



Investigating the mental health of children exposed to domestic and family violence through the use of linked police and health records

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ANROWS Acknowledgement of Country

ANROWS acknowledges the Traditional Owners of the land across Australia on which we work and live. We pay our respects to Aboriginal and Torres Strait Islander Elders past, present and future, and we value Aboriginal and Torres Strait Islander histories, cultures and knowledge. We are committed to standing and working with Aboriginal and Torres Strait Islander peoples, honouring the truths set out in the [Warawarni-gu Guma Statement](#).

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Acknowledgement of lived experiences of violence

ANROWS acknowledges the lives and experiences of the women and children affected by domestic, family and sexual violence who are represented in this report. We recognise the individual stories of courage, hope and resilience that form the basis of ANROWS research.

ANROWS acknowledges that children and young people living in homes where domestic and family violence (DFV) is present are not simply “exposed” to DFV – they are experiencing it. There are no circumstances in which children and young people are exposed to DFV and are not also being impacted by this violence. Therefore, ANROWS will always default to using “experienced DFV” instead of “were exposed to DFV” or “witnessed DFV”. This language aligns with the *National Plan to End Violence Against Women and Children* (due for finalisation in 2022), which recognises that children experience DFV as victims in their own right, and also seeks to honour the voices of victims and survivors who have felt minimised, erased or unacknowledged as childhood survivors.

Please note that in this report, the authors have chosen to use the term “exposed to DFV”, and have provided a rationale for this choice in the “Definitions and key concepts” section.

Caution: Some people may find parts of this content confronting or distressing. Recommended support services include 1800RESPECT (1800 737 732), Lifeline (13 11 14) and, for Aboriginal and Torres Strait Islander people, 13YARN (13 92 76).

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Acronyms

ABS	Australian Bureau of Statistics	IDEA	Intellectual Disability Exploring Answers
AEDC	Australian Early Development Census	IMS	Incident Management System
AIFS	Australian Institute of Family Studies	MHIS	Mental Health Information System
AIHW	Australian Institute of Health and Welfare	PTSD	Post-traumatic stress disorder
ANROWS	Australia's National Research Organisation for Women's Safety	RANZCP	Royal Australian and New Zealand College of Psychiatrists
ARIA	Accessibility/Remoteness Index of Australia	SD	Standard deviation
CALD	Culturally and linguistically diverse	SAS	Statistical Analysis System
CI	Confidence interval	SEIFA	Socioeconomic Indexes for Areas
DSM-5	Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition)	SES	Socioeconomic status
DFV	Domestic and family violence	SNAICC	Secretariat of National Aboriginal and Islander Child Care
EDDC	Emergency Department Data Collection	UN	United Nations
HMDC	Hospital Morbidity Data Collection	UNICEF	United Nations Children's Fund
HPA axis	Hypothalamic-pituitary-adrenal axis	VIF	Variance inflation factors
ICD	International Classifications of Disease	WARDA	Western Australian Register of Developmental Anomalies
ICD-9	International Classifications of Disease Ninth Edition	WHO	World Health Organization
ICD-10AM	International Classifications of Disease 10th Edition Australian Modification		

Definitions and concepts

Domestic and family violence

Domestic and family violence (DFV) refers to the threat of, or acts of, violence or abuse of a physical, non-physical and/or sexual nature between people who are currently or have previously been in an intimate relationship (Council of Australian Governments, 2011). The central component of DFV is an ongoing pattern of behaviour aimed at controlling a person through fear by use of violent and/or threatening behaviour (Council of Australian Governments, 2011). The acts can be both criminal and non-criminal.

Women subjected to DFV

Debate exists in regard to the use of the terms “victim” and/or “survivor”. Due to the stigma attached, those living with DFV frequently object to the use of either term (Papendick et al., 2017). As this report uses population linked administrative data, the individual journey of those abused, whether they have started the recovery process or not, and their preference for the use of the term “victim” and/or “survivor” is unknown. Therefore, the term “subjected to DFV” is used throughout this report to describe a woman who has been abused by a man in the context of DFV.

Identification of DFV

This report captures DFV perpetrated by men against women. While men can also be victims of DFV perpetrated by a partner of the same or different sex (AIHW, 2018b), DFV is a gendered act that is disproportionately perpetrated by men against women (European Institute for Gender Inequality, 2017; World Health Organization [WHO], 2014). Recognising the gendered patterns of DFV does not negate the experiences of men who are subjected to DFV. It does, however, acknowledge the need to address the issue through a gendered lens. Therefore, in the context of this report, “DFV” refers to DFV perpetrated by men against women.

