

BMJ Open Examining the intersection of child protection and public housing: development, health and justice outcomes using linked administrative data

Catia Malvaso ^{1,2}, Alicia Montgomerie,¹ Rhiannon Megan Pilkington,¹ Emma Baker,³ John W Lynch^{1,4}

To cite: Malvaso C, Montgomerie A, Pilkington RM, *et al*. Examining the intersection of child protection and public housing: development, health and justice outcomes using linked administrative data. *BMJ Open* 2022;**12**:e057284. doi:10.1136/bmjopen-2021-057284

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2021-057284>).

Received 10 September 2021
Accepted 24 May 2022



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

Correspondence to

Dr Catia Malvaso;
catia.malvaso@adelaide.edu.au

ABSTRACT

Objective We described development, health and justice system outcomes for children in contact with child protection and public housing.

Design Descriptive analysis of outcomes for children known to child protection who also had contact with public housing drawn from the South Australian (SA) Better Evidence Better Outcomes Linked Data (BEBOLD) platform.

Setting The BEBOLD platform holds linked administrative records collected by government agencies for whole-population successive birth cohorts in SA beginning in 1999.

Participants This study included data from birth registrations, perinatal, child protection, public housing, hospital, emergency department, early education and youth justice for all SA children born 1999–2013 and followed until 2016. The base population notified at least once to child protection was n=67 454.

Primary outcome measure Contact with the public housing system.

Secondary outcome measures Hospitalisations and emergency department presentations before age 5, and early education at age 5, and youth justice contact before age 17.

Results More than 60% of children with at least one notification to child protection had contact with public housing, and 60.2% of those known to both systems were known to housing first. Children known to both systems experienced more emergency department and hospitalisation contacts, greater developmental vulnerability and were about six times more likely to have youth justice system contact.

Conclusions There is substantial overlap between involvement with child protection and public housing in SA. Those children are more likely to face a life trajectory characterised by greater contact with the health system, greater early life developmental vulnerability and greater contact with the criminal justice system. Ensuring the highest quality of supportive early life infrastructure for families in public housing may contribute to prevention of contact with child protection and better life trajectories for children.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This descriptive study provides epidemiological insight into the largely unexplored intersection between child protection and housing systems using whole-of-population linked administrative data.
- ⇒ The findings of this study are based on data drawn from South Australia and may not be directly generalisable to other locations because of different administrative systems.
- ⇒ Despite data being drawn from one Australian jurisdiction, the qualitative relationship between child protection and housing is likely to be similar.

INTRODUCTION

Child maltreatment is a worldwide problem and poor outcomes among maltreated children have been well documented.¹ Contact with child protection systems is common. In South Australia (SA), one in three children was reported to child protection by age 18 and, of those reported, 38% were first reported by age 5.^{2,3} This cumulative incidence is approximately twice that of asthma.⁴ In Australia, the number of notifications to child protection that were screened-in for review has reached unprecedented levels, with more than 450 000 notifications in 2018–2019.⁵ The scale of the child protection problem is consistent with data across Australian jurisdictions,^{6,7} New Zealand,⁸ California⁹ and the UK.^{10,11} Extensive reforms within statutory child protection have been recommended by numerous inquiries.^{12–15} A consistent theme is the call for a public health approach to reduce child protection contact through greater integration of preventive efforts across multiple government agencies. However, the design of siloed ‘incident-based’ information systems (ie, agencies counting episodes of contact)

does not support integration because different agencies may not be able to view their 'common clients'.³

Secure, safe and affordable housing is a basic social determinant of health and is crucial as a stable base for child health and development. Inadequate housing has been suggested as an underlying reason for child protection contact because it reflects resource constraints that limit family capacity to provide adequate care.^{16–18} It is recognised that any association between housing and child protection may vary depending on the type of housing, its quality, location and the community within which different types of housing are situated. It is probable that contact with public housing and child protection systems may be the result of the same underlying conditions (eg, poverty). However, the connection between child protection and housing system contact has been largely unexplored.¹⁹ We do not know how many children in contact with child protection are also in contact with public housing. Under calls for greater integration across agencies, it is unclear what role the housing system might play in child maltreatment prevention.

