Prenatal Substance Exposure and Child Protection System Involvement to Age 12 Years

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abstract

BACKGROUND AND OBJECTIVES: Children with prenatal substance exposure are at high risk of child protection involvement during infancy. We quantified the risk and timing of child protection system involvement until age 12 years among children with and without prenatal substance exposure.

METHODS: A whole-population birth cohort (2007–2018) was assembled from data linked for the New South Wales Child E-Cohort, Australia. The prenatal substance exposure population included children with records indicating prenatal substance exposure in hospital, emergency, mental health outpatient, opioid treatment, and/or child protection reports data. We estimated the risk of child protection responses (screened-in reports, investigations, substantiations, and out-of-home care [OOHC]), and child maltreatment types.

RESULTS: 1 161 876 children (17 976 with prenatal substance exposure) and 717 063 mothers were included. By age 1 year, 75% of the prenatal substance exposure population born in 2018 had ≥1 screened-in report, 34% ≥1 substantiation, and 20% ≥1 OOHC placement, compared with 4%, 0.8%, and 0.2% of all other children, respectively. By age 12, 90% of the prenatal substance exposure population born in 2007 had ≥1 screened-in report, 61% ≥1 substantiation, and 39% ≥1 OOHC placement, compared with 18%, 5%, and 1% of all other children, respectively. One-half of the prenatal substance exposure population had neglect recorded by age 12. Health and socioeconomic disadvantage were more common among the prenatal substance exposure population.

CONCLUSION: Children with prenatal substance exposure experienced high child protection involvement early in life. Child protection reports represent an opportunity to mobilize nonstigmatizing substance use in pregnancy and antenatal care to prevent escalating child protection interventions.

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Ms Powell conceptualized and designed the study, built the analytic data sets, conducted the data analysis, drafted and revised the manuscript. Dr Falster conceptualized and designed the study, led data acquisition, supervised data analysis, had input into the initial manuscript, and critically reviewed and revised the manuscript for important intellectual content. Dr Havard conceptualized and designed the study, supervised data analysis, had input into the initial manuscript, and critically reviewed and revised the manuscript for important intellectual content. (Continued)

WHAT'S KNOWN ON THIS SUBJECT: Children with prenatal substance exposure had high and early child protection contact during infancy, with 3 in 10 removed into out-of-home care (OOHC) by age 1 year in whole-population birth cohorts in Washington (2006–2013) and California (2006).

WHAT THIS STUDY ADDS: By age 12 years, 9 in 10 children with prenatal substance exposure were screened as at risk by child protection and 4 in 10 children were removed into OOHC in whole-population birth cohorts (2007–2018) followed beyond infancy in an Australian jurisdiction.

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INTRODUCTION

Maternal prenatal substance use is common among children at risk of/experiencing maltreatment.[1,2] The population-level burden of prenatal substance exposure among children reported to child protection agencies is high, ranging from 40% by age 28 days to 53% at 1 year of age.[2] Child protection system responses, such as removal into out-of-home care (OOHC), are also high among children exposed to prenatal substance use, with estimates ranging from 10% to 37% before 5 years of age in Canada, Wales, and the United States.[2–4] To prevent escalating and prolonged child protection system involvement alongside substance use–related harm, it is necessary to understand the flow of whole populations of children with prenatal substance exposure into and through child protection systems during childhood. Every stage of the child protection system's response, from the first-time child protection "screen-in" a report through to removals into OOHC, represents an opportunity to mobilize nonstigmatizing models of health care to support families affected by prenatal substance use.[5]

Two whole-population birth cohort studies in the United States have shown the high risk of reports to child protection agencies and child protection system responses during infancy for children with prenatal substance exposure. In a 2006 Californian birth cohort, 61% of children with prenatal substance exposure were reported by age 1 year and 30% removed into OOHC, compared with 5% and <1% of unexposed children, respectively[4]; and from 2006 to 2013, in Washington birth cohorts, 13% were removed into OOHC by age 28 days.[6] Beyond this, smaller studies of 152 to 1092 participants mostly focused on specific substance exposures, such as cocaine,[7–12] opioids,[7] or methamphetamines,[13] following children to birth or school entry. For example, 39% of children with prenatal cocaine exposure were reported to child protection at birth,[8] and 7% to 11% with methamphetamine exposure were reported by age 6 years.[13] Currently, no population-level study has investigated child protection involvement beyond infancy among children exposed to prenatal substances.

To inform prevention opportunities in contemporary whole populations of children, we quantified the risk of first-time child protection responses (screened-in reports, investigations, substantiations, OOHC) until age 12 years among children born between 2007 and 2018 in New South Wales (NSW), Australia, with and without indicators of prenatal substance exposure.

METHODS

This whole-population cohort study followed RECORD reporting guidelines (Supplemental Table 1).[14]

Data Sources and Linkage

Administrative data were linked by the NSW Centre for Record Linkage[15] for the NSW Child E-Cohort Project, including perinatal data (includes live births ≥20 weeks' gestation or ≥400 g birth weight), birth registrations, hospital inpatient, emergency department, opioid treatment register, mental health outpatients, public housing, and child protection data (Supplemental Figure 1).

Study Population

We defined birth-year cohorts from perinatal and birth registration data including children born in NSW from 2007 to 2018 and their mothers. We defined 2 populations: the *prenatal substance exposure population*, including children with 1 or more records indicating maternal prenatal substance use/exposure (from conception until 27 days after birth) in administrative health and/or child protection report data[16]; and *all other children*. We identified prenatal substance use/exposure using a published method,[17] including alcohol and/or other drug use/exposure or related conditions recorded in the child's and/or the mother's hospital, emergency, mental health outpatient, and opioid treatment register data, and/or concerns of carer substance use reported to the child protection helpline (Supplemental Table 2). Substance use recorded in the tertiary health data likely represents more visible and harmful substance use among mothers, whereas carer substance use reported to child protection by mandatory and nonmandatory reporters captures substance use visible to health and community services that may not be captured in the health data.[17] For example, 80% (9556/13 486) of children with prenatal substance exposure who were reported during the prenatal period were reported by health workers (Table 1).

Child protection records document carer-related concerns; however, the specific carer is not recorded.[18,19] Therefore, we conducted an additional analysis for the more narrowly defined prenatal substance exposure population based on the five health data sources that specifically indicate maternal substance use (Supplemental Analysis 1).

