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## Shedding light on the social and health realities of care-experienced young people in Western Australia: A population-level study

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### ABSTRACT

**Background:** Young people who were in out-of-home care (OHC) face an accelerated transition to independent adulthood. Current evidence on outcomes for Australian care-leavers is scant.

**Objective:** This study aims to develop a better understanding of the outcomes for young people leaving care.

**Participants and setting:** A birth cohort of children and young people born in Western Australia (WA) from 1993 to 2008. Three groups were identified and compared: young people with care-experience (OHC Cohort), those with child protection involvement but not care experience (CP Contact Cohort), and peers in the general population (No Contact Cohort).

**Methods:** This is a retrospective, population-based study utilising de-identified, linked administrative records provided by the WA state government agencies. Data from the three cohorts were compared through descriptive statistics, independent samples *t*-tests, and logistic regression modelling.

**Results:** The birth cohort contained records for 414,266 individuals. The smallest comparison group in this study was the OHC Cohort ( $n = 6526$ ), followed by the CP Contact Cohort ( $n = 78,095$ ), and the No Contact Cohort ( $n = 329,645$ ). Care-experienced young people in WA fared significantly worse than their peers across the domains of health (physical and mental), disability, education, social housing and criminal justice involvement.

**Conclusions:** Those who have had child protection involvement, but have not been placed in care, had better outcomes than those who had been in care. However, their outcomes were still poorer than the population cohort with no child protection contact.

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## 1. Introduction

Out-of-home care (OHC) refers to a form of care for children and young people who are unable to live with their primary carers, often due to neglect, abuse, risk of harm, or in situations where parents cannot provide adequate care or require respite (Australian Institute for Health and Welfare [AIHW], 2022a). Within Australia, OHC is one intervention forming part of a more extensive child protection system comprising a range of intensive family support services. Australia has had a steady increase in the number of children and young people encountering child protection services, including OHC, and an overrepresentation of Aboriginal and Torres Strait Islander children and young people in the Australian child protection system is widely recognised (AIHW, 2017, 2022a). Nationally, there are approximately 7632 young people in care aged 15–17, and until recently announced reforms around options for continued support past the age of 18 years, statutory responsibility for the care of children and young people in OHC ended when a young person turned 18, meaning these young people would age out of the child protection system on their 18th birthday (AIHW, 2022a).

Young people who age out of the child protection system face an accelerated transition to independent adulthood compared to their peers with no care experience. Recent data reveals that at age 19, over 70 % of Australian young people in the general population live at home and/or receive family financial support; a living arrangement that persists for 27 % of 25-year-olds (Ribar & Wong, 2022). This increasing length of time where young adults remain dependent on family for housing and financial support is referred to as emerging adulthood; however, in general, such options may not have been available to Australian young people in OHC after 18 years. Even though the option for young people to access services and resources beyond the age of 18 has been available, this has generally relied on young people knowing about the supports available and initiating contact.

At the same time, care-experienced young people are also shown to have poorer outcomes in adulthood compared to peers with no child protection involvement. International evidence consistently shows young people who transition from care to independence (commonly referred to as ‘care leavers’) experience poorer outcomes, such as higher unemployment rates, homelessness, justice system involvement, mental health problems, and early parenthood (Organisation for Economic Co-operation and Development, 2022). International and national research points to several reasons for these poorer outcomes, which include: the impact of trauma from child abuse and neglect; placement instability; lack of belonging, community connections and support; poorer school achievement due to the interplay of these factors, which then impacts on pathways to further education and employment; the sudden transition from childhood to independence at 18, all of which contribute to homelessness and poverty (Mendes, 2022).

Current evidence on outcomes for Australian care-leavers is scant, but a small number of studies indicate that outcomes within Australia mirror international findings. Beyond 18, a longitudinal study of a sample of care leavers in the state of Victoria, found low rates of high school completion and employment combined with high levels of financial and emotional distress among participants once they had left care (Muir et al., 2019). Population-level studies have found that compared to their peers without care experience, Australian care leavers were more likely to access homelessness services as an adult, had higher rates of hospital admissions and mental health problems, lower levels of high school achievement, and were more likely to be involved in the justice system (Lima et al., 2018; Martin et al., 2021). While this evidence suggests that outcomes for those with care experience are often poor, little is known about whether and how these outcomes differ from those of young people who may have come to the attention of the child protection system but were not removed from family and were diverted to other interventions to reduce risk of harm or were not deemed at risk. A report commissioned by the Department of Communities in Western Australia (the government agency responsible for child protection) identified that individuals with OHC experience had poorer outcomes on most indicators of health, education, and justice system involvement than their peers who were the subject of child maltreatment allegations but were not placed in care (Lima et al., 2018). While the report noted statistically significant differences between these two groups on several indicators, it did not explore the practical significance of those differences (e.g., effect sizes), and it did not explore indicators in other known areas of inequity for young people with care experience, such as disability, offending and interactions with police, homelessness, utilisation of public housing, engagement in education or training post-school, or employment.

Understanding the outcomes for this group of young people is particularly important to inform future responses. As the number of young people in care is increasing annually, the inequity in outcomes is likely to continue and impact a larger number of young people in the future. Addressing this social policy problem by reducing the number of children who enter out-of-home care and improving practices to reduce the inequity is of utmost importance for those in care. Governments worldwide have recognised a need to support care leavers beyond 18 years of age to minimise these discrepancies in outcomes (Organisation for Economic Co-operation and Development, 2022). Recently, all Australian states and territories have either committed to or have begun offering extended care options for care leavers until the age of 21 years (Mendes, 2022). Given the movement towards extended support for care leavers, assessing the types of supports required by, available to, and accessed by young people is essential, as well as monitoring outcomes across a range of indicators to ensure that the implementation of support optimises young people’s outcomes after transitioning from care.

This study is intended to contribute to a better understanding of the population-level outcomes for care-experienced young people compared with two other population-based groups with varied levels of child protection involvement: 1) young people whose families had child protection involvement, but were not placed in OHC, and 2) and peers in the general population. Including the child protection cohort that did not enter OHC is an important addition to current research as this would also likely be a marginalised group of young people and could contribute to a greater understanding of outcomes for the care-experienced population. Being a federated nation, statutory responsibility for child protection lies with Australian states, so legislation and policy guiding the implementation of child protection services can differ between jurisdictions. As such, this study focuses on exploring outcomes for young people in one Australian jurisdiction, Western Australia (WA). The objectives of this study were threefold:

1. To describe key indicators of health, education, housing, police, justice and disability among three WA population-based cohorts: young people with OHC experience, young people who have had interactions with child protection services but not placed in OHC, and young people who have never had contact with the child protection system.
2. To explore differences in the key indicators above for young people with OHC experience in WA and those who have had child protection notifications but were not placed in OHC.
3. To explore differences in the key indicators above for young people with OHC experience in WA and those who have never had contact with the child protection system.

## 2. Methods

To address the aims, we conducted a retrospective, population-based study utilising de-identified, linked administrative records for a birth cohort of children and young people born in WA from 1993 to 2008.

### 2.1. Datasets

The data for this study were accessed via WA's Social Investment Data Resource (SIDR; Ferrante et al., 2020). The SIDR is a population-level database of linked administrative records provided by the WA Departments of Health, Communities, Education and Justice, the Registrar of Births, Deaths and Marriages, and WA Police Force. A description of the SIDR linked datasets utilised for this study and dates of availability are provided in Table 1.

The data were linked by data linkage experts at using the LinXmart record linkage software (Version 1.8.3; Boyd et al., 2019; Ferrante et al., 2022). LinXmart performs linkage across event-level datasets based on user-defined matching of demographic information using both deterministic and probabilistic methods. We accessed the de-identified linked data within the SIDR using the Secure e-Research Platform infrastructure where the data is hosted. Before accessing the data, approval was obtained from all relevant data custodians, the university human research ethics committee (HREC), Department of Health HREC, and Western Australian Aboriginal Health Ethics Committee.

### 2.2. Study population

Data from a birth cohort of individuals born in WA from 1993 to 2008 were available to the study. Three groups were identified within the birth cohort for the purpose of this study: 1) those with a history of at least six months in OHC (OHC Cohort); 2) those who have had child protection notifications for child maltreatment but without a history of out-of-home care (CP Contact Cohort); and 3) those with no record of child protection contact (No Contact Cohort).

