,20}

Without a clear picture of the number of children experiencing parental incarceration and a description of their basic characteristics, it is impossible to deliver appropriate services or to consider their needs in the development of criminal justice policies.

Children of incarcerated mothers face a unique set of circumstances in addition to those relating to paternal incarceration. Incarcerated mothers are more likely to have been the primary or sole child-caregiver prior to imprisonment.²¹ For young children this may contribute to disruption of secure

attachment if mother-baby facilities are not available in correctional facilities.¹² Although the absolute numbers of women prisoners are low compared to men, the female prison population is growing at a faster rate.²²

Indigenous women are the fastest growing prison population within Australia.²³ Many Indigenous Australians experience worse health and social outcomes than non-Indigenous Australians, resulting from a long-history of systemic discrimination including land dispossession and the forced separation of Indigenous children from their families.²⁴ The imprisonment of Indigenous mothers is a particularly important issue given the

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propensity for this to continue disruption of Aboriginal families and culture for future generations.

In this context, the objective of the current study was to describe the size and extent of the Western Australian (WA) population affected by the incarceration of their mother during childhood, with a particular focus on differences between Indigenous and non-Indigenous populations.

Methods

Cohort selection

The cohort included all children born in WA between 1 January 1985 and 31 December 2011 whose biological mother had at least one custodial record in a WA prison during their childhood (0-17 years inclusive) to 31 December 2014. This included mothers who were unsentenced remandees or juveniles held in custody.

A custodial record was defined by any entry in the WA Total Offender Management Solution (TOMS) system. The TOMS system is maintained by the WA Department of Corrective Services (DCS) and includes all custodial records within WA. It excludes unsentenced individuals detained in holding cells within police stations and courts, immigration detention centres, and mental health facilities. Mothers with community corrections orders but no custodial record were excluded from the study population.

Data linkage and extraction

The identification of the study population and extraction of links for project data were performed by the WA Data Linkage Branch. The Data Linkage Branch maintains the Western Australian Data Linkage System (WADLS). The WADLS uses computerised probabilistic matching with clerical review to establish a master linkage key between WA administrative data collections.²⁵ The linkage

process is highly accurate, with 99.89% of links estimated as valid.²⁵ Linkage between DCS and other WADLS data collections has previously been performed for offender health research.²⁶⁻²⁸ Indigenous status for mothers and children was provided through the WADLS using best-practice algorithms,²⁹ which derive Indigenous status across multiple data collections to reduce missing data and improve consistency.

Children's records were extracted from the Birth Registrations and Midwives Notification System data collections. Data were available from both sources for the period of January 1985 to December 2011. Data on mothers were extracted from the DCS data collection and restricted to prison records on or before 31 December 2014. Erroneous records in which the prison reception and discharge date-time were identical (n=67) were excluded. For prison records not discharged by the date of data extraction (28 August 2015, n=68), a censoring date of 28 August 2015 was assigned for the calculation of child age and length of imprisonment.

Study subgroup observations within the total cohort

As the cohort was born between 1985-2011, data were available for various lengths of time for individual cohort members. Accordingly analyses drew on different subgroups of data, as outlined in Table 1.

Analyses

Cohort description

Descriptive statistics for children were calculated, including Indigenous status, sex, age and socioeconomic status. Birth-date and sex were derived from Birth Registration data, or Midwives Notifications System data if birth data were unavailable.

Descriptive information on mothers were derived from the data, including Indigenous status, age at imprisonment, number of

cohort children, number and length of imprisonment terms, whether they were sentenced or unsentenced, and offence type.

Annual prevalence

Annual age-standardised rates of Indigenous and non-Indigenous WA children who experienced maternal incarceration while aged 0-17 years in 2003-2011, 0-9 years in 1995-2011 and 0-4 years in 1990-2011 (see Table 1), were calculated using population denominators derived from the Australian Bureau of Statistics (ABS).^{30,31} The rate of children aged 0-15 years affected by maternal incarceration in 2001 was calculated separately for comparison with existing New South Wales (NSW) estimates.²⁰

Childhood prevalence

Prevalence of children who experienced maternal incarceration during childhood from birth to age 17 years, nine years and four years was calculated by birth years from 1985 to 1996, 2004 and 2009 respectively (see Table 1). Population denominators comprised the total number of live births in WA per year.³² This analysis was stratified by Indigenous status for children born from 1992 onwards as WA Indigenous birth registration data are only available from 1992.²⁹