Child Protection Outcomes

We examined the first-time occurrence of 4 child protection outcomes that are responses to child protection reports: screened-in reports, investigations, child protection-defined substantiations, and removals into OOHC (Supplemental Table 3). Child protection services screen reports to determine if concerns meet the threshold for risk of significant harm (henceforth "screened-in reports"). Screened-in reports may be investigated by child protection services, potentially leading to a child protection-defined substantiation of actual/risk of harm (henceforth

TABLE 1. Characteristics and Child Protection Contacts of Children and Mothers in the Prenatal Period/at Birth Among Children in the Prenatal Substance Exposure Population and All Other Children Born in NSW 2007–2018

	Total		All Other Children		Prenatal Substance Exposure Population	
Total children, denominator	1 161 876		1 143 900		17 976	
Pregnancy and birth characteristics						
Number of previous births, n %						
0	500 914	43.1	495 686	43.3	5228	29.1
1	392 061	33.7	388 004	33.9	4057	22.6
2+	267 624	23	258 979	22.6	8645	48.1
Mother smoked during pregnancy, n %	120 129	10.3	106 708	9.3	13 421	74.7
Plurality						
1 child	1 128 156	97.1	1 110 668	97.1	17 488	97.3
≥2 children	33 695	2.9	33 207	2.9	488	2.7
Preterm born <37 weeks' gestation, n %	87 278	7.5	83 769	7.3	3509	19.5
Low birth weight (born <2500 g), n %	73 392	6.3	69 597	6.1	3795	21.1
Small for gestational age, n %	115 994	10.0	111 836	9.8	4158	23.1
Admitted to neonatal ICU or special care nursery (among children born 2008–2015), n %	126 875	14.5	120 890	14.1	5985	42.7
Sociodemographic characteristics at birth for mothers and children						
Female, n %	564 932	48.6	556 163	48.6	8769	48.8
Mothers age at delivery, n %						
<20 y	32 583	2.8	30 554	2.7	2029	11.3
20-<25 y	144 022	12.4	139 838	12.2	4184	23.3
25-<30 y	310 777	26.7	306 167	26.8	4610	25.6
30-<35 y	394 520	34	390 505	34.1	4015	22.3
≥35 y	279 958	24.1	276 820	24.2	3138	17.5
Mother unpartnered at birth, n %	165 582	14.3	154 556	13.5	11 026	61.3
Mother's area of residence, n %						
Lived in major city	897 617	77.3	886 370	77.5	11 247	62.6
Lived in regional/remote/very remote area	242 644	20.9	236 192	20.6	6452	35.9
Area-level disadvantage, n %						
Quintile 1; most disadvantaged	242 996	20.9	236 621	20.7	6375	35.5
Quintile 2	207 627	17.9	203 266	17.8	4361	24.3
Quintile 3	263 847	22.7	259 802	22.7	4045	22.5
Quintile 4	183 636	15.8	181 825	15.9	1811	10.1
Quintile 5; least disadvantaged	263 309	22.7	261 936	22.9	1373	7.6
History of contact with public housing system,	54 997	4.7	47 765	4.2	7232	40.2
Private health insurance/patient, n %	248 776	21.4	248 599	21.7	177	1.0
Mother born in Australia, n %	761 167	65.5	744 780	65.1	16 387	91.2
Aboriginal or Torres Strait Islander child, n %	80 450	6.9	73 584	6.4	6866	38.2
Aboriginal or Torres Strait Islander mother, n %	61 123	5.3	56 001	4.9	5122	28.5
Reports to the child protection helpline during the prenatal period[a,b]						
Children with ≥1 prenatal report to child protection, n %	34 828	3.0	21 342	1.8	13 486	74.0
Children with ≥1 prenatal report related to substance use, n %	12 025	1.0	0	0	12 025	66.9
Children with ≥1 prenatal report related to other concerns, n %	33 565	2.9	21 342	1.8	12 223	68.0

(Continued on next page)

TABLE 1. Characteristics and Child Protection Contacts of Children and Mothers in the Prenatal Period/at Birth Among Children in the Prenatal Substance Exposure Population and All Other Children Born in NSW 2007–2018 (Continued)

	Total		All Other Children		Prenatal Substance Exposure Population	
Reporter types for prenatal reports, n % (denominator: number of children with prenatal reports in each group)						
Health professionals	24 927	71.6	14 177	66.4	9556	79.5
Police	8330	23.9	4714	22.1	3363	28.0
Early education or school teachers	1803	5.2	1225	5.7	534	4.4
Child protection service staff	3688	10.6	1889	8.9	1619	13.5
Non-government organization staff	4283	12.3	2331	10.9	1798	15.0
Other mandatory reporters	3267	9.4	1584	7.4	1580	13.1
Non-mandatory reporters	7524	21.6	3499	16.4	3840	31.9

Abbreviations: ICU, intensive care unit; NSW, New South Wales.
See Supplemental Table 7 for missing data and continuous variable summaries. See Supplemental Table 5 for definitions of the variables and populations in this table.
[a] Denominator includes children born 2008–2015 (N = 776 273) for period this variable was collected.
[b] Prenatal period defined as conception to 27 days after birth.

"substantiation") and potential child removal into OOHC. Child protection services record the issues that were assessed during investigations and then categorize these into 4 maltreatment types: neglect, emotional abuse, physical abuse, and sexual abuse. We examined the first time each maltreatment type was recorded as an assessed issue at the time of a substantiation. Multiple maltreatment types may be assessed at the same or different time points; therefore, the sum of the number of children with each maltreatment type does not equate to the total number with a first-time substantiation. Because carer substance use is classified as neglect, we examined additional assessed issues when children had first-time neglect.