Dates of birth within birth registration records were used to identify the birth cohort. Next, those who have had contact with child protection services were identified using the child protection client dataset. Anyone in the birth cohort not found in this dataset

**Table 1**  
Datasets within the SIDR accessed for this study.

Data custodian	Dataset	Dates	Data description
Registrar of Births, Deaths, and Marriages	Birth Registrations	1990–2019	All registered births in WA.
Department of Communities	Child Protection and Family Support	1990–2019	Notifications of child maltreatment, investigations, substantiations, and periods of out-of-home care.
	Disability services clients	2002–2018 <sup>a</sup>	The WA Department of Communities provided this dataset and includes the primary disability of those who accessed disability services provided by the WA government.
Department of Health	Housing customers, applications, households, tenancies	1990–2019	Applications for public housing made in WA and tenancies in public housing properties.
	Hospital Morbidity Data Collection	1990–2019	Patients admitted to public and private hospitals, including dates of admission and separation (mm/yyyy), principal diagnosis (ICD-10).
	Emergency Department Data Collection	2002–2019	Patients presenting at hospital emergency departments, including date of presentation (mm/yyyy), principal diagnosis (ICD-10).
Department of Education	Midwives Notification System	1990–2019	Information on all births in WA, including maternal demographics, infant characteristics, and pregnancy, labour and birth information
	School enrolments and suspensions	1990–2019 2008–2019	Students enrolled in WA public schools, including details of school enrolments, attendance rates, and school suspension records.
WA Police Force	Offences	2007–2019	Crime incidents are reported to the police and associated offences and offenders.
Department of Justice	Custodial stays	Juvenile: 2001–2019; Adult: 2008–2019	Custodial stays within the juvenile and adult justice systems.

<sup>a</sup> Due to the commencement of the National Disability Insurance Scheme, the Australian Federal Government governs data beyond 2019 and the data is not linked within WA.

comprised the No Contact Cohort. The CP Contact Cohort was derived from those who were in the child protection client dataset but with no recorded periods of care. The OHC Cohort was those who were in the child protection client dataset and had one or more periods of care totalling six or more months in duration. The minimum cut-off of six months was selected to include as many children and young people with care-experiences as possible, while eliminating cases where OHC might have been a short-term option for reasons other than child maltreatment (e.g., unexpected parent hospitalisation).

### 2.3. Variables

#### 2.3.1. Cohort demographics

Birth registration data were used to determine participant sex. Participants' Indigenous status was available within the health datasets and was derived using algorithms that reconcile inconsistencies in Indigenous status indicators across multiple linked datasets (Christensen et al., 2014). The Australian Bureau of Statistics' (ABS) Index of Relative Socioeconomic Advantage and Disadvantage (IRSAD) and Australian Statistical Geography Standard (ASGS), available within the Midwives Notification System dataset, were used as an indicator of socioeconomic conditions, and geographical location with WA at birth (ABS, 2018, 2021). Five ordinal categories were constructed using the IRSAD (1 = least socioeconomic disadvantage, 5 = most socioeconomic disadvantage). The five ASGS categories were collapsed into three categories (city, regional, remote) for analysis.

#### 2.3.2. Child protection involvement

For the OHC and CP Contact Cohorts, indicators of child protection involvement were explored using the Child Protection and Family Support datasets. The indicators explored were the number of child safety and wellbeing notifications recorded per member of each cohort, the age of first notifications, and the age at which members of the OHC Cohort were first placed in care.

#### 2.3.3. Health

The health indicators selected for this study were derived from the hospital morbidity and emergency department datasets and related to health system contacts via hospital admission or emergency department (ED) presentation. Variables included: the number of ED presentations and hospital admissions per participant and the primary health condition (mental and physical) associated with all hospital admissions and ED presentations. Health conditions were classified according to WHO ICD-9 and ICD-10 codes, and the most prevalent reasons for ED presentation and hospital admissions among the OHC group were analysed. Conditions associated with potentially preventable hospitalisations were grouped into three categories: vaccine-preventable conditions, acute conditions, and chronic conditions, according to criteria suggested by Falster and Jorm (2017).

#### 2.3.4. Disability

Rates of disability among the three cohort groups and the primary disability diagnosis of cohort members were explored using the Disability service client dataset. The 53 primary disabilities found within the dataset were grouped according to the six categories identified within the ABS's Survey of Disability, Aging and Carers (ABS, 2019). The prevalence of each disability within the cohorts was calculated as a percentage. The six categories were: sensory and speech (sight, hearing, speech), intellectual (difficulty learning or understanding), physical (including breathing difficulties, chronic or recurrent pain, incomplete use of limbs and more), psychosocial (including nervous or emotional conditions, mental illness, memory problems, and social or behavioural difficulties), head injury, stroke or acquired brain injury, and other (restrictions in everyday activities due to other long-term conditions or ailments; ABS, 2019).

#### 2.3.5. Education

School enrolment, attendance, and suspension data were used to derive education indicators. The proportion of young people in each cohort who have ever been enrolled at a government school was calculated. A binary variable to reflect the number of schools attended was derived. One group included those who had been enrolled in 1–3 schools during their schooling career, and the other included those who had been enrolled in four or more schools. Average attendance rates per year of schooling were calculated (i.e., the number of days attended each year as a percentage of the number of school days per year). The proportion of young people in each cohort who have ever received a suspension from school, the number of suspensions incurred per year, and the length of suspensions (in days) were also explored.

#### 2.3.6. Housing

Applications to the public housing system and public housing tenancies were the indicators of housing outcomes and were explored using the housing customers, applications, households, and tenancies datasets. The proportion of each cohort involved in an application for public housing and who have been a household member in public housing tenancy were calculated. Binary variables were derived to explore the number of applications and tenancies members of each cohort have been involved in during their lifetime: those involved in 1–2 applications or tenancies and those involved in 3 or more applications or tenancies.

#### 2.3.7. Criminal justice

The offences and custodial stays datasets were used to explore criminal justice system involvement and to derive indicators of offending. The prevalence (as a percentage) of offending among the three cohorts was estimated using police records, along with participant age when their first offence was recorded. The types of offences and their prevalence among the cohorts were also examined. Offences were classified into the following six broad categories using the Australian and New Zealand Standard Offence

Classification (ANZOC) framework for classifying criminal behaviour (ABS, 2011): property, against person, drugs, transport, public order, and other (e.g., weapons offences, breaches of custodial order; ref). The number of young people with a custodial stay per cohort and time spent in custody were derived. Time in custody was calculated as a cumulative total and expressed as total time spent on remand (i.e., time in custody without a sentence issued by the courts) and total time in sentenced detention in both the juvenile and adult justice systems.

## 2.4. Analysis

Descriptive statistics were calculated for the selected indicator variables for each cohort. For categorical indicators, rates of each category present reported, expressed as a percentage of the cohort (i.e.,  $n$  with indicator present/ $n$  in cohort). Continuous variables (e.g., school attendance rate, age of first placement in care, age of first recorded offence) were tested for skewness. If data were normally distributed, then means and standard deviations were reported. Medians and interquartile ranges (IQRs) were reported for skewed data.

Logistic regression (for nominal categories), the Mann-Whitney  $U$  test (non-normally distributed continuous variables), and independent samples  $t$ -test (normally distributed continuous variables) were used to explore differences between the OHC Cohort and the two comparison cohorts. Estimates of effect size, odds ratios (binary variables) and Cohen's  $d$  (continuous variables), were the primary statistics of interest so that between-group differences were interpreted in light of their practical significance rather than statistical significance. Odds ratios were interpreted as either negligible (OR < 1.67), small (OR = 1.67), medium (OR = 3.47) or large (OR  $\geq$  6.71; Chen et al., 2010). Cohen's  $d$  was interpreted as either negligible ( $d < 0.2$ ), small ( $d = 0.2$ ), medium ( $d = 0.5$ ) or large ( $d \geq 0.8$ ; Cohen, 1988). Statistical significance was calculated, however due to the exploratory in nature significance was set at  $p < 0.05$  in favour of a more conservative error rate.

## 3. Results

### 3.1. Participants

The birth cohort contained records for 414,266 individuals born in WA from 1993 to 2008. The smallest comparison group in this study was the OHC Cohort ( $n = 6526$ ). The CP Contact Cohort and No Contact Cohort sample sizes were 78,095 and 329,645, respectively. The complete characteristics of the three cohort groups are presented in Table 2. Characteristics of note are the increased proportion of Aboriginal children and young people in the OHC Cohort (40.7 %) relative to both comparison groups (2.3 % - 21.8 %), and the high rates of socioeconomic disadvantage among the OHC Cohort: 70.6 % fell within the two classification bands of most disadvantage.

#### 3.1.1. Child protection involvement

On average, children and young people in the OHC Cohort were 4.9 years younger than those in the CP Contact Cohort when concerns for safety and wellbeing were first notified to child protection services. First notifications for the OHC Cohort occurred at an average age of 3.02 years (SD = 3.31) and 7.90 years (SD = 4.79) for the CP Contact Cohort. Notifications to child protection also occurred more frequently for the OHC Cohort, with a majority (90.2 %) being the subject of two or more notifications, compared to 47.6 % of the CP Contact Cohort. On average, children and young people in the OHC Cohort were placed in care for the first time at 5.04 years (SD = 4.41), and the duration of time spent in care ranged from 6 months to 18 years (mean = 6.25 years, SD = 4.46).

**Table 2**

Characteristics of the study population.