Average annual percentage change in the rate of children affected across each time period was calculated using the following equation:

$$\frac{\left(\sum_{i=2}^n \frac{Rate_{Year\ i}}{Rate_{Year\ i-1}} - 1\right) \times 100}{n - 1}$$

Where n is the total number of years, Year 1 is the first year and Year n is the last year.³³

Proportion of WA female prisoners who are mothers

The proportion of women prisoners who are mothers (of children aged 0-17 years) at the time of their incarceration was calculated from the total number of female prisoners in WA identified in the ABS Prisoner Census for years 2003-2011.²² The Prisoner Census is taken on 30 June each year, it includes all women remanded or sentenced to adult custodial corrective services in WA on that day. The number of mothers in prison on 30 June each year was calculated using mother's reception and discharge dates in the DCS data. Mothers in juvenile custodial facilities were excluded as they are not included in the Prisoner Census.²²

Table 1: Study subgroup observations within the total cohort.

Analysis	Child birth years	Data observation period	Child age at time of maternal incarceration
Cohort description (total cohort)	1985-2011	1985-2014	0-17 years
Childhood prevalence ^a	1985-1996	1985-2014	0-17 years
	1985-2004	1985-2014	0-9 years
	1985-2009	1985-2014	0-4 years
Annual prevalence	1985-2011	2003-2011	0-17 years
	1985-2011	1995-2011	0-9 years
	1985-2011	1990-2011	0-4 years
Proportion of mother prisoners ^b	1985-2011	2003-2011	0-17 years

a: Indigenous status for WA population birth data only available from 1992

b: Point in time estimate on 30 June annually.

Socioeconomic status classification

The Socioeconomic Indexes for Areas (SEIFA) Index of Relative Socioeconomic Disadvantage (IRSD)³⁴ was used to assign area-based socioeconomic status of children's place of residence at time of birth. The IRSD score is a continuum where lower scores equate to relatively more measures of economic and social disadvantage within an area.

The smallest area of SEIFA reporting is Collectors District (CD) level, which is about 250 households or less in rural areas.³⁴ CD level scores were missing for 9.3% of the cohort. CD level is not available for certain areas, for example where low census response rates would jeopardise the representativeness of respondents.³⁵ Other examples for exclusion include very low levels of employment or where income could not be calculated in 70% or more households.³⁵ Missingness is therefore likely to be associated with disadvantage. For this reason, missing CD scores were first replaced with mean CD-score by postcode (7.9%) before using broader area scores of SEIFA available for Statistical Local Area or Local Government Area (1.1%).

Offence type classification

TOMS data provided the major offence type for prisoners using the Australian Standard Offence Classification (ASOC).³⁶ The ASOC classifies offences within 16 Divisions using criteria based on the use of violence, aim, victim, seriousness and intent.³⁶

Statistical analyses

Statistical analyses were undertaken in Stata version 14.0. Difference between Indigenous and non-Indigenous children and mothers' demographic characteristics were assessed using the Mann-Whitney test for continuous variables and a Pearson's chi-square for categorical variables.

Assumptions for the Mann-Whitney test were met as the dependent variables were ordinal or continuous, the independent variable consists of two independent groups, observations were independent, and all variables were not normally distributed as established from skewness and kurtosis tests for normality.³⁷

Continuous variables were divided into categories to better describe the spread of the data. Pearson's chi-square test was used to assess differences between Indigenous and non-Indigenous groups for categorical

variables. All assumptions for Pearson's chi-square test were met as observations were independent from each other and all cells had expected counts above five.³⁸

Ethics approvals

Ethics approvals were obtained from the Department of Health Human Research Ethics Committee, the Western Australian Aboriginal Health Ethics Committee, and the University of South Australia Human Research Ethics Committee.

Results

Table 2 summarises the characteristics of the cohort children. In total 9,352 children who were born in WA between 1985 and 2011 had their biological mother incarcerated at least once by December 2014. Approximately two-thirds of the cohort were Indigenous. Indigenous children (Mdn age = 4.2 years) were younger than non-Indigenous children (Mdn age = 5.1 years) at first exposure to their mother's imprisonment, $U = 7.11, p < 0.0001$. Half of all cohort children were first exposed by the age of four. Over half of the children were living in the 20% most disadvantaged areas. More Indigenous children were in the most disadvantaged areas, $\chi^2 (4, N = 9326) = 692.38, p < 0.0001$.