Analysis

We described sociodemographic and health characteristics at birth among the prenatal substance use population and all other children (Supplemental Table 4). In the 2 populations, child protection outcomes were ascertained from conception (date of birth minus gestational age plus 14 days)[16] until the birthday prior to study end (December 2019) (Figure 1). Follow-up ranged from 1 year (first birthday) in the 2018 birth-year cohort to 12 years (twelfth birthday) in the 2007 birth-year cohort. We calculated the child's age at each outcome using birth and contact dates. We created cohort life tables to estimate the incidence proportion (henceforth referred to as "risk") for each outcome by month of age in each birth-year cohort, visually summarized in the figures. The numerator for the incidence proportion was the cumulative number of children with first-time outcomes by monthly age increments, and the denominator was the number of children in each birth-year cohort among the prenatal substance exposure population and all other children. We also quantified the absolute and relative differences in the risk of the outcomes between the populations at yearly age intervals within each birth-year cohort (ie, risk differences and relative risks, respectively). We also examined outcomes in a more narrowly defined prenatal substance exposure population with substance use/exposure recorded only in health data (Subset 1: see Supplemental Figure 3).

We examined the most common maltreatment type combinations in the first year of life among each population, as the first birthday was the common age of follow-up for all birth year cohorts (Subset 2: Supplemental Figure 3). Because maltreatment types are recorded at substantiation, this analysis was restricted to children with a first-time substantiation before their first birthday (the denominator). Among this group, we calculated the number and percentage of children with 1 or more of each of the 4 maltreatment types recorded at 1 or more substantiation before their first birthday (the numerator).

Ethics

This study was approved by the NSW Population and Health Services Research Ethics Committee (2020/ETH01265), the University of NSW HREC (2020/ETH01265), and the Aboriginal Health and Medical Research Council of NSW Ethics Committee (1688/20).

RESULTS

A total of 1 189 996 children had NSW perinatal/birth registration records from 2007 to 2018. After exclusions, 1 161 876 children born to 717 063 mothers over the 12-year period were included (Supplemental Figure 3), with 95 460 to 99 458 per birth-year cohort (Supplemental Table 5). There were 17 976 (1.5%) children in the prenatal substance exposure population, including 4315 (0.4%) with

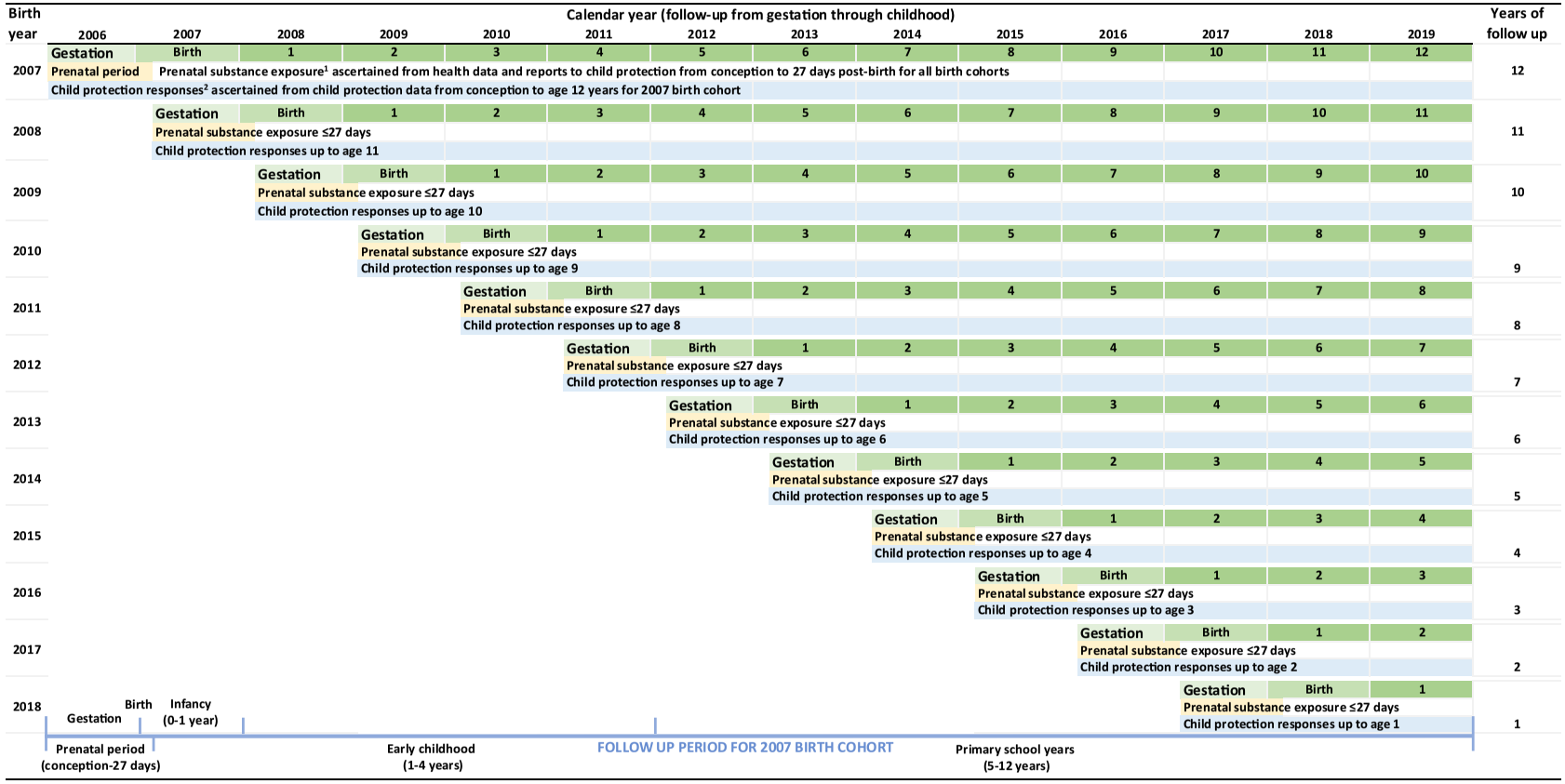

FIGURE 1.

Follow-up periods for the 2007–2018 birth cohorts and ascertainment periods for prenatal substance exposure (used to define the populations) and child protection responses (outcomes).

[a]A record of prenatal substance exposure/use in their mothers' hospital, emergency, mental health outpatient, and/or opioid treatment records, and/or children's hospital or child protection reports data. Prenatal substance exposure includes the maternal use of or child exposure to alcohol and/or any drug use, excluding tobacco, inducing illicit drugs, misuse of prescription drugs, and use of opioid agonist treatment.

[b]Child protection responses included screened-in reports, investigations, substantiations, and removals into out-of-home care.

alcohol exposure and 14 934 (1.3%) with other drug exposure (in Supplemental Table 7), and 1 143 900 children in the "all other" group.