This study describes the intersection between the child protection and public housing systems, and subsequent health, developmental and justice system outcomes. The analysis is deliberately descriptive to explore the role of agencies outside of statutory child protection.²⁰ First, we documented the number of children in contact with child protection who also had contact with public housing. Second, we identified the proportion of children for whom housing contact preceded child protection notification. Third, we examined perinatal characteristics, emergency department (ED) presentations, hospitalisations, early developmental vulnerability and youth justice system contact for children known to both child protection and housing systems.

METHOD

Data source

The Better Evidence Better Outcomes Linked Data (BEBOLD) platform is a comprehensive linked data platform able to track children's well-being from before birth into early adulthood. It contains deidentified whole-of-population linked administrative data on all SA children born from 1999 onwards. Data were probabilistically linked by an independent linkage agency using demographic characteristics. Australian data linkage systems typically estimate a false linkage rate of 0.1%–0.5%.^{21 22}

Child protection

Information on children who had contact with child protection was obtained from the SA Department for Children Protection (DCP). Children were considered to be in contact with the child protection if they were the subject of at least one report by age 16. In SA, any individual can make a report (known in SA as a notification) to DCP if they suspect on reasonable grounds that a child is, or may be, at risk of child abuse, neglect or harm.

Notifications are thus the 'front-end' of the child protection system. Notifications are then assessed to determine whether they should be screened-in, and then potentially enter an investigation phase. SA operates under legislation of mandatory reporting for any volunteer or professional who works with children to notify concerns. The base population for this analysis were children notified at least once to child protection was $n=67\,454$.

Public housing system

Information on all children known to the jurisdictional government-funded housing system was obtained from the SA Housing Authority. This Authority collects data on people who have received or applied for government managed housing services and short-term private rental assistance schemes. It does not include schemes funded by the federal government or delivered by non-government agencies. In this study, children were considered to be known to the housing system if they were recorded as living in households who had received at least one of three different types of housing assistance, including (1) lived in a household receiving short-term private rental assistance; (2) listed as part of a household on a waitlist for public housing; and/or (3) had lived in public housing. These services are offered on a means-tested basis, and because household social and financial circumstances can change, it is possible that a child may have experienced all three types of public housing assistance over time.

Short-term private rental assistance provides financial assistance to help secure or maintain a tenancy in the private market, such as bond guarantees, cash bonds, up to 2 weeks' rent in advance, rent in arrears (for existing tenancies) and financial assistance for up to three nights' emergency accommodation. Families who are unable to access suitable housing and who meet income and asset eligibility criteria can apply to live in public housing. They may be placed on a public housing waitlist if they are awaiting approval of an application, awaiting housing becoming available or awaiting transfer to another property.

Perinatal characteristics

Perinatal characteristics and demographic information was sourced from the SA Perinatal Statistics Collection. Perinatal data were supplemented and validated by Births Registrations data, which included parental and child demographic information as well as basic clinical birth data. Pregnancy and birth outcome information included maternal smoking in the second half of pregnancy (yes/no), low birth weight (<2500 g/ ≥ 2500 g), preterm gestational age (<37 weeks/ ≥ 37 weeks), number of previous births, insufficient antenatal care defined as <7 visits (yes/no), and a postnatal health check at approximately 1–4 weeks that is universally available (yes/no). Sociodemographic variables included maternal age, maternal marital status (partner/no partner) and parental labour force status (in labour force/not in labour force). Postcode

was used to derive a neighbourhood level indicator of sociodemographic disadvantage (Index of Relative Socioeconomic Advantage and Disadvantage; IRSAD)²³ that included neighbourhood aggregate information on income, education, employment, housing, car ownership, lone parenthood, English proficiency and disability.

Health, education and justice system outcomes

Contact with adjacent agencies included emergency department (ED) presentation before age 5 (yes/no); inpatient public hospital visit (yes/no) before age 5; developmental vulnerability at age 5 on one or more domains (yes/no) and identified as special needs (yes/no) using the Australian Early Development Census (AEDC)²⁴; and any contact with the youth justice system (yes/no) and admission into custody (yes/no) before age 17.