Point prevalence of maternal incarceration for mothers of children aged 0-17 years on 30 June 2003 was 60.9% Indigenous and 45.0% non-Indigenous women prisoners, $p = 0.0214$, prevalence ratio (PR) 1.35, 95%CI 1.05 to 1.74. On 30 June 2011 67.5% Indigenous and 50.0% non-Indigenous women prisoners were mothers, $p = 0.0009$, PR 1.31, 95%CI 1.13 to 1.61. As shown in Table 2, there were 3,827 mothers in total. Indigenous mothers (Mdn = 2) had higher numbers of children within the cohort than non-Indigenous mothers (Mdn = 2), $U = -12.69, p < 0.0001$. Around three-quarters (72%) of non-Indigenous mothers had 1-2 children compared to half (53%) of Indigenous mothers, whereas, half (47%) of Indigenous mothers had 3-12 children compared with one-quarter (28%) of non-Indigenous mothers, $\chi^2 (4, N = 3827) = 213.90, p < 0.0001$. Data do not represent total family size as only children who met the study criteria are included.

Indigenous mothers (Mdn age = 25.4 years) were younger than non-Indigenous mothers (Mdn age = 28.9 years) at the time of their first imprisonment when their child entered the cohort, $U = 14.007, p < 0.0001$. Indigenous mothers were three-times more likely to be

aged less than 20 years, and four-times more likely to be under 18 years of age. Age profile of Indigenous and non-Indigenous mothers differed across age groups in Table 2, $\chi^2 (6, N = 3,827) = 200.27, p < 0.0001$.

The number of imprisonments per mother was lower for non-Indigenous mothers (Mdn = 1) than Indigenous mothers (Mdn = 2), $U = -11.54, p < 0.0001$. Around half (54%) Indigenous mothers had 1-2 imprisonments compared to 70% of non-Indigenous mothers. While one-quarter (26%) of Indigenous mothers were imprisoned 5-42 times, compared to 12% of non-Indigenous mothers who were imprisoned 5-24 times, $\chi^2 (4, N = 3827) = 145.69, p < 0.001$.

In total, cohort mothers had 12,370 records of imprisonment while at least one of their children was aged 0-17 years. Indigenous mothers had shorter prison stays (Mdn = 15.8 days) than non-Indigenous mothers (Mdn = 20.8 days), $U = 4.28, p < 0.0001$. Patterns of length of imprisonments in Table 2 were similar for Indigenous and non-Indigenous mothers, but differed across all categories, $\chi^2 (7, N = 12370) = 100.73, p = 0.0001$. Three-quarters ($n = 9,219$) of all mothers' imprisonment records were for three-months or less.

Length of imprisonment may be influenced by offence type which differed between Indigenous and non-Indigenous mothers (Table 2), $\chi^2 (15, N = 11,782) = 1.5e+3, p = 0.0001$. Indigenous mothers were twice as likely to be detained for acts intended to cause injury or endangerment offences than non-Indigenous mothers. Similar proportions of Indigenous and non-Indigenous mothers' records were for breach of justice procedures. Fraud offences were more common amongst non-Indigenous mothers, as were illicit-drug offences. Similar proportions of mothers were detained for unlawful entry with intent, theft and traffic offences. Homicide, sexual assault, abduction and weapons offences contributed to a small proportion of mothers' records. Sentence type differed between Indigenous and non-Indigenous mothers, $\chi^2 (1, N = 12370) = 48.03, p < 0.0001$.

Annual prevalence of children experiencing maternal incarceration in WA

Figure 1 displays the annual age-standardised rates of WA children experiencing maternal incarceration in WA across the study period. The number of children affected each year,

prevalence figures and prevalence ratios with 95% CIs are detailed in Supplementary Table 1. Across 2003–2011 on average 1,544 WA children were affected by maternal incarceration each year, at a rate of 303 children per 100,000 population aged 0–17 years. As can be seen from the marked difference in scale between the two graphs in Figure 1, Indigenous children aged 0–17 years were 27 times (95% CI 24.5–30.3) more likely to experience maternal incarceration across 2003–2011 with an average rate of 2,929 per 100,000 Indigenous children (n=1,034) affected each year, compared to 108 per 100,000 non-Indigenous children (n=510). Between 2003–2011 the average annual

percent change was -0.9% for Indigenous children, 1.8% for non-Indigenous children, and -0.3% overall for all children aged 0–17 years.