Characteristics	OHC		CP Contact		No Contact	
	N = 6526		N = 78,095		N = 329,645	
	N	%	N	%	N	%
Sex						
Male	3322	50.9	39,142	50.1	170,070	51.6
Female	3204	49.1	38,953	49.9	159,573	48.4
Aboriginal status						
Aboriginal	2622	40.2	17,048	21.8	7712	2.3
Non-aboriginal	3875	59.4	61,017	78.1	321,854	97.6
Location						
Cities	4071	62.4	46,033	58.9	233,017	70.7
Regional	1462	22.4	20,970	26.9	69,742	21.2
Remote	949	14.5	11,048	14.2	26,532	8.1
Socioeconomic conditions						
1 (most disadvantage)	3045	46.7	29,977	38.4	60,158	18.3
2	1557	23.9	20,041	25.7	68,819	20.9
3	978	15.0	13,478	17.3	65,938	20.0
4	604	9.3	9536	12.2	70,246	21.3
5 (least disadvantage)	297	4.6	4996	6.4	63,860	19.4

### 3.2. Health

#### 3.2.1. ED presentations

ED presentations were more prevalent among the OHC Cohort (96 % had at least one ED presentation), followed by the CP Contact Cohort (94 %) and the No Contact Cohort (83 %). The odds of ED presentation among the OHC Cohort were significantly higher than for both comparison cohorts, but negligible in size when compared to the CP Contact Cohort (OR = 1.46, 95 % CI = 1.28–1.65) and medium in relation to the No Contact Cohort (OR = 5.03, 95 % CI = 4.44–5.69). The OHC Cohort had the most ED presentations per person (median = 10, IQR = 14), which was slightly higher than the CP Contact Cohort (median = 8, IQR = 11;  $d = 0.22$ , 95 % CI = 0.19–0.25), and considerably higher again than the No Contact Cohort (median = 5, IQR = 7;  $d = 1.22$ , 95 % CI = 1.19–1.24). The primary reasons for ED presentations for all cohorts are reported in Table 3.

#### 3.2.2. Hospital morbidity

Records indicated 91 % of the OHC Cohort had at least one hospital admission, compared to 89 % of the CP Contact Cohort and 82 % of the No Contact Cohort. The odds of the OHC Cohort having at least one hospital admission were significantly higher than both comparison cohorts but negligible in size when compared to the CP Contact Cohort (OR = 1.39, 95 % CI = 1.27–1.52) and small compared to the No Contact Cohort (OR = 2.41, 95 % CI = 2.21–2.63). The OHC Cohort had the most hospital admissions per person (median = 4; IQR = 5), followed by the CP Contact Cohort (median = 3, IQR = 3) and then the No Contact Cohort (median = 2, IQR = 3). Testing indicated a significant but negligible difference in the number of admissions per person when comparing the OHC and CP Contact Cohorts ( $d = 0.19$ , 95 % CI = 0.16–0.22) and a significant difference of medium magnitude when comparing the OHC and No Contact Cohorts ( $d = 0.55$ , 95 % CI = 0.52–0.57). The primary reasons for all hospitalisations among the cohorts are reported in

**Table 3**

Reasons for emergency department presentations among the three cohorts.

	OHC	CP Contact	No Contact	Between-group comparisons			
	N = 6526	N = 78,095	N = 329,645	OHC vs. Contact		OHC vs. No Contact	
	N (%)	N (%)	N (%)	OR	95%CI	OR	95%CI
<b>Mental health</b>							
Non-accidental injuries, poisoning, other external cause	4832 (74.0)	52,971 (67.8)	178,310 (54.1)	1.3***	1.3–1.4	2.4***	2.3–2.6
Substance use	816 (12.5)	5282 (6.8)	748 (2.3)	2.0***	1.8–2.1	6.1***	5.7–6.6
Stress and adjustment	813 (12.5)	5720 (7.3)	6431 (2.0)	1.8***	1.7–1.9	7.1***	6.6–7.7
Hyperkinetic disorders	423 (6.5)	1613 (2.1)	1452 (0.4)	3.3***	2.9–3.7	15.7***	14.0–17.1
Self-harm	405 (6.2)	2437 (3.1)	2172 (0.7)	2.0***	1.8–2.3	10.0***	8.9–11.1
Mood disorders	149 (2.3)	1554 (2.0)	2109 (0.6)	1.1	1.0–1.4	3.6***	3.1–4.3
Schizophrenia and Psychosis	128 (2.0)	630 (0.8)	604 (0.2)	2.5***	2.0–3.0	10.9***	9.0–13.2
Personality disorders	120 (1.8)	582 (0.7)	391 (0.1)	2.5***	2.0–3.0	15.8***	12.8–19.4
Pervasive and specific developmental disorders	8 (0.1)	63 (0.1)	52 (0.0)	1.5	0.7–3.2	7.8***	3.7–16.4
<b>Health conditions</b>							
Diseases of the circulatory, respiratory, digestive systems	3178 (48.7)	33,079 (42.4)	96,310 (29.2)	1.3***	1.2–1.54	2.3***	2.2–2.4
Factors influencing health status and contact with health services	2737 (41.9)	24,673 (31.6)	53,117 (16.1)	1.6***	1.5–1.6	3.8***	3.6–3.9
Symptoms, signs and abnormal clinical and lab findings, NEC	2610 (40.0)	27,878 (35.7)	80,125 (24.3)	1.2***	1.1–1.3	2.1***	2.0–2.2
Infections/communicable diseases	2243 (34.4)	23,248 (29.8)	71,570 (21.7)	1.2***	1.2–1.3	1.9***	1.8–2.0
Diseases of the skin or musculoskeletal system	2013 (30.8)	19,860 (25.4)	45,752 (13.9)	1.3***	1.2–1.4	2.8***	2.6–2.9
Diseases of the eye and ear	1039 (15.9)	11,202 (14.3)	28,849 (8.8)	1.1***	1.1–1.2	2.0***	1.8–2.1
Diseases of the genitourinary system	813 (12.5)	10,248 (13.1)	22,488 (6.8)	0.9	0.9–1.0	1.9***	1.8–2.1
Diseases of the nervous system	358 (5.5)	3290 (4.2)	7558 (2.3)	1.3***	1.2–1.5	2.5***	2.2–2.8
Maltreatment	298 (4.6)	1296 (1.7)	481 (0.1)	2.8***	2.5–3.2	32.7***	28.3–37.9
Pregnancy, childbirth, deliveries and the puerperium	239 (3.7)	2971 (3.8)	2101 (0.6)	1.0	0.8–1.1	6.0***	5.3–6.9
Endocrine, nutritional, blood diseases and metabolic diseases	166 (2.5)	1646 (2.1)	4197 (1.3)	1.2*	1.0–1.4	2.0***	1.7–2.4
Certain conditions originating in the perinatal period	80 (1.2)	514 (0.7)	1853 (0.6)	1.9***	1.5–2.4	2.2***	1.7–2.7
Accidental injuries	74 (1.1)	614 (0.8)	944 (0.3)	1.4**	1.1–1.8	4.0***	3.1–5.1
Congenital anomalies	23 (0.4)	152 (0.2)	332 (0.1)	1.8**	1.2–2.8	3.5***	2.3–5.4
Assault	10 (0.2)	74 (0.1)	12 (0.0)	1.6	0.8–3.1	42.2***	18.2–97.6
Neoplasms - malignant/benign	14 (0.2)	176 (0.2)	485 (0.1)	1.0	0.5–1.6	1.5	0.9–2.5

Notes. OR = Odds ratio; OR interpretation: OR < 1.68: negligible effect, OR = 1.68: *small effect*, OR = 3.47: *medium effect*, OR = 6.71: *large effect*.

\* Logistic regression significant at  $p \leq 0.05$ .

\*\* Logistic regression significant at  $p \leq 0.01$ .

\*\*\* Logistic regression significant at  $p \leq 0.001$ .