Statistical analyses

Data are presented for all SA children born from 1999 to 2013 for whom child protection and housing data were available. In stage 1 of the analysis, we calculated the proportion of children who had at least one notification to child protection and contact with public housing. The follow-up time from birth to contact with child protection and/or housing was not the same for all children because a child born in 1999 would have had ~16 years to have contact with these systems, whereas a child born in 2013 would have only had ~2 years. In stage 2, we calculated the proportion of children who had contact with the child protection and/or the housing system before age five for children born 1999–2010 to ensure that all children had the same follow-up time. In stage 3, we compared sociodemographic and characteristics at birth for children who had contact with the child protection system, ED presentation and inpatient hospital visits before age 5, early development at age 5, and contact with the youth justice system before age 17 (for the 1999 birth cohort only to ensure follow-up to age 17), according to types of housing system contact. For these comparisons, mutually exclusive categories of housing system contact were created to broadly reflect levels of need: (1) no contact with the housing system; (2) children in households which had received short-term private rental assistance but who had never been on a public housing waitlist or had lived in public housing; (3) children in households who had been on a public housing waitlist or who had been in households receiving short-term private rental assistance but had never lived in public housing; and (4) children who had ever lived in public housing before age 5. Analyses were conducted in Stata SE V.15.²⁵

Patient and public involvement

No patient involved.

RESULTS

Of the children born 1999–2013 who had been notified to child protection at least once ($n=67\,454$), over half

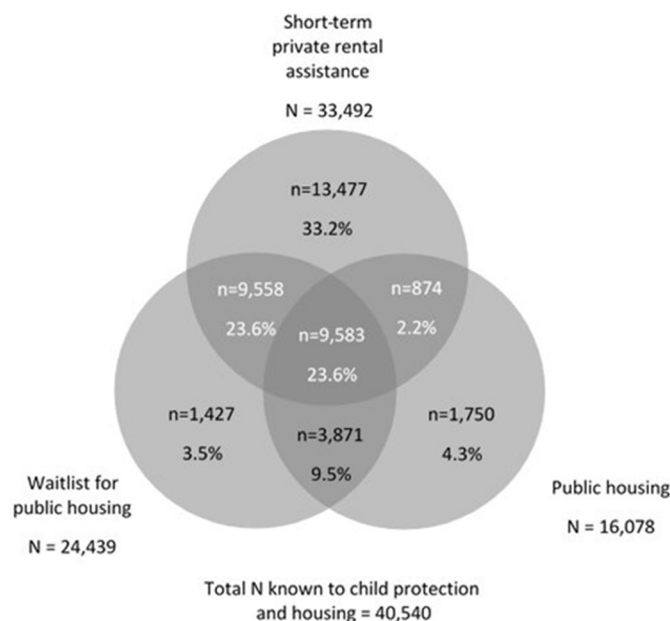


Figure 1 Children born 1999–2013 with at least one child protection notification and different types of housing system contact experienced.

($n=40\,540$; 60.1%) also had contact with public housing. Figure 1 provides a breakdown of public housing contact among children with at least one notification to child protection. The largest proportion ($n=33\,492$; 82.6%) were in a households provided with short-term private rental assistance, followed by those who were ever on a public housing waitlist ($n=24\,439$; 60.3%). A relatively smaller proportion ($n=16\,078$; 39.7%) had ever lived in public housing. However, it was common for children to have experienced combinations of types of housing assistance. As can be seen by the number in the centre of the Venn diagram, just under a quarter of children ($n=9\,583$; 23.6%) had experienced all three types of housing assistance.

Table 1 shows the number of children with child protection and the housing system contact before age 5 and includes children born from 1999 to 2010 to ensure equal follow-up. Before age 5, 61.0% of children who were notified at least once to child protection were known to the housing system. Table 1 shows the proportion of children who had contact with housing prior to having contact with child protection before age five. Of those in contact with both systems, the majority (60.2%) were in contact with housing before child protection. This was true for all types of housing system contact. Of the 35 144 children in contact with the child protection system before age 5, 12 924 (36.8%) were in contact with housing before child protection contact occurred.