Perpetrator

The men who commit acts of DFV are referred to as “perpetrators”. “Perpetrator” is the term used in the *National Outcome Standards for Perpetrator Interventions* (National Outcome Standards; Council of Australian Governments, 2015) to describe men who commit DFV against women. While the phrase “men who use violence” is preferred by some (Heward-Belle et al., 2019) because it labels the behaviour rather than the person (Council of Australian Governments, 2015), the term “perpetrator” reinforces the serious nature of DFV. The term includes all men who commit one or more identified acts of DFV.

Child

The term “child/children” will be used to capture those under the age of 18 as used in the *Children and Community Services Act 2004* (WA).

Exposure to DFV

Within the literature there is a lack of common terminology and definitions of children exposed to DFV, despite this issue being acknowledged more than 30 years ago (Fantuzzo & Lindquist, 1989). DFV literature often uses the terms “witnessed” or “exposed to” and at times they are used interchangeably (Berg et al., 2020; Howarth et al., 2016; Kitzman et al., 2003; Spilsbury et al., 2008). The term “witness” is restrictive in the context of DFV. Far from being passive observers, children experience DFV with all of their senses (Devaney, 2015). Moreover, the dichotomy of whether a child observed or overheard violence or not is too simplistic (Holden, 2003). The child may not always observe DFV; the abuse may be psychological and controlling behaviour by the perpetrator and not physically visible to the child, but they are still aware that the abuse is happening (Överlien & Hydén 2009; Swanston et al., 2014). Holden (2003) argues that the term “exposed to” is more inclusive of the different types of experiences of the child and does not assume that the child observed the DFV. Holden developed a taxonomy of exposure that is separated into 10 discrete categories (see Table 1). The taxonomy ranges from the child being actively involved in the DFV to the child being ostensibly unaware of it. In this report the term “exposure to DFV” will be used to ensure the capture of the child’s full experience, the scope of which is defined in Table 1.

International Classification of Disease codes

International Classification of Disease (ICD) codes are standardised medical classification codes authorised by the World Health Organization (WHO) for the classification of diseases, injuries, health encounters, social circumstances, external causes of injury or diseases, and inpatient procedures in morbidity (health) settings. The ICD classification is used globally. Some countries, however, have modified it to better suit their needs. Within Australia, the current ICD codes have been amended to suit Australian needs and are known as the ICD-10 Australian Modification (ICD-10-AM).

Aboriginal and Torres Strait Islander

The data used in this report contained a variable that identified a combined Aboriginal and Torres Strait Islander status (see Christensen et al., 2014). Therefore, in this report, the term “Aboriginal and Torres Strait Islander” is used in preference to “Indigenous” or “Aboriginal”.

Culturally and linguistically diverse

There is considerable inconsistency in how culturally and linguistically diverse (CALD) status is defined within Australia (Pham et al., 2021). CALD can often include those born overseas, those having a parent born overseas, those whose main language spoken at home is not English, and particular religious affiliations (Australian Institute of Health and Welfare [AIHW], 2018a; Pham, 2021). The term “CALD” in this report will include those children with one or both parents born overseas, including the United Kingdom and New Zealand (AIHW, 2018a).

Table 1: A taxonomy of children's exposure to domestic violence: Type of exposure (adapted from Holden, 2003, p. 152)

Type of exposure	Definition	Examples
Exposed prenatally	Real or imagined effects of DFV on the developing foetus	Foetus assaulted in utero; pregnant mother lived in terror; mothers perceived that the DFV during pregnancy had affected their foetus
Intervenes	The child verbally or physically attempts to stop the assault	Asks parents to stop; attempts to defend mother
Victimised	The child is verbally or physically assaulted during an incident	Child intentionally injured, accidentally hit by a thrown object, etc.
Participates	The child is forced to or "voluntarily" joins in the assaults	Coerced to participate; used as spy; joins in taunting mother
Eyewitness	The child directly observes the assault	Watches assault or is present to hear verbal abuse
Overhears	The child hears, though does not see, the assault	Hears yelling, threats or breaking of objects
Observes the initial effects	The child sees some of the immediate consequences of the assault	Sees bruises or injuries; police; ambulance; damaged property; intense emotions
Experiences the aftermath	The child faces changes in their life as a consequence of the assault	Experiences maternal depression; change in parenting; separation from father; relocation
Hears about it	The child is told or overhears conversations about the assault	Learns of the assault from mother, sibling, relative or someone else
Ostensibly unaware	The child does not know of the assault, according to the source	Assault occurred away from home or while child was away; or occurred when mother believed child was asleep