**Table 4**  
Reasons for hospitalisations among the three cohort groups.

	OHC	CP Contact	No Contact	Between group comparisons			
	N = 6526	N = 78,095	N = 329,645	OHC vs. Contact		OHC vs. No Contact	
	N (%)	N (%)	N (%)	OR	95%CI	OR	95%CI
<b>Mental health</b>							
Non-accidental injuries, poisoning & other external cause	2411 (36.9)	23,967 (30.7)	65,368 (19.8)	1.3***	1.3–1.4	2.4***	2.2–2.5
Substance use	757 (11.6)	5510 (7.1)	5478 (1.7)	1.7***	1.6–1.9	7.8***	7.2–8.4
Stress and adjustment	441 (6.8)	3109 (4.0)	3732 (1.1)	1.8***	1.6–1.9	6.3***	5.7–7.0
Self-harm	358 (5.5)	2728 (3.5)	3087 (0.9)	1.6***	1.4–1.8	6.1***	5.5–6.9
Hyperkinetic disorders	252 (3.9)	1032 (1.3)	852 (0.3)	3.0***	2.6–3.4	15.5***	13.4–17.9
Mood disorders	188 (2.9)	1895 (2.4)	2528 (0.8)	1.2*	1.0–1.4	3.8***	3.3–4.5
Pervasive and specific developmental disorders	187 (2.9)	820 (1.1)	1094 (0.3)	2.8***	2.4–3.3	8.9***	7.6–10.4
Personality disorders	154 (2.4)	998 (1.3)	1036 (0.3)	1.9***	1.6–2.2	7.7***	6.5–9.1
Schizophrenia or psychosis	137 (2.1)	851 (1.1)	928 (0.3)	1.9***	1.6–2.3	7.6***	6.3–9.1
<b>Health conditions</b>							
Factors influencing health status and contact with health services	4785 (73.3)	50,887 (65.2)	180,686 (54.8)	1.5***	1.4–1.6	2.3***	2.1–2.4
Diseases of the circulatory, respiratory, digestive systems	3786 (58.0)	41,687 (53.4)	148,131 (44.9)	1.2***	1.1–1.3	1.7***	1.6–1.8
Infections/communicable diseases	2774 (42.5)	25,218 (32.3)	56,485 (17.1)	1.5***	1.5–1.6	3.6***	3.4–3.8
Certain conditions originating in the perinatal period	2708 (41.5)	26,244 (33.6)	105,458 (32.0)	1.4***	1.3–1.5	1.5***	1.4–1.6
Symptoms, signs and abnormal clinical and lab findings, NEC	2567 (39.3)	23,694 (30.3)	59,847 (18.2)	1.5***	1.4–1.6	2.9***	2.8–3.1
Accidental injuries	2249 (34.5)	21,613 (27.7)	58,333 (17.7)	1.4***	1.3–1.4	2.4***	2.3–2.6
Diseases of the skin or musculoskeletal system	1833 (28.1)	15,933 (20.4)	38,427 (11.7)	1.5***	1.4–1.6	3.0***	2.8–3.1
Diseases of the eye and ear	1723 (26.4)	14,633 (18.7)	42,101 (12.8)	1.6***	1.5–1.6	2.4***	2.3–2.6
Endocrine, nutritional, blood diseases and metabolic diseases	1487 (22.8)	13,439 (17.2)	25,765 (7.8)	1.4***	1.3–1.5	3.5***	3.3–3.7
Diseases of the genitourinary system	928 (14.2)	10,673 (13.7)	29,681 (9.0)	1.0	1.0–1.1	1.7***	1.6–1.8
Congenital anomalies	817 (12.5)	7467 (9.6)	30,024 (9.1)	1.3***	1.2–1.5	1.4***	1.3–1.5
Diseases of the nervous system	691 (10.6)	6022 (7.7)	22,268 (6.8)	1.4***	1.3–1.5	1.6***	1.5–1.8
Maltreatment	771 (11.8)	1795 (2.3)	739 (0.2)	5.7***	5.2–6.2	59.6***	53.7–66.2
Pregnancy, childbirth, deliveries and the puerperium	548 (8.4)	7493 (9.6)	7395 (2.2)	0.9***	0.8–0.9	4.2***	3.9–4.7
Assault	314 (4.8)	1703 (2.2)	1026 (0.3)	2.3***	2.0–2.6	16.2***	14.2–18.4
Neoplasms - malignant/benign	116 (1.8)	2029 (2.6)	9725 (3.0)	0.7***	0.6–0.8	0.6***	0.5–0.7

Notes. OR = Odds ratio; OR interpretation: OR < 1.68: negligible effect, OR = 1.68: *small effect*, OR = 3.47: **medium effect**, OR = 6.71: **large effect**.

\*Logistic regression significant at  $p \leq 0.05$ .

\*\*Logistic regression significant at  $p \leq 0.01$ .

\*\*\*Logistic regression significant at  $p \leq 0.001$ .

**Table 4.**

### 3.2.3. Preventable hospitalisations

The OHC Cohort had significantly increased odds for preventable hospitalisations relative to both comparison cohorts across all three health condition groupings ( $p \leq 0.001$ ). Compared to the CP Contact Cohort, the increase in odds was negligible to small (OR = 1.24–1.94) and small to medium compared to the No Contact Cohort (OR = 2.80–4.54; see Table 5).

**Table 5**  
Preventable hospitalisations among the three cohort groups.

	OHC	CP Contact	No Contact	Between groups comparisons			
	N = 6526	N = 78,095	N = 329,645	OHC vs. Contact		OHC vs. No Contact	
	N (%)	N (%)	N (%)	OR	95%CI	OR	95%CI
Vaccine-preventable conditions	234 (3.6)	1472 (1.9)	2623 (0.8)	1.9***	1.7–2.2	4.6***	4.0–5.3
Chronic conditions	566 (8.7)	5277 (6.8)	8117 (2.5)	1.3***	1.2–1.4	3.8***	3.4–4.1
Acute conditions	1358 (20.8)	13,646 (17.5)	18,284 (8.6)	1.2***	1.2–1.3	2.8***	2.6–3.0

Notes. OR = Odds ratio; OR interpretation: OR < 1.68: negligible effect, OR = 1.68: *small effect*, OR = 3.47: **medium effect**, OR = 6.71: **large effect**.

\*\*\* Logistic regression significant at  $p \leq 0.001$ .

### 3.3. Disability

More members of the OHC Cohort (12.2 %;  $n = 793$ ) were in the disability services dataset than the CP Contact Cohort (4.9 %;  $n = 3810$ ) and the No Contact Cohort (2.3 %;  $n = 12,021$ ). There was a small significant difference in the odds of having a disability between the OHC Cohort and the CP Contact Cohort ( $p \leq 0.001$ ; OR = 2.70, 95 % CI = 2.49–2.92), and a statistically significant difference of medium magnitude compared to the No Contact Cohort ( $p \leq 0.001$ ; OR = 6.01, 95 % CI = 5.56–6.49). The OHC cohort had significantly increased odds of all disability types compared to the CP Contact Cohort, with most differences being small in magnitude (OR = 2.00–3.34), except for head injury, stroke or acquired brain injury where a medium increase in odds was detected (OR = 3.34, 95 % CI = 2.43–6.38). Compared to the No Contact Cohort, the OHC Cohort had a significant, large increase in odds of intellectual disability and head injury, stroke or acquired brain injury ( $p \leq 0.001$ ; OR = 10.43–11.61) and a significant, medium increase in odds of a physical, sensory or ‘other’ disability ( $p \leq 0.001$ ; OR = 4.69–6.35). The types of primary disability and associated odds ratios are presented in Table 6.

### 3.4. Education

#### 3.4.1. School enrolments

Data were available for 91.8 % of the OHC Cohort ( $n = 5996$ ), 87.4 % of the CP Contact Cohort ( $n = 68,302$ ) and 64.2 % of the No Contact Cohort ( $n = 239,645$ ). A majority of those with missing school enrolment data were likely to have only ever been enrolled at non-government schools. When examining the number of government schools participants have attended, the OHC Cohort had significantly greater odds of being enrolled in four or more schools than those in both comparison cohorts ( $p \leq 0.001$ ); a difference that was medium in magnitude when compared to the CP Contact Cohort (OR = 2.59, 95 % CI = 2.46–2.74), but large compared to the No Contact Cohort (OR = 11.78, 95 % CI = 11.16–12.44). Enrolment rates for all cohorts are presented in Table 7.

#### 3.4.2. School attendance

The difference in school attendance rates was significant ( $p \leq 0.05$ ) but negligible ( $d = 0.01$ – $0.23$ ) when comparing the OHC Cohort to the CP Contact Cohort across all year groups, with the exceptions of Years 2 (starting age 6.5–7.5), 3 (starting age 7.5–8.5), 7 (starting age 11.5–12.5), and 12 (starting age 16.5–17.5) where attendance rates did not differ. Comparisons of school attendance rates between the OHC Cohort and the No Contact Cohort revealed significantly lower attendance rates for the OHC Cohort ( $p \leq 0.001$ ), with large effect sizes ( $d = 0.72$ – $1.41$ ) across all year groups. The greatest discrepancy in attendance rates between the OHC Cohort and both comparison cohorts occurred at Year 9 (starting age 13.5–14.5 years). Yearly attendance rates and between-group comparisons are presented in Table 8.

#### 3.4.3. School suspensions

Data indicated that 47.9 % of the OHC Cohort had been suspended from a government school at a median rate of two suspensions per year (IQR = 2.67). Around 32 % of the CP Contact Cohort and 7.6 % of the No Contact Cohort have received government school suspensions, at respective median rates of 1.75 and 1.00 suspensions per year. Mann-Whitney testing indicated differences in yearly suspension rates for the OHC Cohort compared to both comparison cohorts were significant and bordering on small ( $d = 0.17$ – $0.19$ ). Members of the OHC Cohort have been suspended for more days per year (median = 4.39, IQR = 6.59) than the CP Contact Cohort (median = 3.5, IQR = 4.83) and the No Contact Cohort (median = 2.00, IQR = 2.67). Significance testing indicated suspension times per year were significantly longer for the OHC cohort than for both comparison cohorts ( $p \leq 0.001$ ), a difference that was negligible between the CP Contact Cohort ( $d = 0.16$ ), but moderate between the No Contact cohort ( $d = 0.66$ ).

**Table 6**

Primary disability types among the three cohort groups.