Table 2 shows characteristics measured at birth and outcomes for children born 1999–2010 who had at least one notification to child protection before age 5 by the type of housing assistance provided. Compared with children with no housing contact, there is a clear pattern of greater social and economic disadvantage for children

Table 1 Timing of child protection and housing system contact before age 5 for children born 1999–2010

	Any housing system contact			Different types of housing system contact								
				Short-term private rental assistance only*			Listed on a public housing waitlist†			Ever in public housing‡		
	n	As % of (A)	As % of (B)	n	As % of (A)	As % of (B)	n	As % of (A)	As % of (B)	N	As % of (A)	As % of (B)
Notified to child protection (A)	35 144											
Known to housing and child protection (B)	21 477	61.0		6079	17.3		6241	17.8		9157	26.1	
Known to housing before child protection	12 924	36.8	60.2	3299	9.4	54.3	3881	11.0	62.2	5744	16.3	62.7
Known to housing and child protection at the same time	73	0.2	0.3	22	0.1	0.4	22	0.1	0.4	29	0.1	0.3
Known to housing after child protection	8490	24.1	39.5	2758	7.8	45.4	2338	6.7	37.5	3384	9.6	37.0

*Excludes children who have been in, or on a waitlist for, public housing.

†Includes children who have been in families receiving short-term private rental assistance but excludes children who have been in public housing.

‡Includes all children who have ever been in public housing.

with the double burden of child protection and public housing contact. Patterns of disadvantage appeared to be greater for children across the different types of housing system support provided, which was meant to broadly reflect levels of housing need. For example, compared with children notified to child protection but who had no contact with housing, a higher proportion of children who were notified and who also lived in public housing before age 5 were as follows: born to mothers without a partner (20.4% vs 46.5%); part of jobless families (11.8% vs 37.4%); and living in the most disadvantaged areas (33.9% vs 57.0%). We examined whether children known to both systems had received a postnatal health check that is universally available. Although over half (55.2%) of children known to child protection but who did not have housing system contact did not receive a health check, the proportion was even higher (60%–69%) among those who also had contact with the housing system.

Being admitted to hospital and ED presentations was common for all groups. For hospital admissions, this ranged from 44.3% for children known to child protection who had also been listed on a public housing waitlist, to 50.6% for those who ever lived in public housing. For ED presentations, this ranged from 38.6% for children known to child protection who had ever lived in public

housing to 47.1% for those who had lived in a household receiving short-term private rental assistance.

The proportion of children identified as developmentally vulnerable on one or more domains at age 5 differed depending on the type of housing assistance provided. Compared with children notified to child protection but who had no contact with housing, a higher proportion of children who were notified and who ever lived in public housing were developmentally vulnerable (37.4% vs 56.5%) and a higher proportion were identified as having special needs (10.2% vs 14.0%).

For the 1999 birth cohort, contact with the youth justice system before age 17 also differed across the different types of housing assistance, with 10% of children who were notified and who lived in public housing before age five experiencing youth justice supervision and 7% entering custody by age 17 (compared with 1.6% and 1.3% who had only been notified). See online supplemental material for subsequent birth cohorts.

DISCUSSION

There is substantial overlap between children known to the child protection and public housing systems in SA. Over half of the children born 1999–2013 who were

Table 2 Characteristics at birth of children with at least one notification to child protection before age 5 with different types of housing system contact, born from 1999 to 2010