Health, Social, and Child Protection Contacts in the Prenatal Period/at Birth

It was more common for the prenatal substance exposure population to be born to mothers with prior births than all other children (eg, 2+ previous births: 48.1% vs 22.6%), whereas multiple births were similar in both groups (eg, 2.7% vs 2.9%). Adverse perinatal health indicators were more common among the prenatal substance exposure population than in all other children, including maternal smoking in pregnancy (74.7% vs 9.3%), low birthweight (21.1% vs 6.1%), preterm birth (19.5% vs 7.3%), neonatal intensive care admission (42.7% vs 14.1%) (Table 1 and Supplemental Table 5). The percentage of female children was similar in the prenatal substance exposure population (48.6%) and among all other children (48.8%). Socioeconomic disadvantage indicators were more common among the prenatal substance exposure population than among all other children, including being born to young mothers (<20 years: 11.3% vs 2.7%) or unpartnered mothers (61.3 vs 13.5%), living in disadvantaged areas (35.5% vs 20.7%) and regional/remote/very remote areas (35.9% vs 20.6%) and/or public housing (40.2% vs 4.2%). Children in the prenatal substance exposure population were less likely to be private patients (1.0% vs 21.7%) and more likely to have a mother born in Australia (91.2% vs 65.1%) than all other children. Aboriginal children and mothers comprised 38.2% and 28.5% of the prenatal substance exposure population, and 6.4% and 4.9% of all other children, respectively. Seventy-four percent of the prenatal substance exposure population had 1 or more prenatal report to child protection compared with 1.8% of all other children.

Risk of Child Protection Responses

The risk of child protection responses was higher among the prenatal substance exposure population at every age among every birth-year cohort. For brevity, we report examples of the risk estimates among the oldest (2007) and the most contemporary (2018) birth-year cohorts at ages 1 month, 1 year (which are relevant to prevention responses during near universal health contact for pregnancy and birth), and 12 years, the longest follow-up in our study (see Supplemental Tables 8–19 for the tabular summaries of the data visualized in Figures 2-3). We also report examples of the risk differences (RD) and relative risks (RR) between the populations among the most contemporary birth cohort at age 1 year, with RDs and RR at ages 1 month to 12 years for all birth cohorts summarized in the supplementary material (Supplemental Tables 9, 11, 13, and 15).

Screened-in Child Protection Reports

The risk of first-time screened-in reports was higher among the prenatal substance exposure population than among all other children for all birth-year cohorts. The risk of screened-in reports varied across the birth-year cohorts in both populations, decreasing in the 2010 birth cohort in both populations after reporting policy and practice changes were introduced (Figure 2 and Supplemental Table 8).[20] Among the 2007 birth cohort, 74.1% (n = 1461) of the prenatal substance exposure population had 1 or more screened-in report by age 1 month, 81.1% (n = 1599) by age 1 year, and 90.3% (n = 1780) by age 12 years. Comparatively, among all other children born in 2007, 2.0% (n = 1911) had 1 or more screened in report by age 1 month, 5.5% (n = 5183) by 1 year, and 18.2% (n = 17 099) by 12 years. Among the 2018 birth cohort, 68.6% (n = 860) of the prenatal substance exposure population had 1 or more screened-in report by 1 month and 75.3% (n = 944) by 1 year of age, whereas only 1.3% (n = 1233) had 1 or more screened-in report by 1 month and 3.5% (n = 3295) by 1 year among all other children, equating to an RD of 72 percentage points and RR of 22 at age 1 year (Supplemental Table 9).

Child Protection Investigations

The risk of first-time investigations increased in each successive birth-year cohort and was higher in the prenatal substance exposure population than among all other children (Figure 2 and Supplemental Table 10). Among the 2007 birth cohort, 18.0% (n = 354) of the prenatal substance exposure population had 1 or more investigation by age 1 month, 34.7% (n = 684) by age 1 year, and 65.7% (n = 1294) by 12 years. Comparatively, among all other children born in 2007, 0.2% (n = 203) had 1 or more investigation by age 1 month, 0.9% (n = 811) by age 1 year, and 6.2% (n = 5797) by 12 years. Among the 2018 cohort, 47.7% (n = 598) of the prenatal substance exposure population had an investigation by 1 month and 60.1% (n = 754) by 1 year, and among all other children, 0.7% (n = 622) by 1 month and 1.8% (n = 1647) by 1 year, equating to an RD of 58 percentage points and RR of 34 at age 1 year (Supplemental Table 11).

Child Protection Substantiations

The risk of first-time substantiations was higher in the prenatal substance exposure population than among all other children, and increased, among both populations, in the 2007 to 2016 birth-year cohorts, with lower estimates in 2017 and 2018 (Figure 2 and Supplemental Table 12). Among the 2007 birth-year cohort; 17.0% (n = 335) of the prenatal substance exposure population had 1 or more substantiation by age 1 month, 33.1% (n = 653) by age 1 year, and 60.9% (n = 1200) by 12 years. Comparatively, among all other children born in 2007, 0.2% (n = 173)