Disability As a concept, disability is complex, dynamic, multidimensional and contested (WHO, 2011a). The term "disability" has divergent meanings with no national or international consensus on how it is defined. In the study contained in this report, a child was defined as having disability if they had a diagnosis for autism, intellectual disability, Down syndrome, cerebral palsy or birth defect. This definition of disability has been used in previous research (e.g. Maclean, Sims et al., 2017). However, the definition of disability used in this report is narrower than that captured in the Australian Bureau of Statistics (ABS; 2016a) due to limitations in the data.

Ecological framework The ecological model was the conceptual framework for the study and informed data analysis. The model was introduced in the 1970s by Urie Bronfenbrenner (1977) to explain how the interactive environment affects a child's growth and development. While the ecological model was originally used to explain children's growth and development, an ecological approach to public health issues, such as DFV, has become a more distinctive feature of prevention and promotion in contemporary public health (Richard et al., 2011). The model is a prominent explanatory framework used by the WHO to understand the interplay of personal, situational and socio-cultural factors that influence violence against women (Ellsberg & Heise, 2005; WHO, 2022).

Mental health	The WHO (2018) defines mental health as the state of wellbeing in which an individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community (WHO, 2018).
Internalising behaviours	Internalising behaviours are described as “inner-directed and generating distress in the individual” (Forns et al., 2018, p. 519). Types of internalising behaviours include anxiety, dysphoria and depression.
Externalising behaviours	Externalising behaviours are a group of behaviour problems that are “outer-directed generating discomfort and conflict in the surrounding environment” (Forns et al., 2018, p. 519). These behaviours include substance misuse, impulsivity, aggressiveness and disruptiveness.
Mental health service contact	An instance of contact or service provision by an agency to an individual which was recorded in the administrative data of the agency.
Mental health services	The collective term used in this report to represent the “agency” encompassing mental health services (these include contacts with public community mental health services, a public or private hospital admission, and presentation for a mental health-related condition).

Executive summary

Background

Existing literature highlights that exposure to domestic and family violence (DFV) is associated with poorer mental health in childhood (Carter et al., 2020; Gartland et al., 2021; Herrenkohl et al., 2008; Orr, Fisher, Preen et al., 2020). However, the literature is limited by the predominant use of studies focused on a short period of time with little account given to the mental health impacts that may occur over time. Existing research has also focused on the grouping of mental health issues into internalising and externalising behaviours (Vu et al., 2016) which can restrict targeted interventions.

Additionally, there is a need to conduct research in an Australian context given the disparity in rates of both exposure to DFV (Australian Bureau of Statistics [ABS], 2016b; Orr, Preen et al., 2019) and mental illness (Al-Yaman, 2017) for Aboriginal and Torres Strait Islander children. Furthermore, Australia has a long history of migration (Collins, 2013). The most recent Australian Census (ABS, 2021a) reported that 62 per cent of Western Australians have one or both parents born overseas. Evidence is lacking on the outcomes of children who are exposed to DFV and culturally and linguistically diverse (CALD). Additionally, within Australia, 8 per cent of children under 15 have disability (ABS, 2019). The greater dependency of children with disability on carers and family support and the time spent in the family home are thought to place the child at greater risk of DFV exposure (Baldry et al., 2006). The effects of DFV exposure on children with disability remain poorly understood (Dababnah et al., 2018).

Aim and objectives

The aim of this research was to identify the mental health service use and diagnoses of children exposed to DFV in Western Australia between 1987 and 2016.