	No housing contact (n=13 667)		Short-term private rental assistance only* (n=6079)		Listed on a public housing waitlist† (n=6241)		Ever in public housing‡ (n=9157)	
	n	% col	n	% col	n	% col	n	% col
Maternal age								
<19	677	6.7	1064	19.9	1310	24.6	1718	20.0
20–24	2053	20.4	1880	35.2	1724	32.4	2577	30.0
25–29	2772	27.6	1283	24.0	1189	22.3	2075	24.2
30–34	2616	26.0	744	13.9	704	13.2	1378	16.1
35–39	1485	14.8	305	5.7	319	6.0	688	8.0
40+	452	4.5	72	1.3	81	1.5	147	1.7
Baby Aboriginal or Torres Strait Islander	632	6.3	370	6.9	695	13.0	2541	29.6
Mother's marital status—no partner	2046	20.4	1769	33.1	2191	41.1	3987	46.5
Mother not in labour force	4899	48.9	3397	63.7	4027	76.0	7276	85.3
Father not in labour force	1556	16.2	1173	23.5	1816	37.5	3941	52.1
Jobless family	1191	11.8	1132	21.2	1623	30.5	3204	37.4
Lived in the most disadvantaged SEIFA quintile	3391	33.9	2291	42.9	2445	45.9	4888	57.0
Mother smoking in pregnancy	3126	31.6	2328	44.1	2758	52.6	5346	63.6
Low birth weight (<2500 g)	896	8.9	492	9.2	570	10.7	1135	13.2
Preterm birth	1036	10.3	550	10.3	625	11.8	1187	13.9
Mother number of previous births								
None	3685	36.7	2255	42.3	2116	39.8	2437	28.5
1	3108	31.0	1555	29.1	1476	27.7	2128	24.9
2	1761	17.6	891	16.7	883	16.6	1600	18.7
3	863	8.6	391	7.3	459	8.6	1,1011	11.8
4+	615	6.1	245	4.6	385	7.3	1387	16.2
Insufficient antenatal care (<7 visits)	1264	13.8	811	16.3	1063	21.8	2290	29.5
1 to 4 week health check	7717	56.5	4175	68.7	3750	60.1	5768	63.0
Hospital inpatient before age 5	4961	36.3	2801	46.1	2765	44.3	4635	50.6
Emergency department presentation before age 5	4742	34.7	2862	47.1	2539	40.7	3532	38.6
Developmentally vulnerable at age 5	1035	37.4	667	43.3	561	46.8	1019	56.5
Identified as special needs at age 5	319	10.2	157	9.1	154	11.2	301	14.0
Any youth justice involvement up to age 17§	12	1.6	8	3.6	24	4.7	63	10.0
Entered custody before age 17§	10	1.3	5	2.2	18	3.5	44	7.0

*Excludes children who had been in, or on a waitlist for, public housing.

†Includes children who had been in families receiving short-term private rental assistance but excludes children who had been in public housing.

‡Includes all children who had ever been in public housing.

§Includes children born in 1999 only to ensure follow-up time for Youth Justice to age 17.

notified at least once to child protection also had contact with the housing system, and over 60% of those known to both systems were known to housing first. For additional context, 13.9% of children not known to child protection had contact with the housing system (data not shown). Children known to both systems experienced a greater

burden of hospitalisations, emergency department presentations, developmental vulnerability and a higher likelihood of youth justice system contact. There may be potential for the public housing system to be a focus for prevention efforts in child maltreatment given our findings that over a third of all the children who came to the

attention of child protection by age five were already receiving some form of housing assistance.

A coordinated service approach from agencies providing housing assistance and those providing family support might better meet the needs of some families rather than services operating in isolation. With ongoing support to ensure basic housing needs are met, families may be better able to engage with other support services. Housing workers could be upskilled to provide the relevant outreach and community connections to support parenting-related needs. Using housing as a conduit to community-based support services may be viewed as less threatening because contact and support are provided while delivering a housing benefit rather than in the context of child protection where parenting practices are scrutinised.

Despite their preventive potential, housing agencies are resource constrained and have failed to keep pace with need with 149 000 households waiting housing allocation in 2019.²⁶ A decline in the proportion of public housing stock has occurred alongside housing affordability crisis in Australia putting many households at increased risk of financial stress, which may impact child well-being.²⁷ Unmet demand for homelessness services is also increasing, with 32.7% of individuals with an identified need being unmet in 2017–2018.²⁸ Individuals experiencing family violence comprised 40% of specialist homelessness services clients in 2016–2017, with more than one-fifth of clients (22%) including children under the age of 10.²⁹

Although the findings of this study are based on data drawn from SA and may not be directly generalisable to other locations because of different administrative systems, the qualitative relationship between child protection and housing is likely to be similar, especially in other Australian jurisdictions.

This paper is the first to demonstrate the large overlap between families known to child protection and public housing systems. It is well known that there are multiple drivers of child maltreatment, including family violence, serious mental health issues, and drug and alcohol abuse and that these often co-occur with poverty and poor housing. Secure, safe and stable housing is a fundamental social determinant of health. This study has shown the added health, developmental and criminal justice burden for the substantial proportion of children experiencing both child protection and housing contact. Ensuring the highest quality of supportive early life infrastructure for families in public housing may contribute to prevention of contact with child protection and better life trajectories for children.