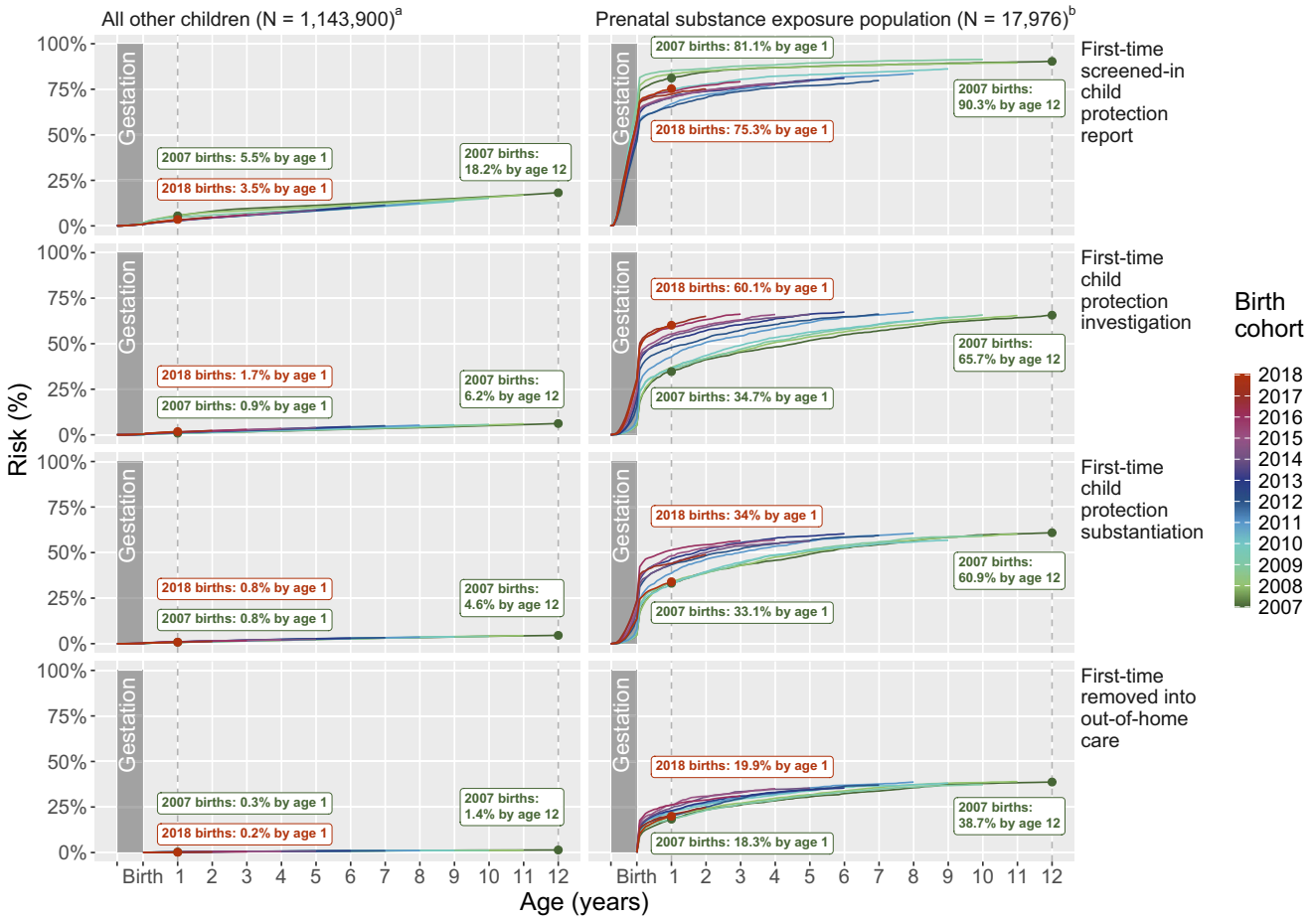

FIGURE 2.
Risk of first-time child protection responses by age 12 among children in the prenatal substance exposure population and all other children born in NSW 2007–2018. Tabular summaries of data presented in Figure 2 are reported in Supplemental Tables 9–16. See Supplemental Table 3 for terms and additional information about child protection outcomes.
[a]Children with no record of prenatal substance exposure/use in available data.
[b]Children with a record of prenatal substance exposure/use in their mothers' hospital, emergency, mental health outpatient, and/or opioid treatment records, and/or children's hospital or child protection reports data. Prenatal substance exposure includes the maternal use of or child exposure to alcohol and/or any drug use, excluding tobacco, inducing illicit drugs, misuse of prescription drugs, and use of opioid agonist treatment.
Abbreviation: NSW, New South Wales.

had 1 or more substantiation by age 1 month, 0.8% (n = 733) by age 1 year, and 4.6% (n = 4288) by 12 years. Among the 2018 cohort, 24.5% (n = 307) of the prenatal substance exposure population had 1 or more substantiation by age 1 month and 34.0% (n = 426) by age 1 year, and among all other children, 0.3% (n = 275) by 1 month and 0.8% (n = 774) by 1 year; equating to an RD of 33 percentage points and RR of 41 at age 1 year (Supplemental Table 13).

OOHC

The risk of first-time OOHC placements was higher in the prenatal substance exposure population than among all other children and increased in the 2007 to 2016 birth-year cohorts, followed by lower estimates in 2017 and 2018 (similar to 2012) (Figure 2 and Supplemental Table 14). Among the 2007 birth cohort; 9.0% (n = 177) of the prenatal substance exposure population had 1 or more OOHC placement by age 1 month, 18.3% (n = 361) by age 1 year, and 38.7% (n = 763) by 12 years. Comparatively, among all other children born in 2007, less than 0.1% (n = 70) had 1 or more OOHC placement by age 1 month, 0.3% (n = 260) by age 1 year, and 1.4% (n = 1324) by 12 years. Among the 2018 cohort, 10.3% (n = 129) of the prenatal substance exposure population had 1 or more removal into OOHC by age 1 month and 19.9% (n = 250) by 1 year, and among all other children, less than 0.1% (n = 54) by 1 month and 0.2% (n = 162) by 1 year, equating to an RD of 20 percentage points and RR of 117 at age 1 year (Supplemental Table 15).

There was a similar pattern of high and early life child protection responses among the prenatal substance