The specific objectives were to:

1. Examine the mental health service use and trajectories of children exposed to DFV and ascertain the differences in sociodemographic characteristics and service use between exposed and non-exposed children.
- 2a. Identify mental health diagnosis types for children exposed to DFV compared to non-exposed children.
- 2b. Identify key sociodemographic and clinical characteristics predictive of mental health diagnosis and diagnosis subtypes of children with known DFV.
3. Examine differences in mental health service use and diagnosis types in Aboriginal and Torres Strait Islander children and non-Aboriginal and Torres Strait Islander children who are exposed to DFV as well as other sub-populations of children, including those from CALD backgrounds and children with disability, who are exposed to DFV.

Methods

This study comprised a population-based retrospective cohort study of children born in Western Australia between 1987 and 2010 who were exposed to DFV. Exposure to DFV was initially identified in the Western Australia Police Force Information Management System (IMS) when a child's mother was identified (in Western Australia) as being subjected to DFV from 2004 to the end of 2008, a male perpetrator was charged for the offence and a domestic relationship indicator was recorded. There were 15,598 children born to mothers who were identified as victims of DFV in the Western Australia Police Force IMS. The children were firstly matched in a ratio of 1:3 to a non-DFV-exposed cohort of children based on month of birth, socioeconomic status (SES), Aboriginal and Torres Strait Islander status, and sex. Due to the hidden nature of DFV we also examined non-exposed children for any maternal DFV hospitalisations by interrogating the Western Australian hospital records of their mothers from 1979 to 2016 (inclusive) using International Classification of Diseases (ICD) codes (WHO, 2011b). We found that 4,442 originally "non-exposed" children had a mother who had a hospitalisation indicating DFV. The children exposed to DFV were then restricted to those who were between the ages of 0 and 18 when the identified DFV occurred. This approach resulted in an exposed cohort of 16,356 and a non-exposed cohort of 41,996.

Aboriginal and Torres Strait Islander children were identified by the Western Australian Data Linkage Branch derived Aboriginal status flag. Disability was identified from three sources: 1) the child was recorded in the Western Australian

Register of Developmental Anomalies (WARDA) datasets as having a birth defect or cerebral palsy; 2) intellectual disability was captured in the Intellectual Disability Exploring Answers (IDEA) database; or 3) ICD codes were used to identify disability in Hospital Morbidity Data Collection (HMDC) records. CALD children were identified from the WA Registry of Births, Deaths and Marriages where one or both parents were born overseas.

Mental health service use was defined as a child having had any mental illness-related diagnosis across the HMDC, Mental Health Information System (MHIS) and Emergency Department Data Collection (EDDC) datasets during the follow-up period. Children were followed until they reached 18 years of age, date of death or until the end of follow-up period in 2017, whichever came first. Only a child's first mental illness-related contact after DFV (across the three data collections) was considered for modelling purposes relating to overall service contact.

Mental health diagnosis was identified across the three data collections (HMDC, EDDC and MHIS) utilising ICD codes. The diagnoses were categorised into 10 main groupings: organic disorder, substance use disorder, schizophrenia and psychoses, depressive disorder, anxiety disorder, personality disorder, psychological development disorder, intentional self-harm, other mental illness-related contacts, and mental health contact with no diagnosis recorded.

Multiple approaches to statistical analysis were undertaken.

Results

Children exposed to DFV had a statistically significant 49 per cent increased risk of mental health service contact when compared with non-exposed children. On average the children were exposed to DFV when aged 6.5 years, however, the children were, on average, aged 12.5 years at mental health service contact. Almost half of children exposed to DFV had a mother with a mental health contact (45%) – this was more than double the proportion seen in non-exposed children (21%).

Over time, children exposed to DFV had a 79 per cent chance of having a mental health contact by age 18, whereas for children not exposed to DFV, the chance of having a mental health service contact was 16 per cent by age 18.

Children exposed to DFV had a higher risk of having a diagnosis in eight of the 10 mental health subcategories compared to their non-exposed peers. This ranged from a 19 per cent increased risk in psychological development disorders (which include behavioural and emotional disorders) to a 99 per cent increased risk in substance use disorder. Only the categories “organic disorder” (including cerebral dysfunction) and “other mental illness-related contacts” showed no significant risk increase for children exposed to DFV when compared to non-exposed children.