Type of disability	OHC	CP Contact	No Contact	Between groups comparisons			
	N = 6526	N = 78,095	N = 329,645	OHC vs. Contact		OHC vs. No Contact	
	N (%)	N (%)	N (%)	OR	95%CI	OR	95%CI
Intellectual disability	530 (8.1)	2013 (2.6)	2771 (0.8)	3.3***	3.0–3.7	10.4***	9.5–11.5
Psychosocial	247 (3.8)	1503 (1.9)	3939 (1.2)	2.0***	1.7–2.3	3.3***	2.9–3.7
Physical	114 (1.7)	465 (0.6)	1027 (0.3)	3.0***	2.4–3.6	5.7***	4.7–6.9
Sensory	46 (0.7)	265 (0.3)	498 (0.2)	2.1***	1.5–2.8	4.7***	3.5–6.3
Head injury, stroke or acquired brain injury	22 (0.3)	67 (0.1)	96 (0.0)	3.9***	2.4–6.4	11.6***	7.3–18.5
Other	118 (1.8)	497 (0.6)	953 (0.3)	2.9***	2.4–3.5	6.4***	5.2–7.7

Notes. Total  $n$  per column is greater than the  $n$  with a disability per cohort as more than one primary disability was recorded for some participants; Notes. OR = Odds ratio; OR interpretation: OR < 1.68: negligible effect, OR = 1.68: *small effect*, OR = 3.47: *medium effect*, OR = 6.71: *large effect*.

\*Logistic regression significant at  $p \leq 0.05$ .

\*\*Logistic regression significant at  $p \leq 0.01$ .

\*\*\*Logistic regression significant at  $p \leq 0.001$ .



**Table 7**  
The number of government schools in which participants have been enrolled.

Schools enrolled	OHC	CP Contact	No Contact	Between-group comparison			
	N = 5996	N = 68,302	N = 239,645	OHC vs. Contact		OHC vs. No Contact	
	N (%)	N (%)	N (%)	OR	95%CI	OR	95%CI
1–3	3494 (58)	53,543 (78)	199,463 (94)	0.4	0.37–0.41	0.08	0.08–0.09
4 or more	2498 (42)	14,759 (22)	12,102 (6)	<b>2.6***</b>	2.5–2.7	<b>11.8***</b>	11.2–12.4

Notes. School attendance is based on enrolments in public schools only; OR = Odds ratio; OR interpretation: OR < 1.68: negligible effect, OR = 1.68: *small effect*, OR = 3.47: *medium effect*, OR = 6.71: *large effect*.

\*Logistic regression significant at  $p \leq 0.05$ .

\*\*Logistic regression significant at  $p \leq 0.01$ .

\*\*\*Logistic regression significant at  $p \leq 0.001$ .

### 3.5. Housing

#### 3.5.1. Applications for public housing

A total of 82.1 % of the OHC Cohort have been a household member in an application for public housing, compared to 53.6 % of the CP Contact Cohort and 8.0 % of the No Contact Cohort. Compared to both comparison cohorts, the odds of ever being a household member on an application for public housing were significantly higher for the OHC Cohort and medium in magnitude compared to the CP Contact Cohort ( $p \leq 0.001$ ; OR = 3.98, 95 % CI = 3.73–4.24) and large in magnitude compared to the No Contact Cohort ( $p \leq 0.001$ , OR = 53.09, 95 % CI = 49.77–56.63). The odds of being involved in three or more applications for public housing were also significantly larger for the OHC Cohort compared to both comparison cohorts ( $p \leq 0.001$ ); again, with a large difference in relation to the No Contact Cohort (OR = 8.9, 95 % CI = 8.32–9.46), and a medium difference compared to the CP Contact Cohort (OR = 2.1, 95 % CI = 3.73–4.24). The number of applications young people have been involved in is presented in [Table 9](#).

#### 3.5.2. Public housing tenancies

More members of the OHC Cohort (61.6 %) have been tenants of a public housing dwelling across their lifespan than members of both comparison cohorts (CP Contact Cohort = 35.6 %, No Contact Cohort = 3.4 %). Compared to both comparison cohorts, the odds of having at least one public housing tenancy were significantly higher for the OHC Cohort compared to the Contact Cohort ( $p \leq 0.001$ ; OR = 2.90, 95 % CI = 2.75–3.06) and the No Contact Cohort ( $p \leq 0.001$ ; OR = 45.75, 95 % CI = 43.48–48.26). There was a small increase in odds of being involved in three or more public housing tenancies for the OHC Cohort in relation to the CP Contact Cohort ( $p \leq 0.001$ ; OR = 2.4, 95 % CI = 2.3–2.6), and a very large increase in odds relative to the No Contact Cohort ( $p \leq 0.001$ ; OR = 79.7, 95 % CI = 73.4–86.5). The number of public housing tenancies per cohort is listed in [Table 9](#).

### 3.6. Police and criminal justice

#### 3.6.1. Offending

The proportion of the OHC Cohort (38.9 %) with an offence registered by WA Police was greater than that of the CP Contact Cohort (26.3 %) and the No Contact Cohort (5.8 %). Logistic regression modelling indicated the odds of having a registered offence were significantly higher for the OHC Cohort relative to the comparison cohorts ( $p \leq 0.001$ ), with small odds relative to the CP Contact Cohort (OR = 1.78, 95 % CI = 1.69–1.88) and large odds compared to the No Contact Cohort (OR = 10.40, 95 % CI = 9.88–10.96). On average, members of the OHC Cohort were significantly younger than members of the CP Contact Cohort ( $d = 0.34$ , 95 % CI = 0.03–0.38) and No Contact Cohort ( $d = 0.85$ , 95 % CI = 0.80–0.89) at the time of first registered offence (mean age in years = 14.79, 15.88 and 17.30 respectively;  $p \leq 0.001$ ). [Table 10](#) details the types of first registered offences committed by the birth cohort.

#### 3.6.2. Corrections

Juvenile Justice custodial data revealed that compared to both comparison cohorts, the OHC Cohort had significantly higher odds of spending time in custody on remand before the age of 18 years; odds were moderate in magnitude relative to the CP Contact Cohort (OR = 3.89, 95 % CI = 3.57–4.24) and very large compared to the No Contact Cohort (OR = 142.50, 95 % CI = 124.36–163.29). The odds of the OHC Cohort ( $n = 228$ ; 3.5 %) having received a sentence of detention before the age of 18 were also significantly higher than the two comparison groups ( $p < 0.001$ , OR = 4.04–216.94). Regarding time in custody as an adult, again, the OHC Cohort has significantly higher odds for time in custody on remand than the two comparison cohorts ( $p \leq 0.001$ , OR = 2.28–46.80). Likewise, the odds that the OHC Cohort had spent time in custody as a sentenced adult prisoner were significantly higher than the two comparison cohorts ( $p \leq 0.001$ , OR = 2.25–38.26). Proportions and between-group comparisons are presented in [Table 11](#).

On average, members of the OHC Cohort have been placed on remand for longer than members of the two comparison cohorts in both the juvenile and adult justice systems ( $p < 0.001$ ). Differences in the cumulative total time spent on remand were small when comparing the OHC Cohort to the CP Contact Cohort ( $d = 0.2$ –0.3), but larger when comparing the OHC Cohort to the No Contact Cohort ( $d = 0.5$ ). While the average total sentenced time in custody was larger for the OHC Cohort than the two comparison cohorts, the differences were not statistically significant (see [Table 12](#)).

**Table 8**  
School attendance rates by school year among the three cohort groups.

Grade	OHC			CP Contact			No Contact			Between-group comparison <sup>a</sup>			
	N = 5996			N = 68,302			N = 239,645			OHC vs. Contact		OHC vs. No Contact	
	N	Median	IQR	N	Median	IQR	N	Median	IQR	Cohen's <i>d</i>	95 % CI	Cohen's <i>d</i>	95 % CI
Kindergarten	1958	88.5	24.9	15,830	91.7	16.8	61,839	94.9	8.6	0.23***	0.19–0.28	1.02***	0.97–1.06
Pre-primary <sup>b</sup>	2652	88.3	19.8	20,808	89.6	15.5	75,451	93.4	8.5	0.15***	0.11–0.19	0.87***	0.83–0.91
Yr 1	3271	91.2	18.0	26,728	91.6	13.3	98,587	95.2	7.1	0.14**	0.10–0.17	0.90***	0.86–0.93
Yr 2	3575	92.1	14.8	29,872	92.1	12.3	105,353	95.4	6.4	0.09	0.06–0.13	0.85***	0.81–0.88
Yr 3	3751	92.5	14.4	33,354	92.5	12.0	111,472	95.7	6.3	0.08	0.05–0.11	0.81***	0.78–0.85
Yr 4	3962	92.7	13.1	36,682	92.2	12.0	117,717	95.4	6.4	0.02**	0.01–0.05	0.72***	0.68–0.75
Yr 5	4167	92.8	12.7	40,034	92.1	12.3	122,219	95.3	6.6	0.01***	0.02–0.05	0.72***	0.69–0.75
Yr 6	3973	92.7	13.4	40,272	91.8	12.8	117,050	95.0	6.9	0.04***	0.01–0.07	0.81***	0.77–0.84
Yr 7 <sup>c</sup>	3615	90.3	19.4	39,897	90.5	15.6	97,508	94.7	7.4	0.11	0.08–0.15	0.92***	0.89–0.96
Yr 8	3321	85.8	29.4	39,085	87.4	20.4	86,688	93.2	8.9	0.18***	0.15–0.22	1.23***	1.19–1.26
Yr 9	3066	81.0	42.9	39,936	84.2	27.0	85,808	92.0	10.0	0.23***	0.20–0.27	1.41***	1.37–1.45
Yr 10	2659	79.1	47.7	39,152	82.3	31.4	85,644	91.4	11.3	0.20***	0.16–0.24	1.30***	1.26–1.34
Yr 11	1871	82.0	39.5	30,232	84.5	29.0	75,206	92.5	11.0	0.16***	0.12–0.21	1.08***	1.03–1.13
Yr 12	1017	86.5	28.1	18,752	86.6	22.0	57,922	92.3	10.7	0.08	0.01–0.14	0.82***	0.75–0.88

Notes. Cohen's *d* interpretation:  $d < 0.2$ : negligible effect,  $d = 0.2$ : *small effect size*,  $d = 0.5$ : **medium effect size**,  $d = 0.8$ : **large effect size**.