Childhood prevalence of maternal incarceration for children born in WA

Supplementary Table 2 outlines the age-specific childhood prevalence figures for WA children by year of birth. Nearly one-fifth (18.8%, n=1,368) of Indigenous children born in WA between 1992–1996 experienced maternal incarceration during childhood to age 17 years. In comparison, 0.7% (n=843) of non-Indigenous children born during the same period were affected. Accordingly,

Indigenous children were 26 times (95% CI 23.9 to 28.2) more likely to be affected than their non-Indigenous counterparts. The average annual percent change for children born between 1992–1996 was -7.3% for Indigenous children, 1.1% for non-Indigenous children, with an overall increase of 2.2%.

Comparison between WA and NSW estimates for children aged 0–15 years in 2001

Analysis of data of children aged 0–15 years affected by maternal incarceration in WA in 2001 was undertaken for comparison with published estimates of children affected in NSW.²⁰ Similar rates of non-Indigenous

Table 2: Characteristics of children born in Western Australia (1985–2011) affected by maternal incarceration during childhood (0–17 years) and their mothers.

Characteristics	Indigenous n (%)	Non-Indigenous n (%)	Total n (%)	Characteristics	Indigenous n (%)	Non-Indigenous n (%)	Total n (%)
Children				Mothers			
Number	5,943 (64)	3,409 (36)	9,352 (100)	Number	2,075 (54)	1,752 (46)	3,827 (100)
Sex				Number of children	5,785 (62)	3,567 (38)	9,352 (100)
Male	3,021 (51)	1,772 (52)	4,793 (52)	Children per mother ^{***}			
Female	2,922 (49)	1,637 (48)	4,559 (48)	1	655 (32)	759 (43)	1,414 (37)
Age at first exposure ^{***}				2	438 (21)	501 (29)	939 (25)
Birth	109 (2)	83 (2)	192 (2)	3	375 (18)	293 (17)	668 (17)
0–4 years	3,235 (54)	1,606 (47)	4,841 (52)	4	261 (13)	117 (7)	378 (10)
5–9 years	1,530 (26)	979 (29)	2,509 (27)	5+	346 (17)	82 (5)	428 (11)
10–14 years	809 (14)	560 (16)	1,369 (15)	Age at imprisonment ^{b***}			
15–17 years	260 (4)	181 (5)	441 (5)	13–17 years	107 (5)	25 (1)	132 (3)
Socioeconomic level ^{a***}				18–19 years	233 (11)	76 (4)	309 (8)
1 (least disadvantaged)	70 (1)	191 (6)	261 (2)	20–24 years	669 (32)	430 (24)	1,099 (28)
2	215 (4)	368 (11)	583 (6)	25–29 years	489 (23)	448 (25)	937 (24)
3	566 (10)	572 (17)	1,138 (12)	30–34 years	328 (16)	375 (21)	703 (18)
4	1,196 (20)	880 (26)	2,076 (22)	35–39 years	172 (8)	228 (13)	400 (10)
5 (most disadvantaged)	3,884 (65)	1,384 (41)	5,268 (56)	40+ years	69(3)	117 (7)	186 (5)
Imprisonments				Imprisonments			
Number prison records	8,130 (66)	4,240 (34)	12,370 (100)	Offence type ^{d***}			
Records per mother ^{***}				Homicide	68 (1)	31 (1)	99 (1)
1	755 (36)	877 (50)	1,632 (43)	Injury	1,830 (24)	419 (10)	2,249 (20)
2	374 (18)	359 (20)	733 (19)	Sexual assault	12 (<1)	21 (<1)	33 (<1)
3	249 (12)	191 (11)	440 (12)	Endangerment	423 (5)	76 (2)	499 (4)
4	155 (7)	118 (7)	273 (7)	Abduction	91 (1)	42 (1)	133 (1)
5+	542 (26)	207 (12)	749 (20)	Robbery/extortion	305 (4)	212 (5)	517 (4)
Duration ^{***}				Unlawful entry	921 (12)	512 (13)	1,433 (12)
< 24 hours	716 (9)	454 (11)	1,170 (9)	Theft	867 (11)	524 (13)	1,391 (12)
1–7 days	2,305 (28)	1,085 (26)	3,390 (27)	Fraud	182 (2)	518 (13)	700 (6)
1–4 weeks	1,838 (23)	803 (19)	2,641 (21)	Illicit drug	87 (1)	452 (11)	539 (5)
1–3 months	1,373 (17)	645 (15)	2,018 (16)	Weapons	20 (<1)	11 (<1)	31 (<1)
3–6 months	838 (10)	510 (12)	1,348 (11)	Property damage	196 (3)	57 (1)	253 (2)
6–12 months	657 (8)	402 (9)	1,059 (9)	Public order	312 (4)	55 (1)	367 (3)
1–2 years	320 (4)	257 (6)	577 (5)	Traffic regulatory	852 (11)	461 (11)	1,313 (11)
2+ years	83 (1)	84 (2)	167 (1)	Justice procedures	1,476 (19)	656 (16)	2,132 (18)
Sentence type ^{c***}				Miscellaneous	57 (1)	36 (1)	93 (1)
Unsentenced	3,254 (40)	1,972 (47)	5,226 (42)				
Sentenced	4876 (60)	2,268 (53)	7,144 (58)				