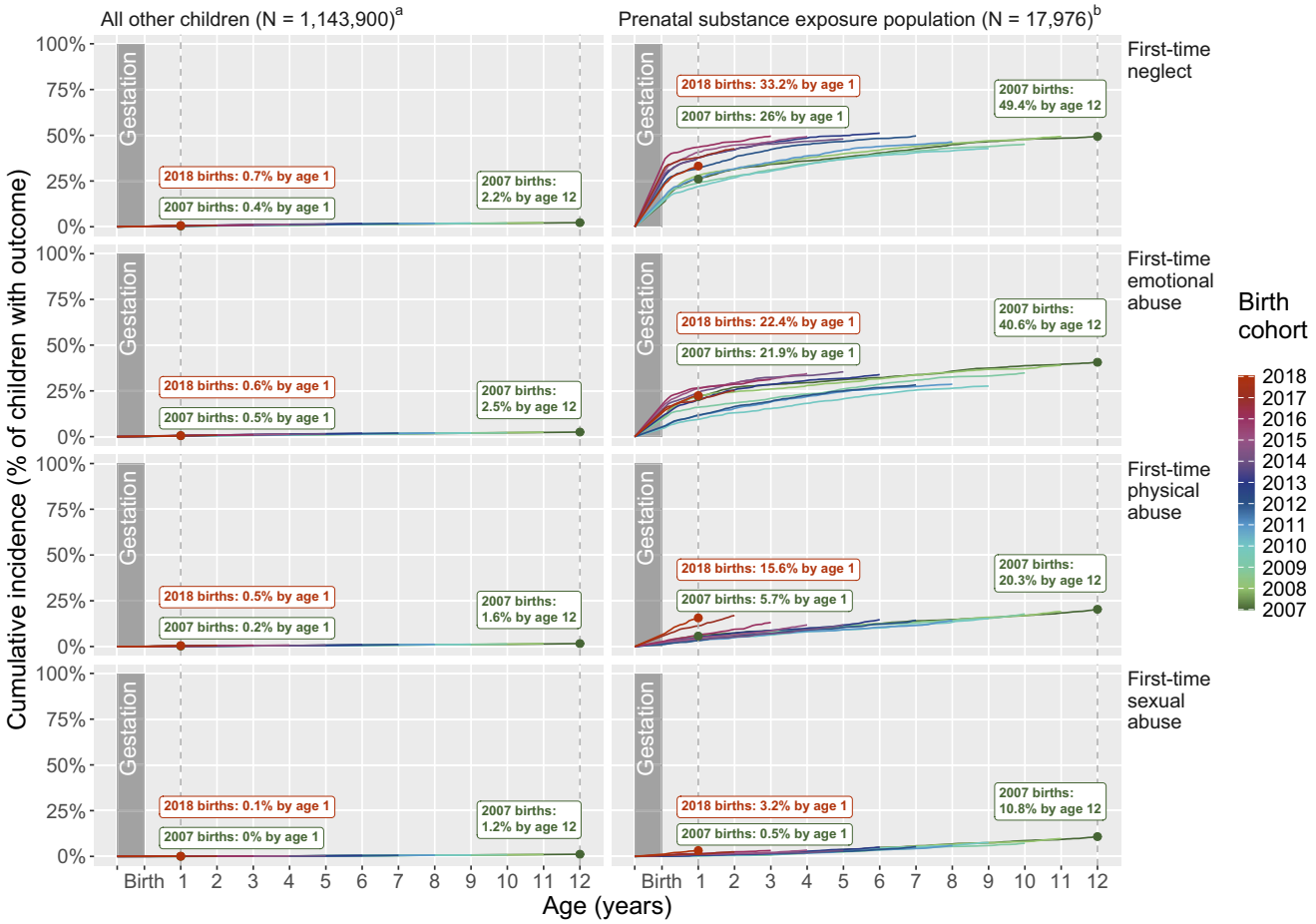

FIGURE 3.

Risk of the first-time each maltreatment type was recorded as an assessed issue at the time of a substantiation, among children in the prenatal substance exposure population[1] and all other children[2] born in NSW 2007–2018. Tabular summaries of data presented in Figure 3 are reported in Supplemental Tables 17–20. See Supplemental Table 3 for terms and additional information about child protection outcomes. Children may have multiple maltreatment types recorded on ≥1 substantiation records over time. Therefore, the total number of children with each first-time maltreatment types (in Figure 3) does not add up to the number with first-time substantiations (for any maltreatment type/s) in Figure 2. The risk of substantiations, and thus all maltreatment types, was lower in the 2017 and 2018 cohorts after data/counting rule changes were introduced in 2016.

[a]Children with no record of prenatal substance exposure/use in available data.

[b]Children with a record of prenatal substance exposure/use in their mothers' hospital, emergency, mental health outpatient, and/or opioid treatment records, and/or children's hospital or child protection reports data. Prenatal substance exposure includes the maternal use of or child exposure to alcohol and/or any drug use, excluding tobacco, inducing illicit drugs, misuse of prescription drugs, and use of opioid agonist treatment.

Abbreviation: NSW, New South Wales.

exposure population defined using health data only (n = 10 645; Supplemental Analysis 1).

Child Maltreatment Types

The risk of first-time neglect, and emotional, physical, and sexual abuse was higher, from birth to 12 years, among the prenatal substance exposure population than among all other children, within all birth-year cohorts (Figure 3 and Supplemental Tables 16–19). Among the prenatal substance exposure population, the risk of neglect and emotional abuse was higher than physical and sexual abuse in all birth-year cohorts from birth to 12 years. For example, among the 2007 prenatal substance exposure cohort, by age 12 years, 49.4% (n = 973) had neglect, 40.6% (n = 801) emotional abuse, 20.4% (n = 401) physical, and 10.8% (n = 213) sexual abuse assessed. Among all other children, 2.2% (n = 2107) had neglect, 2.5% (n = 2359) emotional, 1.6% (n = 1525) physical, and 1.2% (n = 1113) sexual abuse assessed by age 12 years. Among the 2018 prenatal substance exposure cohort, by age 1 year, 33.2% had neglect, 22.4% emotional, 15.6% physical, and 3.2% sexual abuse, and among all other children, 0.7% had neglect, 0.6% emotional, 0.5% physical, and 0.1% sexual abuse assessed.

Among children in the prenatal substance exposure population with first-time neglect, 50.2% had 1 or more additional issue classified as "neglect" (other than carer