Author affiliations

¹BetterStart Health and Development Research, School of Public Health, Faculty of Health and Medical Sciences, The University of Adelaide, Adelaide, South Australia, Australia

²School of Psychology, Faculty of Health and Medical Sciences, The University of Adelaide, Adelaide, South Australia, Australia

³Australian Centre for Housing Research, School of Social Sciences, Faculty of Arts, Business, Law and Economics, The University of Adelaide, Adelaide, South Australia, Australia

⁴Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK

Twitter Emma Baker @_HealthyCities_

Contributors All authors were involved in study conception and design, interpretation of the data and drafting of the manuscript. JWL, RMP, AM and CM were involved in the acquisition of data. AM and CM analysed the data. EB and JWL provided critical revision of the article. CM accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Funding CM, RMP and AM were supported by the Early Intervention Research Directorate, Department for Human Services, South Australian Government. CM is supported by a Discovery Early Career Researcher Award, Australian Research Council (DE200100679). JWL and RMP are supported by a National Health and Medical Research Council of Australia Centre of Research Excellence (1099422).

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the SA Department of Health Human Research Ethics Committee (HREC; 377/06/2013; HREC/13/SAH/106), the University of Adelaide HREC (H-185-2011), and the Aboriginal Health Research Ethics Committee (REC2411/9/14). SA NT Datalink operates under strict data security protocols and implements 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.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available. The data underlying this article were provided by several Australian State and Commonwealth government agencies under agreements with the researchers led by author JWL, SA NT Datalink as the independent linkage authority and multiple ethics committees. Data are only able to be accessed by researchers who have entered into agreements with the Data Custodians and are approved users by the Human Research Ethics Committee. Data can be accessed through an application and approval process administered by the independent data linkage authority, SA NT Datalink.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

Catia Malvaso <http://orcid.org/0000-0003-1227-5434>

REFERENCES

- 1 Gilbert R, Widom CS, Browne K, *et al*. Burden and consequences of child maltreatment in high-income countries. *Lancet* 2009;373:68–81.
- 2 Pilkington R, Grant J, Chittleborough C. *Child protection in South Australia*. BetterStart Child Health and Development Research Group, School of Public Health, University of Adelaide, 2017.
- 3 Pilkington R, Montgomerie A, Grant J. *An innovative linked data platform to improve the wellbeing of children - the South Australian*