<sup>a</sup>Mann-Whitney *U* used to test for significant between-group differences in median school attendance rates.

<sup>b</sup>Pre-primary is the first year of compulsory school in WA.

<sup>c</sup>Year 7 is the first year of high school in WA.

\*Mann-Whitney test significant at  $p \leq 0.05$ .

\*\*Mann-Whitney test significant at  $p \leq 0.01$ .

\*\*\*Mann-Whitney test significant at  $p \leq 0.001$ .

**Table 9**  
Number of public housing applications and tenancies among the three cohort groups.

	OHC	CP Contact	No Contact	Between groups comparison			
	N = 6526	N = 78,095	N = 329,645	OHC vs. Contact		OHC vs. No Contact	
	N (%)	N (%)	N (%)	OR	95%CI	OR	95%CI
Applications (n)							
1–2	2031 (31.1)	23,330 (29.9)	22,151 (6.7)	1.1	1.0–1.1	<b>6.3***</b>	5.9–6.6
3 or more	3328 (51.0)	18,517 (23.7)	4091 (1.2)	<b>2.1***</b>	1.9–2.2	<b>8.9***</b>	8.3–9.5
Tenancies (n)							
1–2	2595 (39.8)	19,776 (25.3)	10,014 (3.0)	<b>1.9***</b>	1.8–2.0	<b>21.1***</b>	20.0–22.2
3 or more	1425 (21.8)	8036 (10.3)	1152 (0.3)	<b>2.4***</b>	1.3–1.5	<b>79.7***</b>	73.4–86.5

Notes. OR = Odds ratio; OR interpretation: OR < 1.68: negligible effect, OR = 1.68: *small effect*, OR = 3.47: **medium effect**, OR = 6.71: **large effect**.  
\*\*\* Logistic regression significant at  $p \leq 0.001$ .

**Table 10**  
Types of first offences registered by WA Police among the three cohort groups.

First registered offence	OHC	CP Contact	No Contact	Between groups comparison			
	N = 6526	N = 78,095	N = 329,645	OHC vs. Contact		OHC vs. No Contact	
	N (%)	N (%)	N (%)	OR	95%CI	OR	95%CI
Property	1474 (22.6)	9799 (12.5)	6232 (1.9)	<b>2.0***</b>	1.9–2.2	<b>15.1***</b>	14.2–16.1
Against person	467 (7.2)	3364 (4.3)	1969 (0.6)	<b>1.7***</b>	1.5–1.9	<b>12.8***</b>	11.6–14.2
Public order	358 (5.5)	3434 (4.4)	2882 (0.9)	<b>1.4***</b>	1.3–1.6	<b>9.7***</b>	8.6–11.0
Other	304 (4.7)	2622 (3.4)	1651 (0.5)	0.9*	0.7–0.9	<b>2.2***</b>	1.9–2.5
Drugs	214 (3.3)	2992 (3.8)	5082 (1.5)	<b>0.7**</b>	0.5–0.9	1.0	0.8–1.3
Transport	56 (0.9)	1029 (1.3)	2825 (0.9)	<b>1.3***</b>	1.1–1.4	<b>6.6***</b>	5.9–7.4

Notes. OR = Odds ratio; OR interpretation: OR < 1.68: negligible effect, OR = 1.68: *small effect*, OR = 3.47: **medium effect**, OR = 6.71: **large effect**.  
\* Logistic regression significant at  $p \leq 0.05$ .  
\*\* Logistic regression significant at  $p \leq 0.01$ .  
\*\*\* Logistic regression significant at  $p \leq 0.001$ .

**Table 11**  
Rates of custodial stays in the juvenile and adult justice systems among the three cohort groups.

	OHC	CP Contact	No Contact	Between groups comparison			
	N = 6526	N = 78,095	N = 329,645	OHC vs. Contact		OHC vs. No Contact	
	N (%)	N (%)	N (%)	OR	95%CI	OR	95%CI
Juvenile justice							
On remand	752 (11.5)	2529 (3.2)	301 (0.1)	<b>3.9***</b>	3.6–4.2	<b>142.5***</b>	124.4–163.3
Custodial sentence	228 (3.5)	694 (0.9)	55 (0.02)	<b>4.0***</b>	3.5–4.7	<b>216.9***</b>	161.4–291.5
Adult justice							
On remand	385 (5.9)	2091 (2.7)	441 (0.1)	<b>2.3***</b>	2.0–2.6	<b>46.8***</b>	40.7–54.0
Custodial sentence	323 (4.9)	1770 (2.3)	448 (0.1)	<b>2.2***</b>	2.0–2.5	<b>38.3***</b>	33.1–44.2

Notes. OR = Odds ratio; OR interpretation: OR < 1.68: negligible effect, OR = 1.68: *small effect*, OR = 3.47: **medium effect**, OR = 6.71: **large effect**.  
\*\*\* Logistic regression significant at  $p \leq 0.001$ .

#### 4. Discussion

This population-based study utilised linked data from government administrative records to describe a range of social and health outcomes for care-experienced young people in a Western Australian birth cohort. Furthermore, the study compared the outcomes of care-experienced young people with those among the birth cohort who had been in contact with child protection services but not placed in care and those who had never had contact with the child protection system. Population-based research presenting whole-of-population outcomes for care-leavers is rare (Chikwava et al., 2021; Paulsen et al., 2022), and this study provided valuable insights into the extent of the vulnerabilities faced by care leavers in WA relative to other groups of young people in the population, and the systems that these young people rely on for support beyond child protection.

Across hospital morbidity and ED presentation data, the overarching pattern that emerged was that care-experienced children and young people are accessing the hospital system to address health concerns (both physical and mental health) at higher rates than other young people in the population. Of note is the considerable likelihood that care-experienced young people have attended ED and been hospitalised due to maltreatment and assault. Comparing care-experienced young people to those without child protection contact yielded concerning findings in this area, with the relative odds of hospitalisation for maltreatment and assault among the care-

**Table 12**  
Cumulative time in custody among the three cohort groups.

	OHC	CP Contact	No Contact	Between groups comparison <sup>a</sup>			
	N = 6526	N = 78,095	N = 329,645	OHC vs. Contact		OHC vs. No Contact	
	Mean (SD)	Mean (SD)	Mean (SD)	Cohen's <i>d</i>	95 % CI	Cohen's <i>d</i>	95 % CI
<b>Juvenile justice</b>							
On remand (mths)	3.0 (4.4)	2.1 (3.4)	1.2 (2.5)	0.3***	0.2–0.3	0.5***	0.3–0.6
Sentenced (mths)	9.2 (9.1)	8.0 (8.4)	8.2 (7.0)	0.1	0.0–0.3	0.1	0.2–0.4
<b>Adult justice</b>							
On remand (mths)	7.6 (7.7)	5.9 (6.9)	4.5 (5.8)	0.2***	0.1–0.3	0.5***	0.3–0.6
Sentenced (mths)	13.7 (16.5)	12.3 (14.5)	9.5 (10.3)	0.1	0.0–0.2	0.3	0.2–0.5

Notes. Cohen's *d* interpretation:  $d < 0.2$ : negligible effect,  $d = 0.2$ : *small effect size*,  $d = 0.5$ : **medium effect size**,  $d = 0.8$ : **large effect size**.

<sup>a</sup> Independent samples *t*-test used to test for significant between-group differences in mean custodial stay times.

\*\*\* Significant at  $p \leq 0.001$ .

experienced cohort reaching 59.6 and 16.2, respectively. These two reasons for hospitalisation also saw notably greater odds for the care experienced group relative to other children and young people who had child protection contact (maltreatment OR 5.7; assault OR 2.3). In some ways, this finding is unsurprising given that maltreatment or physical abuse are common precursors to removing children from families and placement within the OHC system (AIHW, 2022a). However, the finding is a stark reminder that most care-experienced young people have histories of childhood maltreatment and trauma which can adversely affect their development, and health, economic and social outcomes into adulthood (Bunting et al., 2018). It also suggests child protection related policies and programs have not mitigated the early disadvantages of maltreatment.