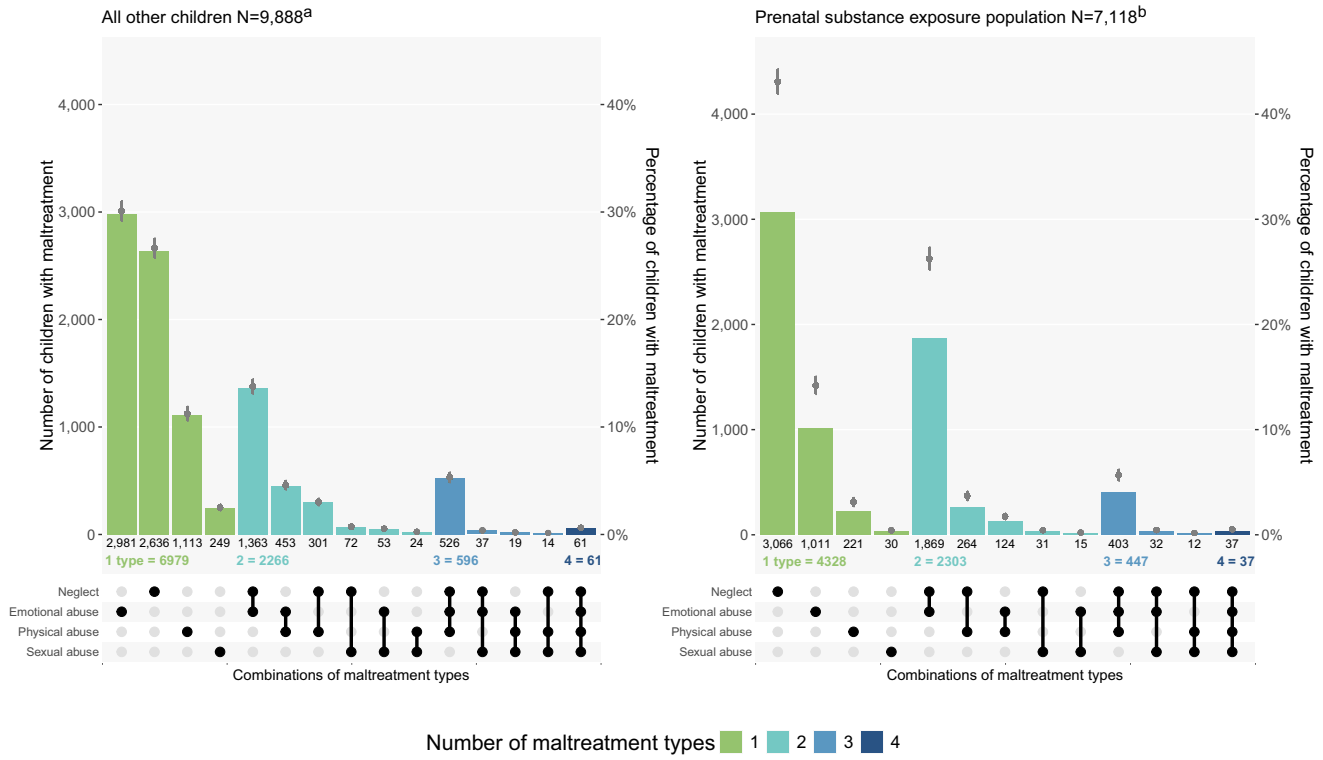

FIGURE 4.

Number (bars) and percentage (circles with error bars) of children with different combinations of maltreatment types assessed at ≥1 substantiations by age 1 year, among children with a first-time substantiation before their first birthday, in the prenatal substance exposure population and all other children born in NSW 2007–2018. Tabular summaries of data presented in Figure 4 are reported in Supplemental Table 21. Child maltreatment types are defined as those recorded in primary and other issue fields recorded at the time of a child protection defined substantiation.

[a]Children with prenatal substance exposure who had a child protection defined substantiation by age 1 year. Children with prenatal substance exposure/use included those with a record of prenatal substance use in their mothers' hospital, emergency, mental health outpatient, and/or opioid treatment records, and/or children's hospital or child protection reports data. Prenatal substance use includes the use of alcohol and or any drug use, excluding tobacco, inducing illicit drugs, misuse of prescription drugs, and use of opioid agonist treatment.

[b]All other NSW children who had a child protection defined substantiation by age 1 year. All other children included those with no record of prenatal substance use in the available data.

Abbreviation: NSW, New South Wales.

substance use) and 69% had additional issues related to physical, emotional and/or sexual abuse assessed (Table 1 and Supplemental Table 20).

Combinations of Maltreatment Types by Age 1 Year

Among all children born in the 2007 to 2018 birth-year cohorts that had 1 or more maltreatment type assessed at the time of a first-time substantiation by age 1 year, we report the most common maltreatment type combinations by population. Most children had only 1 maltreatment type assessed (prenatal substance exposure population: 4328/7118 [60.8%]; all other children: 6979/9888 [70.6%]) (Figure 4 and Supplemental Table 21). Among the prenatal substance exposure population, the most common combinations of maltreatment types were neglect alone (43.1%, n = 3066), neglect and emotional abuse (26.3%, n = 1869), and emotional abuse alone (14.2%, n = 1011). The most common combinations among all other children were emotional abuse alone (30.1%, n = 2981), neglect alone (26.6%, n = 2636), emotional abuse and neglect (13.8%, n = 1363), and physical abuse alone (11.2%, n = 1113).

DISCUSSION

We found a high risk of child protection involvement from gestation to age 12 years among children with recorded prenatal substance exposure in this study of over 1.1 million Australian children born between 2007 and 2018. In the most contemporary 2018 birth-year cohort, 7 in 10 children with prenatal substance exposure were screened in at risk of harm by age 1 month, compared with 1 in 100 children without prenatal substance exposure. This translated into a higher risk of more serious child protection responses during infancy. For example, 1 in 3 children with prenatal substance exposure had a substantiation by age 1 year, and 1 in 5 children were removed into OOHC,

compared with fewer than 1 in 100 children without prenatal substance exposure for both outcomes among the 2018 birth-year cohort. In the 2007 birth-year cohort with 12-year follow-up, 9 in 10 children with prenatal substance exposure were screened in at risk of significant harm by child protection, 3 in 5 children had a substantiation, and 2 in 5 children were removed into OOHC by age 12 years. In the same birth-year cohort, 1 in 5 children without prenatal substance exposure were screened in, 1 in 20 had a substantiation, and 1 in 100 were removed by age 12.

The high risk of child protection involvement during infancy for children with prenatal substance exposure is consistent with research from the United States despite jurisdictional differences in health and child protection systems.[4,6,21] For example, in the first month of life, 13% of children with prenatal substance exposure were removed into OOHC in the 2006 to 2013 birth-year cohorts in Washington[6] and 9% to 18% among the 2007 to 2018 birth-year cohorts in our study. By age 1 year, 45% of children with prenatal substance exposure had a substantiation and 29% were removed in the 2006 Californian birth-year cohort,[4] compared with 33% to 51% and 18% to 26%, respectively, across our 2007 to 2018 birth-year cohorts. Escalating child protection responses to children with prenatal substance exposure in early life highlight the critical need for nonstigmatising models of antenatal and postnatal health care integrated with substance use in pregnancy services, parenting support, and other social services to prevent substance use–related harms and prolonged child protection intervention.