- Early Childhood Data Project. Australia's welfare series no. 14. Cat. no. AUS 226. Canberra, 2019.
- 4 Australian Institute of Health and Welfare. *Asthma. data tables*. Canberra: AIHW, 2017.
 - 5 Australian Institute of Health and Welfare. *Child protection Australia: 2018-19*. Canberra: AIHW, 2020.
 - 6 Falster K, Hanly M, Pilkington R, *et al*. Cumulative Incidence of Child Protection Services Involvement Before Age 5 Years in 153 670 Australian Children. *JAMA Pediatr* 2020;174:995-7.
 - 7 O'Donnell M, Maclean M, Sims S, *et al*. Entering out-of-home care during childhood: cumulative incidence study in Canada and Australia. *Child Abuse Negl* 2016;59:78-87.
 - 8 Roulund B, Vaithianathan R. Cumulative prevalence of maltreatment among New Zealand children, 1998-2015. *Am J Public Health* 2018;108:511-3.
 - 9 Putnam-Hornstein E, Mitchell M, Hammond I. Cumulative risk of child protective service involvement before age 5: a population-based examination. 2017, 2018. Available: <http://www.datanetwork.org/research/cumulative-risk-of-child-protective-service-involvement-before-age-5-a-population-based-examination/>
 - 10 Bilson A, Martin KEC. Referrals and child protection in England: One in five children referred to Children's Services and one in nineteen investigated before the age of five. *British Journal of Social Work* 2017;47:793-811.
 - 11 Degli Esposti M, Humphreys DK, Jenkins BM. Long-Term trends in child maltreatment in England and Wales, 1858-2016. *Lancet Public Health* 2019;4:148-58.
 - 12 Child Protection Systems Royal Commission. *The life they deserve: child protection systems Royal Commission report*. Adelaide: Government of South Australia, 2016.
 - 13 Royal Commission and Board of Inquiry into the Protection and Detention of Children in the Northern Territory. *Findings and recommendations*. Canberra: Commonwealth of Australia, 2017.
 - 14 House of Commons Committee of Public Accounts. *Child protection: Thirty-first report of session 2016-17*. London: House of Commons, 2016.
 - 15 Laming WH. *The protection of children in England: a progress report*. London: The Stationery Office for the House of Commons, 2009.
 - 16 Font SA, Warren EJ. Inadequate housing and the child protection system response. *Child Youth Serv Rev* 2013;35:1809-15.
 - 17 Bywaters P, Scourfield J, Jones C, *et al*. Child welfare inequalities in the four nations of the UK. *Journal of Social Work* 2020;20:193-215.
 - 18 Chandler CE, Austin AE, Shanahan ME. Association of housing stress with child maltreatment: a systematic review. *Trauma Violence Abuse* 2022;23:1-21.
 - 19 Cross S, Bywaters P, Brown P. Housing, homelessness and children's social care: Towards an urgent research agenda. *British Journal of Social Work* 2021;1-20.
 - 20 Hernán MA, Hsu J, Healy B. A second chance to get causal inference right: a classification of data science tasks. *Chance* 2019;32:42-9.
 - 21 Holman CD, Bass AJ, Rouse IL, *et al*. Population-Based linkage of health records in Western Australia: development of a health services research linked database. *Aust N Z J Public Health* 1999;23:453-9.
 - 22 Centre for Health Record Linkage. *Quality assurance*, 2012.
 - 23 Australian Bureau of Statistics. *Census of population housing: socio-economic indexes for areas (SEIFA)*. Canberra: Australian Bureau of Statistics, 2011.
 - 24 Brinkman SA, Gregory TA, Goldfeld S, *et al*. Data resource profile: the Australian early development index (AEDI). *Int J Epidemiol* 2014;43:1089-96.
 - 25 StataCorp LLC. *Stata Statistical Software: Release 15 [computer program]*. College Station, TX, 2017.
 - 26 Australian Institute of Health and Welfare. *Housing assistance in Australia 2018*. Canberra: Australian Institute of Health and Welfare, 2018.
 - 27 Rowley S, Ong R. *Housing affordability, housing stress and household wellbeing in Australia. final report No. 192*. Melbourne: Australian Housing and Urban Research Institute, 2012.
 - 28 SCRGSP (Steering Committee for the Review of Government Service Provision). *Report on government services 2019*. Canberra: Productivity Commission, 2019.
 - 29 Australian Institute of Health and Welfare. *Specialist homelessness services report 2016-17*. Canberra: Australian Institute of Health and Welfare, 2017.

Supplementary material: Youth Justice supervision for different BEBOLD birth cohorts allowing for different follow up periods

Table 1. Youth Justice supervision of children with at least one notification to child protection before age 5 with different types of housing system contact, born from 1999-2004

	No housing contact (n = 741)		Short-term private rental assistance only ^a (n = 223)		Listed on a public housing waitlist ^b (n = 512)		Ever in public housing ^c (n = 632)	
	n	% col	n	% col	n	% col	n	% col
Ever supervised by Youth Justice before age 17^d								
Yes	12	1.6	8	3.6	24	4.7	63	10.0
No	729	98.4	215	96.4	488	95.3	569	90.0
Entered custody before age 17^d								
Yes	10	1.3	5	2.2	18	3.5	44	7.0
No	731	98.7	218	97.8	494	96.5	588	93.0
Ever supervised by Youth Justice before age 15^e	n = 2,293		n = 707		n = 1549		n = 2,132	
Yes	29	1.3	22	3.1	53	3.4	163	7.6
No	2,264	98.7	685	96.9	1,496	96.6	1,969	92.4
Entered custody before age 15^e								
Yes	25	1.1	16	2.3	40	2.6	127	6.0
No	2,268	98.9	691	97.7	1,509	97.4	2,005	94.0
Ever supervised by Youth Justice before age 14^f	n = 3,200		n = 1,013		n = 2,038		n = 2,953	
Yes	33	1.0	24	2.4	58	2.8	195	6.6
No	3,167	99.0	989	97.6	1,980	97.2	2,758	93.4
Entered custody before age 14^f								
Yes	29	0.9	18	1.8	45	2.2	157	5.3
No	3,171	99.1	995	98.2	1,993	97.8	2,796	94.7
Ever supervised by Youth Justice before age 12^g	n = 5,292		n = 1,729		n = 3,046		n = 4,556	
Yes	39	0.7	26	1.5	64	2.1	221	4.9
No	5,253	99.3	1,703	98.5	2,982	97.9	4,335	95.1
Entered custody before age 12^g								
Yes	35	0.7	20	1.2	50	1.6	182	4.0
No	5,257	99.3	1,709	98.8	2,996	98.4	4,374	96.0