a: Missing socioeconomic data for 12 Indigenous and 14 non-Indigenous children.

b: Age of mother determined at imprisonment when first child entered the cohort during the study period.

c: 'Sentenced' imprisonments can include a period where the prisoner is held on remand (unsentenced) before they were sentenced.

d: Offence data missing for 431 Indigenous and 157 non-Indigenous records of imprisonment.

*** p<0.0001

children were affected in WA (108 per 100,000) and NSW (112 per 100,000) during 2001.²⁰ Twice the proportion of Indigenous children were affected in WA (2,738 per 100,000) than NSW (1,449 per 100,000).²⁰ Comparison of data for children aged 0-15 years in 2001 who had ever experienced the incarceration of their mother throughout childhood, found a 2.4-fold greater rate of Indigenous WA children affected (8,838 per 100,000) compared to NSW estimates (3,689 per 100,000).²⁰ However, the difference in rates was 1.8-fold higher for non-Indigenous children in NSW (599 per 100,000) than in WA (328 per 100,000).²⁰

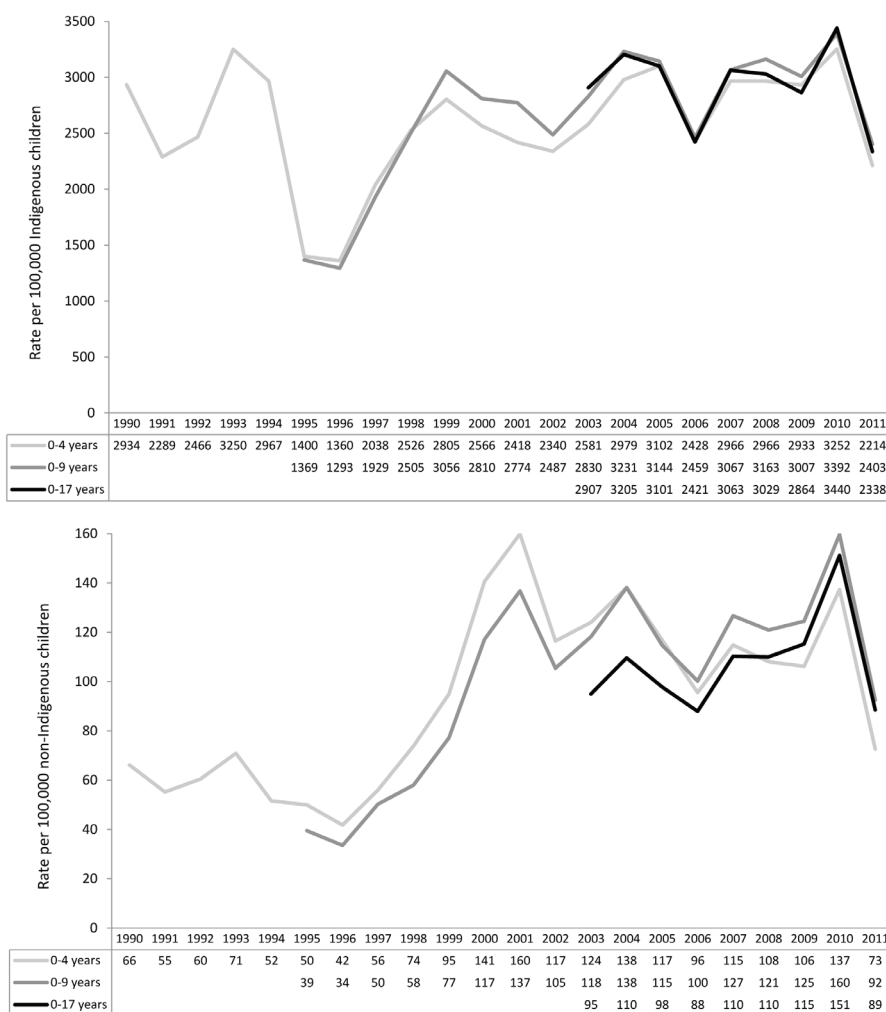
Discussion

Using whole-population linked data this article provides the first census of children affected by maternal incarceration in an Australian State. It demonstrates that Indigenous children and mothers are disproportionately affected. Across 2003-2011, WA Indigenous children aged 0-17 years were 27 times (95%CI 24.5 to 30.3) more likely to be affected than non-Indigenous children. This disparity reflects higher rates of imprisonment of Indigenous women²² and their greater likelihood of being mothers at younger ages and with higher fertility rates.

Figure 1 illustrates annual prevalence across the study period. The drop in rate of Indigenous children affected between 1994 and 1996, seen to a lesser extent for non-Indigenous children, coincides with the enactment of the *Fines, Penalties and Infringement Notices Enforcement Act 1994* (WA).³⁹ The purpose of the Act was to reduce the use of imprisonment for non-payment of fines by providing alternative sentencing options such as licence suspension and property forfeiture.⁴⁰ Regarding the subsequent rise in rates seen from 1997, it has been postulated that the policy was not as effective at reducing imprisonment for low socioeconomic status women.^{41,42}