Aboriginal and Torres Strait Islander children were overrepresented in our exposed cohort when compared to the state of Western Australia. According to the 2016 Census (ABS, 2018c), only 7 per cent of people under 18 in Western Australia were Aboriginal and Torres Strait Islander compared to 62 per cent of children in our exposed group. Possible reasons as to why Aboriginal and Torres Strait Islander children were overrepresented in this cohort are explored in subsequent sections discussing the study's findings and its strengths and limitations. For Aboriginal and Torres Strait Islander children exposed to DFV, being born to a mother aged under 30 was associated with a decreased risk of mental health service contact of 18 per cent to 25 per cent, compared to those with an older mother. However, for non-exposed Aboriginal and Torres Strait Islander children, maternal age was not associated with mental health service contact.

For children with disability who were exposed to DFV, being born pre-term was associated with a 23 per cent increased risk of mental health service contact when compared to DFV-exposed children born at term. However, being born early was not a risk for mental health service contact in children with disability who were not exposed to DFV.

Due to limitations in the data, outcomes for CALD children were unable to be investigated.

Strengths and limitations

The main strength of the research was the use of population-level administrative data, linked across multiple agencies, at both the child and parent level to investigate the mental health of children exposed to DFV. The use of linked police and hospital data to identify DFV exposure enabled investigations of high-risk groups not captured in previous mental health research.

While the use of linked administrative data provides many advantages, there are some limitations that should be noted. The children identified as exposed to DFV in this report were only recognised because of the mother's involvement in police or hospital services. As such, the data may be subject to selection bias, capturing mainly physical cases of DFV, and may underestimate the impact of DFV exposure on children's mental health outcomes due to the fact that not all children exposed to DFV were captured. It is therefore likely that the estimates presented in this report are conservative estimates of the association between DFV and the mental health of children exposed to DFV.

Furthermore, Aboriginal and Torres Strait Islander children were overrepresented in the cohort. This could be, in part, due to the police records of DFV requiring a charge to be made against the man; there is evidence to suggest that the likelihood of being charged for DFV is increased by a variety of socioeconomic and demographic characteristics, such as Aboriginal status (Cunneen, 2010; Jeffries & Bond, 2015). Additionally, DFV was identified in maternal hospital records where Aboriginal and Torres Strait Islander women are overrepresented (Orr, Preen et al., 2019).

The capture of mental illness in children was identified by public and private hospitalisations, emergency department (ED) attendance and public outpatient mental health services. Many children with mental illness will not be identified in these data.

Implications for policy and practice

DFV exposure is associated with an increased risk of mental health service contact and diagnosis of mental illness. Early intervention is required. Many children exposed to DFV are not engaged in mental health services until years after the exposure. Additionally, the findings add further support for the need for a dedicated standalone national response and strategy for the mental health of children exposed to DFV (Australian Government, 2021).

Children exposed to DFV often live with complex issues such as maternal mental illness and disability. Therefore, services to support these children must be well resourced and holistically focused with collaborative, multidisciplinary teams and cross-agency collaboration that provides continuity of care for children and their families with multiple and complex issues.

To support children and families, it is important that mental health clinicians are aware of trauma, including DFV exposure, during childhood. Clinicians need to have knowledge of DFV and its implications for mental health as well as the ability to appropriately and safely respond to children exposed to DFV (McTavish et al., 2016). These skills need to be taught to clinicians during their training and offered as ongoing professional development to enable clinicians to stay abreast of contemporary developments. At present DFV training is not part of the mandatory suite of training across Western Australian health services. A national approach should be taken to ensure that all registered and non-registered staff within public, private and NGO health services are provided with DFV training.

Aboriginal and Torres Strait Islander peoples were overrepresented in the exposed cohort. Such overrepresentation reaffirms calls from Aboriginal and Torres Strait Islander communities that Aboriginal and Torres Strait Islander peoples should receive sufficient investment to develop policies and programs to support Aboriginal and Torres Strait Islander children.

Children exposed to DFV are not engaged in mental health services until years after exposure. To best support children exposed to DFV, early intervention is required. These children

and their families are in contact with multiple agencies that may include education, health, police and child protection, and each provides a potential point of intervention. As such, it is imperative that these agencies, along with children's mental health services, are embedded in, and part of, a broader collaborative, multiagency and multidisciplinary response to DFV, and are adapted to "fit" with the existing local response to DFV and avoid unwarranted duplication of services.

To support service engagement and reduce the re-traumatisation of children exposed to DFV, service responses must be trauma-informed and culturally responsive and secure.