^a Excludes children who had been in, or on a waitlist for, public housing

^b Includes children who had been in families receiving short-term private rental assistance but excludes children who had been in public housing

^c Includes all children who had ever been in public housing

^d Includes children born in 1999 only to ensure follow-up time for Youth Justice to age 17

^e Includes children born in 1999-2001 only with follow-up time for Youth Justice to age 15

^f Includes children born in 1999-2002 only with follow-up time for Youth Justice to age 14

^g Includes children born in 1999-2004 only with follow-up time for Youth Justice to age 12

Supplementary material: Youth Justice supervision for different BEBOLD birth cohorts allowing for different follow up periods

Table 1. Youth Justice supervision of children with at least one notification to child protection before age 5 with different types of housing system contact, born from 1999-2004

	No housing contact (n = 741)		Short-term private rental assistance only ^a (n = 223)		Listed on a public housing waitlist ^b (n = 512)		Ever in public housing ^c (n = 632)	
	n	% col	n	% col	n	% col	n	% col
Ever supervised by Youth Justice before age 17^d								
Yes	12	1.6	8	3.6	24	4.7	63	10.0
No	729	98.4	215	96.4	488	95.3	569	90.0
Entered custody before age 17^d								
Yes	10	1.3	5	2.2	18	3.5	44	7.0
No	731	98.7	218	97.8	494	96.5	588	93.0
Ever supervised by Youth Justice before age 15^e	n = 2,293		n = 707		n = 1,549		n = 2,132	
Yes	29	1.3	22	3.1	53	3.4	163	7.6
No	2,264	98.7	685	96.9	1,496	96.6	1,969	92.4
Entered custody before age 15^e								
Yes	25	1.1	16	2.3	40	2.6	127	6.0
No	2,268	98.9	691	97.7	1,509	97.4	2,005	94.0
Ever supervised by Youth Justice before age 14^f	n = 3,200		n = 1,013		n = 2,038		n = 2,953	
Yes	33	1.0	24	2.4	58	2.8	195	6.6
No	3,167	99.0	989	97.6	1,980	97.2	2,758	93.4
Entered custody before age 14^f								
Yes	29	0.9	18	1.8	45	2.2	157	5.3
No	3,171	99.1	995	98.2	1,993	97.8	2,796	94.7
Ever supervised by Youth Justice before age 12^g	n = 5,292		n = 1,729		n = 3,046		n = 4,556	
Yes	39	0.7	26	1.5	64	2.1	221	4.9
No	5,253	99.3	1,703	98.5	2,982	97.9	4,335	95.1
Entered custody before age 12^g								
Yes	35	0.7	20	1.2	50	1.6	182	4.0
No	5,257	99.3	1,709	98.8	2,996	98.4	4,374	96.0

^a Excludes children who had been in, or on a waitlist for, public housing

^b Includes children who had been in families receiving short-term private rental assistance but excludes children who had been in public housing

^c Includes all children who had ever been in public housing

^d Includes children born in 1999 only to ensure follow-up time for Youth Justice to age 17

^e Includes children born in 1999-2001 only with follow-up time for Youth Justice to age 15

^f Includes children born in 1999-2002 only with follow-up time for Youth Justice to age 14

^g Includes children born in 1999-2004 only with follow-up time for Youth Justice to age 12