For children born between 1992 and 1996 there was a -7.3% decline in prevalence of Indigenous children who experienced maternal incarceration by age 17-years, compared to a 1.1% increase for non-Indigenous children. The denominator (number of WA births) is likely responsible for this apparent trend. Supplementary Table 2 reports the number of children born each year who were affected by maternal incarceration throughout childhood. The number of children affected between birth

Figure 1: Age-standardised rates of Indigenous and non-Indigenous children affected by maternal incarceration each year, 1990-2011.



years fluctuates within a relatively small range for both Indigenous and non-Indigenous children. However, from 1992 to 1996 the total number of Indigenous births increased (n=1,215 to n=1,538), while non-Indigenous births decreased (n=23,858 to n=23,255).³²

The higher rates of Indigenous children affected in WA annually and throughout childhood compared to NSW²⁰ is likely largely explained by higher rates of Indigenous female imprisonment in WA (560 per 100,000 women) than NSW (391 per 100,000 women) in 2001.²² This may in part reflect differences in offences, penalties and sentences imposed between the States. For example, a fine is the most common penalty for traffic related offences in WA (for which non-payment may result in imprisonment) whereas in addition to fines NSW imposes alternative penalties including 'intensive supervision' and 'no conviction recorded'.⁴³

Since our final study estimates in 2011 the rate of female imprisonment in WA has increased by 18%, with the number

of Indigenous women prisoners rising by 37% compared to 10% for non-Indigenous women prisoners.²² Accordingly, the disparity reported here between Indigenous and non-Indigenous children and mothers has likely only been exacerbated.

Note that the increasing rate of Indigenous female imprisonment is not necessarily associated with an equal increase in offending behaviours or criminality within the community. Analysis has found the predominant cause of increasing Indigenous imprisonment within NSW is a more rigid response to Indigenous offenders throughout the criminal justice system, such as in remand and sentencing practices.⁴⁴ This can be driven by socioeconomic factors such as homelessness, for example bail is often contingent on having stable accommodation which can result in offenders being detained on remand in instances where they would otherwise be released before trial.⁴⁵ As shown in this study, Indigenous children were most likely to reside in the lowest 20%

of socioeconomic areas, indicating the high level of disadvantage also experienced by their mothers.