Our finding that neglect was the most common maltreatment type assessed at the time of a substantiation, from gestation to age 12 years, among children with prenatal substance exposure is consistent with 2 previous whole-population studies. In a US study, neglect was the most common maltreatment type recorded in Medicaid inpatient and outpatient data by age 1 year among children with prenatal substance exposure born between 2006 and 2010 in North Carolina, Georgia, and Texas.[22] In a Western Australian study, one-half of children born between 1983 and 2007 with maternal alcohol use had neglect recorded in child protection data.[23] In our study, neglect may be common among children with prenatal substance exposure because carer substance use is classified as neglect by child protection in NSW. However, when children were assessed as having neglect in our study, it was not just related to carer substance use. For example, among the prenatal substance exposure population with neglect, almost one-half of the children had an additional non–substance use related subtype, such as housing concerns, recorded. We also show a higher burden of disadvantage, such as single motherhood and public housing need, recorded for the prenatal substance exposure population in the other linked data sources. The co-occurrence of prenatal substance exposure and disadvantage reinforce the importance of supportive social services to address socioeconomic disadvantage alongside health system supports for substance use during and beyond pregnancy.

The overrepresentation of Aboriginal children in the prenatal substance exposure population relative to the NSW birth population in the same period (38% vs 7%) reflects the transgenerational impacts of colonization" on the health and well-being of Australia's First People.[24] Substance use is one response to intergenerational trauma and to the systemic racism that has underpinned historical policies of child removal[24] and ongoing structural maintenance of poverty, health, and social disadvantage.[25,26] These structural and system circumstances have placed First Nations Australians at increased risk of substance use conditions over generations. Historic and present-day investment in crisis-focused systems perpetuates oversurveillance, reporting, and escalation of child protection interventions for Aboriginal families, contributing to overrepresentation in the child protection system.[25,27,28] For these reasons, investment in Aboriginal community-controlled and culturally appropriate mainstream health service responses are critical to prevent both substance use–related harms for mothers and babies and the escalating child protection responses for families affected by prenatal substance use.[26,29] Supportive response to the co-occurring circumstances of poverty and disadvantage, alongside substance use, will require services that lie outside statutory child protection systems.[5,30,31]

Child and family-centered policies, screening practices, and models of care designed to support the health and social needs of families affected by prenatal substance use, from the first report to child protection, are needed to prevent escalating child protection involvement, preserve family connections, and promote positive child outcomes.[5] The risk of child protection involvement may be a barrier for families to engage in antenatal care, substance use treatment, and family support services.[32–34] There is growing advocacy for a shift from risk-oriented child "protection" systems to a child and family well-being system that will necessitate the redesign of reporting, screening, and investigation practices and community-led, culturally appropriate supportive responses to prenatal substance use, alongside health and social needs.[35–38]

Strengths and Limitations

Our study of 1.2 million children and 12-year follow-up represents the largest and longest study quantifying child protection contacts among prenatal substance–exposed populations. Our prenatal substance exposure population likely represents mothers with more harmful substance use, as we used substance use indicators available in tertiary health care and child protection report data.

Given that there is a spectrum of substance use observed, disclosed, or undisclosed in varied settings,[2] the size of the prenatal substance exposure population ascertained from these administrative data is likely a lower-bound estimate of the population that may benefit from services and supports.

We were unable to explore child protection outcomes for children that moved out of NSW during follow-up, which makes this a lower bound estimate of the risk of child protection involvement for the prenatal substance–exposed population. Beyond actual changes in child safety/risk, changes in child protection policy, practice, data collection, and reporting likely impacted outcome measurement across the 12 birth-year cohorts. Because child protection report data records "carer substance use," it is possible that some children in the prenatal substance exposure population were reported due to substance use by a carer other than the mother. However, when we used the definition of substance use recorded only in health records, we found a comparable pattern of high and early child protection responses.

CONCLUSION

Children with prenatal substance exposure indicators in tertiary health care and child protection reports are at high risk of child protection involvement, with 9 in 10 screened at risk of harm, and 2 in 5 removed into out-of-home care by age 12 years. Most of these children are screened-in at risk by child protection by 1 month of age, representing an opportunity to mobilize early culturally appropriate, nonstigmatizing models of antenatal/postnatal and substance use health care for mothers and babies to prevent escalating child protection involvement, preserve family connections, and promote child health and development.

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ETHICAL APPROVAL

This study was approved by the NSW Population and Health Services Research Ethics Committee (2020/ETH01265), the University of NSW HREC (2020/ETH01265), the Aboriginal Health and Medical Research Council (AH&MRC) of NSW Ethics Committee (1688/20), the NSW Corrective Services Ethics Committee (D20/0886760). The CHeReL operate under strict data security protocols and implement high-level physical security measures. Their security protocols are in accordance with the Australian Government Protective Security Policy Framework, the Population Health Research Network Information Governance Framework, and the NHMRC Code for Responsible Conduct of Research.

ABBREVIATIONS

OOHC: out-of-home care
NAS: Neonatal Abstinence Syndrome
RECORD: REporting of studies Conducted using Observational Routinely collected Data
NSW: New South Wales

Dr Pilkington contributed to the design of the study, supervised data analysis and interpretation of the results, and critically reviewed and revised the manuscript for important intellectual content. Ms Ahmed and Dr Hanly supervised and assisted with the build of the analytic datasets, contributed coding and statistical expertise to the analysis, interpretation and reporting of results, and critically reviewed and revised the manuscript for important intellectual content. Dr Dobbins contributed to the design of the study, supervised data analysis and interpretation of the results, and critically reviewed the manuscript for important intellectual content. Dr Lynch contributed epidemiological and content expertise to the interpretation and reporting of results and critically reviewed and revised the manuscript for important intellectual content. Dr Newton contributed content expertise to the interpretation and reporting of results and critically reviewed and revised the manuscript for important intellectual content. Drs Cretikos and Williamson contributed epidemiological and policy expertise to the interpretation and reporting of results and critically reviewed and revised the manuscript for important intellectual content. Dr Stewart and Merran Butler contributed policy expertise to the interpretation and reporting of results, and critically reviewed and revised the manuscript for important intellectual content. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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