Compared to most other health indicators, hospitalisations associated with mental health for care-experienced young people were even more concerning. An important finding is that compared to those with no child protection contact, care-experienced young people had a much greater likelihood of hospitalisation for nearly *all* mental health conditions. A very similar pattern emerged for emergency presentations. Mental health conditions with large effect sizes included substance use disorders, hyperkinetic disorders, pervasive and specific developmental disorders, personality disorders, and schizophrenia or psychosis. Findings from this study are similar to those reported in a systematic review involving five other countries (France, Germany, Norway, the UK and the USA; Bronsard et al., 2016), and align with findings of the Australian Childhood Maltreatment Study which found elevated rates of mental health service access among a cross section of young people aged 16–24 who had experienced childhood maltreatment (Pacella et al., 2023).

The very high rates of hospital contacts for hyperkinetic disorders (e.g., ADHD, conduct disorder) among care-experienced young people compared to those without child protection contact (OR 15.5) is also a finding of note. There is ongoing speculation that hyperkinetic disorders (or ADHD) are over-diagnosed (Kazda et al., 2021); however, from a diagnostic perspective, differentiating ADHD from trauma can be difficult. Children with traumatic experiences often meet ADHD criteria, as trauma also impacts specific brain regions that may increase inattention, impulsivity, hyperactivity, and social and learning difficulties, thus leading to similar presentations for trauma and hyperkinetic disorders (Schilpzand et al., 2018). The co-occurrence of each also worsens the effects of the other (Schilpzand et al., 2018). Given most young people in OHC have traumatic experiences, this high level of hospitalisations and hyperkinetic disorders might be as expected. Even so, the magnitude of the difference (OR 15) is considerable and may point to the challenges health professionals experience in making accurate differential diagnoses for children and young people with complex needs, such as many care-experienced young people.

Among the preventable hospitalisations, contact with the hospital system was similar between those with care experience and those with child protection contact. Socioeconomic disadvantage has been associated with health inequalities, and may point to a key factor in understanding the health outcomes among these two groups (Kröger et al., 2015). However, findings that care-experienced young people had a moderate likelihood (OR 3.8–4.6) of attending hospital for a vaccine-preventable or chronic condition compared to those without child protection contact is important for public and primary health care. This is unsurprising as Australian research has shown that many of the issues faced by families with child protection involvement such as substance use, domestic violence mental health and poverty are also barriers to lower vaccination levels (Thomas et al., 2022). Similarly, earlier Australian research showed low vaccination rates among the OHC Cohort, immunisation rates of care-experienced children were as low as 62 %, compared to 84.1–91.6 % among the general population (Nathanson & Tzioumi, 2007). Care-experienced young people have also identified challenges accessing appropriate healthcare while in care and a lack of education and support to access healthcare after leaving care (Smales et al., 2020), which may in some part explain increased hospitalisations for chronic health conditions that might otherwise be managed via timely access to community-based primary healthcare practitioners.

A substantially higher proportion of care-experienced young people in WA have an identified disability compared to other young people in the population with and without child protection contact. Furthermore, while intellectual and psychosocial disabilities were the most common among the OHC cohort, the care-experienced population in WA appear to be at greater odds of having an intellectual disability, head injury, or acquired brain injury as a primary diagnosis than most other disability diagnoses. Other population-level studies presenting findings related to disability among care-experienced young people are scarce. However, these findings do align with a small number of studies that indicate children with disabilities are more likely than their peers to be in OHC, and accesses of disability support pensions tends to be higher among former child welfare services recipients, particularly after leaving OHC (AIHW,

2022b; Octoman et al., 2022; Vinnerljung et al., 2015).

While historically it was commonplace for children with disabilities to be placed in the care of state, this is no longer the case (Cocks et al., 1996; Mendes & Snow, 2014), and other factors have been highlighted that could explain these increased odds of disability among care-experienced young people. For example, this study found that around 70 % of the care-experienced cohort experienced high levels of relative socioeconomic disadvantage from birth, and there is a well-established bi-directional link between disability and poverty: disability can lead to poverty, and poverty can lead to disability (World Health Organization & The World Bank, 2011). Also, much like the previously discussed interrelationship between ADHD and trauma symptoms, a similar argument could be made for rates of psychosocial disabilities, particularly autism, among the care-experience group. The behavioural presentation of autism and post-traumatic stress disorder both can include avoidant behaviour, repetitive behaviours, or difficulty with social cognition (Nietlisbach & Maercker, 2009; Stavropoulos et al., 2018), again highlighting the challenges health professionals experience in making differential diagnoses for children and young people with complex needs. Within the Australian context, these findings highlight the necessity for a coordinated response between child protection services and the National Disability Insurance Agency to ensure adequate supports are in place to address the increased complexity of the needs of young people with a disability as they transition from the OHC system into adulthood.

The high level of public housing use among care leavers found in this study is a harsh reminder of the poverty-related challenges these young people in WA confront across their lifetime and the experiences of housing instability and homelessness. International and national research has consistently found a high degree of housing instability and homelessness among care-leavers (Courtney et al., 2016; Flatau et al., 2015; Muir et al., 2019). For example, over an eight-year period, 29 % of care leavers in the Australian state of Victoria applied for public housing after leaving care, with half of these young people placed on the priority housing list indicating an urgent need (Martin et al., 2021). They also found that of those on the priority list, 91 % received homelessness services. Together with other studies, our findings add to the evidence that many care leavers in Australia rely on the public housing system to prevent homelessness, particularly after leaving care.

Continued use of public housing was also apparent for those who have received child protection services and, again, to a greater extent for those with care experience. As well as an indicator of housing instability, the finding also highlights many young people leaving care have family backgrounds of disadvantage and poverty and a lack of access to parental resources during emerging adulthood compared to their peers (Brackertz et al., 2018; Mendes et al., 2011; Wilkins et al., 2022). Within the Western Australian context, these challenges are compounded by declining rental vacancy rates and associated reductions in housing availability and affordability (National Housing Finance and Investment Corporation, 2023), presenting additional barriers for low-resourced young people attempting to leave the public housing system. Together these findings point to a need for coordination between leaving care supports and social housing services to not only ensure young people have suitable, stable and affordable accommodation after leaving care but are also supported to move on to other types of stable accommodation to reduce chronic reliance on social housing.

Our analysis found higher levels of school instability, lower levels of government school attendance, and higher rates of school suspensions among children and young people who have received child protection services in WA, but to a greater extent for those with care experience. A substantial body of research has identified poor educational outcomes for care-leavers and other young people supported by child welfare services (Berlin et al., 2021; Kääriälä & Hiilamo, 2017; Kim et al., 2019; Montserrat & Casas, 2018; Refaelli & Strahl, 2014), and our findings offer some insight into areas of concern and future opportunities for interventions which may improve educational outcomes for care-experienced children and young people.

One potential explanation for more frequent school moves and decreased attendance rates among the OHC cohort is concurrent moves in housing either before or while in care. Research about care-leavers points to a significant relationship between placement stability and education (Cassarino-Perez et al., 2018), and that educational attainment among care-leavers (including the lower propensity to complete secondary education) has a relationship to the types of care placements young people experience (best outcomes for those in kinship care, followed by foster care, and the poorest outcomes for young people in residential care; Paulsen et al., 2022; Sacker et al., 2021). Coupled with previous research, our results suggest that finding stable, home-based care for children and young people in long-term OHC is likely to substantially impact their education experiences and outcomes. Furthermore, the most considerable discrepancy in attendance rates occurred in Year 9 (third year of secondary school), suggesting support is required before or while entering secondary school, and introducing supports at upper secondary level may be too late to reach those most at risk of dropping out.

Based on police crime reports and correctional data, we found that a greater proportion of children and young people with care experience were processed by police for offences than their peers with and without child protection involvement; that their first offence was at a younger age; and that the types of offences for which they were processed differ compared with the other groups (higher proportion of property and against person offences at first offence). But perhaps the most startling study finding was the highly disproportionate odds of young people with care experience spending time in custody, particularly within the juvenile justice system. Not only have a greater proportion of care-experienced young people spent time in custody as juveniles (either on remand or as a sentenced offender) their stay in custody, particularly when on remand, was longer than the custodial stays of the other two groups. Concerningly, this pattern of greater involvement in the custodial system (and longer periods of incarceration) appears to extend into adulthood for those with care experience.

These findings align with other Australian and international evidence demonstrating a significant relationship between child maltreatment and offending, with maltreatment being a strong predictor of future juvenile justice system involvement even when other factors have been taken into account. For example, Stewart et al. (2002) determined that the more frequent or intense the maltreatment, the more likely children were to offend in the future. Children who are exposed to more frequent or intense maltreatment are also more likely to be placed in OHC; thus, it is unsurprising that the findings show they also have most contact with

police and corrections. Other studies suggest that maltreatment at transition points (i.e., in the transition from early childhood to childhood and from childhood to adolescence) has the most serious impact on future offending (Stewart et al., 2008).