Exposure to DFV is associated with an increased risk of mental health disorders in children. Our findings highlight the importance of the continuation of collective prevention efforts nationally and in each jurisdiction to reduce and eradicate DFV.

Directions for future research

There is a substantial period of time between children's exposure to DFV and their contact with mental health services. Early access to mental health services is important for children as it can reduce the long-term impact of mental illness (MacDonald et al., 2018). Therefore, it is imperative that future research investigates factors associated with delay in service contact for children exposed to DFV as a priority.

It is acknowledged that children with mental health issues are more likely to have mental health issues in adulthood (Kessler et al., 2005; Ravens-Sieberer et al., 2015). Future research is needed to investigate the mental health of the children exposed to DFV into their adulthood. As young people with complex needs are at greater risk of "falling through the gaps" in care transition to adult services (Singh, 2009), attention to those exposed to DFV is needed.

There is a need for research driven by Aboriginal and Torres Strait Islander peoples on the mental health of Aboriginal and Torres Strait Islander children given the disproportionate exposure to DFV of these children. The findings contained in this report have the potential to be a stepping stone from

which a holistic, culturally appropriate program of research can be developed.

To gain a greater understanding of the effect exposure to DFV has on children's mental health, further research is required utilising multiple sources of linked data to identify both DFV and mental illness. The linked data should be complemented by combining data from population-based surveys, longitudinal surveys and social indicators (Hertzman & Williams, 2009). This multiple source approach would largely overcome the limitations of using each source separately and benefit from the strengths of each.

Conclusion

Findings from this research have shown that exposure to DFV in childhood is associated with an increased risk of mental health service contact and mental health diagnosis during childhood. The use of population-level linked administrative data has enabled the identification of sociodemographic characteristics that are associated with mental health service contact and diagnosis categories in children exposed to DFV. Additionally, the longitudinal data has provided a picture of mental health service contact over time for Western Australian children exposed to DFV. The research also offers new insights into the impact DFV has on Aboriginal and Torres Strait Islander children and children with disability.

Introduction

This report outlines the findings of a retrospective cohort study that used linked de-identified administrative data. The aim of the study was to identify the mental health outcomes of children born in Western Australia who were exposed to domestic and family violence (DFV).

Context for research

Domestic and family violence in Australia

It is difficult to accurately identify the extent of DFV in the Australian population. By their nature DFV incidents often occur at home or in other private spaces – “behind closed doors” – and are often concealed and denied by both the perpetrator and those subjected to the violence (Australian Institute of Health and Welfare [AIHW], 2018b; Phillips & Vandenbroek, 2014). The ability of data sources to measure DFV is dependent on the victim’s perception of DFV, their willingness to disclose and/or how the incident is reported (Australian Bureau of Statistics [ABS], 2017a). Global estimates of DFV suggest that almost 33 per cent of women who have been in an intimate partner relationship have experienced physical or sexual violence by an intimate partner in their lifetime (World Health Organisation [WHO], 2020a). Within Australia, DFV perpetrated by a current or former intimate partner is a widespread issue with a lifetime prevalence of 25 per cent (ABS, 2017a). The Australian *Personal Safety Survey* reports data on women who have been subject to DFV perpetrated by a partner in the previous 12 months. Rates of DFV have remained relatively stable over the past decade, with a slight increase in the latest (2016) survey report: 1.5 per cent of the population were subjected to DFV in 2005 and 2012, increasing to 1.7 per cent in 2016 (ABS, 2017a). DFV occurs at high rates among Aboriginal and Torres Strait Islander women (ABS, 2016b), with 10 per cent of Aboriginal and Torres Strait Islander women informing the 2015 *National Aboriginal and Torres Strait Islander Social Survey* that they had been victims of DFV by an intimate partner or a family member in the preceding 12 months (ABS, 2016b).

Aboriginal and Torres Strait Islander peoples hold distinctive rights as Australia’s First Peoples, set out in international law (Australian Human Rights Commission, 2015). Additionally, in 2009, Australia gave its formal support to the United Nations Declaration on the Rights of Indigenous People.