The cohort generally experienced higher levels of socioeconomic disadvantage than the wider WA population. For Indigenous cohort children, 65% resided in the lowest socioeconomic quintile compared to 46% of the WA Indigenous population and 1% in the highest quintile compared to 6% of the WA Indigenous population.⁴⁶ The difference was more pronounced for non-Indigenous cohort children, with 41% in the lowest quintile compared to 11% of the WA non-Indigenous population and 6% in the highest quintile compared to 28% of the WA non-Indigenous population.⁴⁶

Children are most likely to first experience maternal incarceration when aged less than five-years. This is a key time in child development. The attachment literature illustrates how maternal separation during this time can result in lasting impacts on children.⁴⁷ Specialised mother-baby programs facilitated within prisons have improved attachment outcomes for infants at-risk of disorganised attachment relationships.¹² The majority of WA women prisoners report that their children are cared for by family members while they are incarcerated.² Qualitative research has found children still experience significant disruption to their living and care arrangements during this time.^{3,48} Further research is required to understand children's outcomes and their relationship to the experience of maternal incarceration.

Internationally, cumulative risk of maternal imprisonment in childhood up to 14 years of age has been estimated in Denmark and the United States (US) using a single-year birth cohort of all children born in 1990 using administrative registry data in Denmark and a number of sources of prisoner data in the US. Denmark estimates included prison stays less than 24 hours, as was our approach.⁴⁹ In Denmark, 2.2% of children born in 1990 experienced maternal incarceration by age 14-years.⁴⁹ In comparison, 1.6% of WA children born in 1990 experienced maternal incarceration by age 17 years. However, significant increases in the WA female prison population occurred throughout the mid-1990s²² with a corresponding increase in the number of children affected as demonstrated in this article.

The US data was restricted to prison stays of over one year,⁴⁹ making comparisons with the current study difficult. One comparison that can be made is the level of racial disparity

observed. In the US 0.6% of White and 3.3% of Black children born in 1990 were affected by maternal incarceration (of one-year or longer) by 14 years of age, a 5.5-fold difference.⁴⁹ For WA children born in 1992, 0.7% of non-Indigenous and 23.7% of Indigenous children were affected by any maternal incarceration by age 18 years of age, representing a 35-fold difference. This reinforces the magnitude of the disparity in Australia.

Limitations

Estimates of Indigenous populations based on Australian census data and administrative data are affected by a number of factors.²⁹ Willingness to self-identify as Indigenous is often dependent on the context of the service contact.²⁹ This affects the accuracy of Indigenous population estimates and is more relevant for earlier study years. Best available data has been used in the identification of Indigenous status for study participants through the WADLS best-practice algorithm²⁹ and in using the most recently available data for population denominators.

Motherhood was defined according to formal Birth Registration data, therefore any non-biological mothers were excluded. Similarly excluded were children who migrated to WA after birth, or children born in WA whose mothers were imprisoned outside WA. Likewise biological mothers were assumed to have a continuing relationship with their children from birth. The WA DCS conducted interviews with 64 female prisoners in 2008, including questions on motherhood.² They found 61% of respondents had children under 18 years of age,² which was the figure we derived for 30 June 2008, thereby providing some support for the study estimates.

The quality of linked administrative data can be affected by factors such as incorrect or missing links and completeness.⁵⁰ The WA Data Linkage Branch implements a number of processes to enhance data validity.⁵⁰

SEIFA IRSD data was only available for the 1996, 2001 and 2006 censuses.³⁴ The CD level score for the census closest to an individual's record was used. Economic and social characteristics of an area can change over time, which may affect SEIFA accuracy for the eldest cohort members born from 1985.

Conclusion

Using population-wide linked administrative datasets, this article provides accurate, high

quality data on the size of the population of children and mothers affected by maternal incarceration in WA over two decades. It highlights the overrepresentation of Indigenous mothers and children within this population. Indigenous children experience maternal incarceration at higher rates, at younger ages and more frequently throughout childhood.

This study is timely in extending knowledge of the children affected by maternal incarceration as the WA DCS has recently formed the Women's Estate Reference Committee to advise on policy to address the needs of the State's increasing women's prison population.⁵¹ This presents an opportunity to develop criminal justice policies that help to prevent further entrenchment of disadvantage for vulnerable families.

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Supporting Information

Additional supporting information may be found in the online version of this article:

Supplementary Table 1: Annual prevalence of maternal incarceration in Western Australia.

Supplementary Table 2: Childhood prevalence of maternal incarceration in Western Australia.