A consistent finding in research is that school failure and dropout, school suspensions, poverty, a lack of connection to the community, and family violence are all associated with adolescent offending (Pyle et al., 2020). Our study shows these are common factors for why young people were placed in OHC and their subsequent experiences while in care. Further relevant to care leavers in WA is evidence that young people with psychosocial disabilities or acquired brain injuries are also at an increased risk of detention during adolescence internationally, and the intersecting overrepresentation of Indigenous children and young people in both the OHC and juvenile justice systems found in countries with colonial histories (Ball & Baidawi, 2021; Borschmann et al., 2020). Locally, there is also evidence for high rates of psychosocial disability among young people in juvenile detention in WA (Bower et al., 2018). Understanding the intersecting vulnerabilities that care-experienced young people face, which are also associated with offending and incarceration, is critical to reducing the unacceptably high propensity for criminal justice involvement among care-experienced young people. Findings from this study suggest that ensuring stable home-based care over the long term can contribute to stability and engagement in education and appropriate specialised support for children and young people with disabilities may be critical to change these outcomes for young people.

Overall, our findings demonstrate care-experienced people in WA face greater health and social adversities than their child protection involved peers, and to a much greater extent, their non-involved peers. While we cannot conclude a causal relationship between OHC experience and these findings, the policies and practices that are idiosyncratic of the Australian child protection system may moderate the trajectory to these outcomes for some people. Australian OHC policy and practice is largely driven by a child-protection approach, with a focus on identifying and managing risk or harm (Lonne et al., 2008), as opposed to a family support approach which is taken in many, mostly European, countries (Myrvang & Bekkstrand, 2023). Once a child is placed in OHC in WA, planning for reunification with the birth family occurs in parallel with planning for long-term OHC (Department of Communities, 2024). Reunification with family is the preferred outcome, but if reunification is deemed not in the best interest of child, children tend to remain in OHC over the long term, rather than exiting through another means, such as adoption. Adoption by non-biological families (local adoptions) as a means of exiting children from OHC is extremely rare in Australia, with only 31 local adoptions occurring nationally in 2022–23 (Australian Institute for Health and Welfare, 2024). Consequently, children and young people tend to spend more time in OHC compared to other countries (O'Donnell et al., 2016), which may be a risk factor for the outcomes identified in this study. Given the potential for long stays in OHC, family-based care is the preferred placement type in Australia, as it is thought that the family environment is best suited to support children's development and needs. As such, Australia has much higher rates of kinship-care and foster-care placements, relative to other countries, and low rates of residential care placements (del Valle & Bravo, 2013), which may act as a protective factor for those placed in OHC in the long term. To further understand the influence of Australia's child protection policies and practices on outcomes for those with care-experience, population-based comparisons to countries with differing approaches to child protection and OHC are needed to elucidate the extent to which Australia's child protection approach and OHC policies act as a protective or risk factor for future adverse outcomes.

While this study provided population-level comparisons across aspects of health, disability, education, social housing and criminal justice involvement for a birth cohort, there are limitations in the breadth of understanding we can elucidate from the data. Concerning both mental health and disability, the available administrative data was limited. Mental health data from community-based, general practice and non-government services were unavailable, so the findings are likely an underestimation. Similarly, at the time this administrative data was made available, this was also the case with disability data, also resulting in a likely underestimation. High school completion rates were not included in the current study, as this data are not held under the authority of the WA Department of Education.

Among the challenges in analysing administrative data is a lack of uniform or standardised operational definitions or categories within data collected for administrative purposes. For example, there are multiple operational definitions of disability in Australia (Mendes & Snow, 2014; Thoresen et al., 2021), reflecting both the multiple purposes (e.g. access to disability support pension, access to the National Disability Insurance Scheme, access to additional learning or school support services) and different reporting and data collection regimes. From a research perspective, these generic challenges created difficulties in comparing outcomes from this study to other administrative jurisdictions. To counteract this challenge, we used broadly accepted categorisations of socioeconomic status, health conditions, disabilities, and offences where possible (e.g., SIEFA, ICD-9, ICD-10, ANZOC).

The study findings point to many further areas of research to better understand why care-experienced young people are at greater odds of interacting with the health, disability, social housing, and criminal justice systems and to find directions for change in policy and service delivery to improve outcomes for young people while in care and after leaving care. Subgroups within the OHC cohort are likely to be at greater odds of adverse outcomes. Identifying and providing appropriate support to the most marginalised young people within an already vulnerable cohort is a priority. Aboriginal children and young people are the most disadvantaged within the Australian population. Given their overrepresentation within child protection systems, establishing how and to what extent Aboriginal children and young people are at an increased risk of the adverse outcomes identified within this study is of critical importance. Findings from such research would provide supporting evidence for developing and implementing culturally informed and safe systems, responses and supports for Aboriginal children and young people and reduce the gap in outcomes for Australia's first nations people. Young people with disabilities are another particularly vulnerable group within the broader care-experienced cohort. Further exploration of the education, housing, criminal justice and health system involvement among this subgroup of young people is warranted to investigate both specific outcomes, as well as factors associated with positive and adverse outcomes so that specialised supports can be developed and implemented. Associations between outcomes and care-related factors such as age of entry into care, duration of time in care, stability of care placements, and types of placements while in care would also be important to explore ensure

policy and practice is guided to meet children and young people's developmental needs at entry and as they develop.

Crucial for further investigation, is the overwhelming odds of care-experienced young people in WA spending time in custody, both on remand and under sentencing. Longitudinal analysis of young people's offending behaviour over time, pre- and post-care offending, movement between OHC placements, custodial stays, and public housing, may assist in identifying critical times for intervention to divert young people from entering the justice system in the first place or from re-entering after a custodial sentence. Interactions between placement stability, education, and criminal justice outcomes are critical for further investigation to explore social risk factors related to justice system involvement and identify other areas for early intervention and support to reduce the likelihood of young people ending up in prison.

Our health data suggests a need for a more in-depth exploration of mental health concerns among young people with care experience in WA and the outcomes for the subgroups of young people who experience mental health problems. Administrative data may be useful to understand how factors related to child maltreatment and care experience (e.g., number and types of placements, age of entering and leaving care) can influence mental health among care-experienced young people, and interactions between mental health and other factors such as gender, or multiple and complex mental health problems (Lehmann et al., 2013; Vinnerljung & Sallnäs, 2008). The very high rates of hospitalisation associated with hyperkinetic disorders and psychosocial disabilities among care-experienced young people compared to those without child protection contact also requires further investigation to disentangle whether behaviours associated with trauma are also a likely explanation for these health system contacts and whether these young people are receiving appropriate supports from elsewhere within the health and education systems.

This study did not differentiate between social housing applications where the young person was the primary applicant or household member on another's (e.g., parent, carer) application or tenancy. A longitudinal exploration of care leaver's access and use of public housing is warranted to understand the long-term needs of housing support across different stages of transition from care to assist in planning and resource provision. The education data also requires further investigation to understand factors contributing to stable and unstable school enrolments for care-experienced young people. Literacy and numeracy outcomes and their relationship with these education experiences would also be an important area for investigation.

Finally, exploring current policies, programs, and individual experiences among care-experienced young people will deepen an understanding of the services and supports available to young people that may address this study's findings, and that young people are accessing and find helpful during transitions from care. Using large datasets to model risk and protective factors associated with outcomes can be useful in guiding decision-making and structural reform at the population level; however, caution is required for guiding decisions at an individual level (Lonne et al., 2022). The complexities of individual situations cannot be accounted for in such models, as the models can only reflect existing aspects of administrative data systems. There is already caution about the use of algorithms as predictive tools in targeting families for child protection because of the limitations and biases of the available data (Keddell, 2019). In practice, individual circumstances must be considered so young people deemed 'low risk' do not miss out on appropriate supports if and when required (Lonne et al., 2022).

#### 4.1. Conclusion

Across the domains of health (physical and mental), disability, education, social housing and criminal justice involvement, we found evidence that care-experienced young people in WA fare significantly worse than their peers. Those who have had child protection involvement but have not been placed in care had better outcomes than those who had been in care. However, their outcomes were still poorer than the cohort with no child protection contact. The individual domains explored demonstrate significantly poorer outcomes in critical areas, which will ripple into long-term effects. There will also be compounded effects, such as significant chronic mental health diagnoses often impacting employment, relationships, and housing, or disengagement from education coupled with disconnection from community can impact offending behaviour and involvement with the criminal justice system. Future research is required to disentangle these outcomes for particular subgroups of care-experienced young people and to identify critical times and associated interventions to prevent trajectories that lead to poor long-term outcomes.

#### CRedit authorship contribution statement

**Lauren Parsons:** Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Reinie Cordier:** Conceptualization, Formal analysis, Funding acquisition, Methodology, Writing – original draft, Writing – review & editing. **Fadzai Chikwava:** Data curation, Formal analysis, Writing – original draft. **Melissa O'Donnell:** Conceptualization, Data curation, Funding acquisition, Methodology, Writing – original draft, Writing – review & editing. **Donna Chung:** Conceptualization, Funding acquisition, Methodology, Project administration, Writing – original draft, Writing – review & editing. **Anna Ferrante:** Conceptualization, Funding acquisition, Methodology, Writing – original draft. **Philip Mendes:** Conceptualization, Funding acquisition, Writing – original draft. **Stian Thoresen:** Conceptualization, Funding acquisition, Methodology, Writing – original draft, Writing – review & editing.

#### Declaration of competing interest

None.

## Data availability

The authors do not have permission to share data.

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