However, despite these distinctive rights and as a result of colonisation and systemic racism, Aboriginal and Torres Strait Islander communities are considered among the most vulnerable groups in Australia (Australian Human Rights Commission, 2015). The *National Plan to Reduce Violence against Women and their Children 2010–2022* (Council of Australian Governments, 2011) acknowledges the disproportionate rates of DFV experienced by Aboriginal and Torres Strait Islander women as a national priority. DFV is not part of traditional Aboriginal and Torres Strait Islander cultures (Blagg et al., 2020; Our Watch, 2018; Wilson et al., 2017). The disproportionate rates largely stem from deep and complex issues around dispossession and intergenerational trauma resulting from the legacy of colonisation, including systemic racism and forced removal of children (Secretariat of National Aboriginal and Islander Child Care [SNAICC], 2017). As part of this study, we explored rates of DFV and mental health disorders among both Aboriginal and Torres Strait Islander women and children and non-Indigenous women and children. In understanding the rates at which different groups experience DFV and mental ill health, research can better inform recommendations for future policy and practice including resource distribution and future research priorities.

Help-seeking by women

The most recent Australian *Personal Safety Survey* highlighted that around half of women (46%) who are subjected to DFV do not disclose the abuse (ABS, 2017a). A multitude of reasons have been identified: stigma, fear, lack of a safe place to disclose (García-Moreno et al., 2005; Keeling & Fisher, 2015), or believing they can deal with it themselves or that it is not serious enough to seek help (ABS, 2017a). There is also fear of child removal, a particular concern for Aboriginal and Torres Strait Islander women (Australia’s National Research Organisation for Women’s Safety [ANROWS], 2020a). Of the Australian women who do seek assistance, 53 per cent reportedly seek help from a health professional (33% from a general practitioner and 20% from another health professional) and 17 per cent from police (ABS, 2017a).

Children’s exposure to DFV

Children’s exposure to DFV is a prominent human rights issue. The United Nations Convention on the Rights of the Child (United Nations General Assembly, 1989) states that

children have a universal right to live free from all forms of violence, including exposure to DFV. As a signatory to this Convention, Australia has international obligations to protect children from exposure to DFV, including acting to prohibit, prevent and respond to DFV through legislative, judicial, social and educational measures. The most recent report to the UN Committee on the Rights of the Child (Australian Human Rights Commission, 2018) on Australia's implementation of children's rights recommended the Australian Government increases prevention measures and responses to DFV that address its distinct impacts on children.

Domestic and family violence exposure and child mental health

Due to the hidden nature of DFV and the stigma attached, it is difficult to ascertain the prevalence of children's exposure to DFV. The Australian *Personal Safety Survey* (ABS, 2017a) reported that 11 per cent of adult respondents had witnessed violence against their mother by their mother's partner before the age of 15. Additionally, 49 per cent of the women identified in the survey data as being assaulted by their current partner reported that they had children in their care at the time, with the child hearing or seeing the violence (ABS, 2017a). Research by Indermaur (2001) has suggested that one in four young Australians (12 to 20 years) have been exposed to at least one incident of DFV against their mother or carer. This figure rises to 42 per cent among Aboriginal young people (12 to 20 years; Indermaur, 2001).

Exposure to DFV in childhood has been associated with poor mental health (e.g. Hultmann et al., 2020; Vu et al., 2016). However, much of the literature is from outside of Australia with little account given to the impacts that may occur over time, and more comprehensive evidence is needed. The use of longitudinal linked administrative data provides a means to gain a greater understanding of the long-term impact of DFV exposure on children's mental health. Poor mental health is a public health concern, and it is estimated that one in seven Australian children aged 4 to 17 years (Goodsell et al., 2017) and almost one in four Aboriginal children aged 5 to 10 years (Shepherd et al., 2017) have a mental health disorder.

Call for research

Authors of this report undertook a "priority setting partnership" process involving those with lived experience, support people and DFV service providers (Fisher et al., 2016) in order to identify community priorities for DFV research. The partnership highlighted that researching the outcomes of children exposed to DFV was a top priority. Additionally, a recent Australian Government report (AIHW, 2018b) highlighted that there are limited data available on the experiences of children exposed to DFV and noted that data sources such as police data and longitudinal data would contribute to a more comprehensive picture of those exposed and subjected to DFV. Additionally, *Australia's National Research Agenda to Reduce Violence against Women and their Children: ANRA 2020–2022* (ANROWS, 2020b) highlights the need to investigate the short- and long-term emotional and psychological impacts of DFV on children as a priority. Furthermore, the *National Agreement on Closing the Gap* (Commonwealth of Australia. Department of the Prime Minister and Cabinet, 2021) highlights a reduction in incidents of DFV for Aboriginal and Torres Strait Islander families as a key target and highlights the need to explore data development to measure and report the impact of DFV on children.

Study setting

Western Australia is a geographically large state within Australia covering 2.5 million square kilometres. In the 2016 Australian Census the population of Western Australia was almost 2.5 million, with 1.9 million (76%) people residing in the Greater Perth area (ABS, 2021a), an area of almost 6,500 square kilometres. The Western Australian population has a median age of 36 years (ABS, 2017b), with 23 per cent of the population comprised of children 0 to 18 years of age (ABS, 2017c), and 3 per cent of the population is Aboriginal and Torres Strait Islander (ABS, 2021a). A quarter of Aboriginal and Torres Strait Islander peoples in Western Australia reside in very remote locations, with 40 per cent living in major cities. This is in contrast to 80 per cent of non-Aboriginal and Torres Strait Islander Western Australians who live

in major cities (ABS, 2017d). The most recently available data has shown the Western Australian population to be representative of the Australian national population on key sociodemographic, health and economic indicators (Clark et al., 2010).

Aim and objectives

Aim

The aim of this research was to identify the mental health service use and diagnoses of children exposed to DFV in Western Australia between 1987 and 2016.

Objectives

The specific objectives were to:

1. Examine the mental health service use and trajectories of children exposed to DFV and ascertain the differences in sociodemographic characteristics and service use between exposed and non-exposed children.
- 2a. Identify the mental health diagnosis types for children exposed to DFV compared to non-exposed children.
- 2b. Identify key sociodemographic and clinical characteristics predictive of mental health diagnosis and diagnosis subtypes of children with known DFV.
3. Examine differences in mental health service use and diagnosis types in Aboriginal and Torres Strait Islander children and non-Aboriginal and Torres Strait Islander children who are exposed to DFV as well as other sub-populations of children, including those from CALD backgrounds and children with disability, who are exposed to DFV.

Structure of this report

This report begins with a review of existing literature, followed by a description of the methodology utilised. The key findings are then presented and are followed by a discussion that provides some interpretation of these findings in relation to the existing literature. The report concludes with the implications of the findings of the study for policy and practice.

State of knowledge review

A state of knowledge review was undertaken to situate the current study among the literature that focuses on children's exposure to DFV with attention to the factors that impact their mental health.

Review methodology

This state of knowledge review was undertaken as a narrative literature review, an approach used to review and critique available evidence on a given topic or field. Narrative literature reviews are useful in providing a comprehensive overview of the topic and highlighting gaps in existing literature.

To complete this review a number of relevant databases were searched including:

- CINAHL
- Cochrane Library
- JSTOR
- Global Health via Ovid
- MEDLINE via PubMed
- SAGE
- ProQuest 5000
- PsycINFO
- Web of Science

Multiple combinations of keywords to source pertinent information were included: intimate, domestic, gender, family, violence, child, mental health, psychiatric, development, and exposure. As the literature on the outcomes of children exposed to DFV is relatively new, no year limit was set in publication searches. Research that was not published in English was excluded. The references listed in each of the sourced materials were scanned for additional relevant sources. Online searches were used to search for relevant government and non-government organisation publications and additional "grey literature".

The final materials included in this review were original research, grey literature and unpublished reports.

The impact of DFV exposure

While many studies have investigated the impact of DFV on women, it is only in recent years that significant steps have been made to understand the impact of DFV exposure on children (Kuhlman et al., 2012), with children often referred to as "forgotten victims" (e.g. Reif & Jaffe, 2019; UNICEF, 2006).

Stress response

DFV is considered to be one of the most prevalent stressors children can experience (Margolin & Gordis, 2000), with significant evidence that environmental stressors play a major role in modifying physical and psychological health (e.g. Bair Merritt et al., 2012; Bradley & Dinan, 2010; Juruena et al., 2020). The biological mechanisms linking stress to ill-health, however, are not fully understood, but emerging literature points to a central role of the hypothalamic–pituitary–adrenal axis (HPA axis) function (Juruena et al., 2020; Margolin & Gordis, 2000). The HPA axis is an essential stress response system that enables appropriate response to stressors. While this stress response is vital to adapt to everyday stressors, chronic activation due to exposure to stressful events can challenge physiological response systems, increasing the risk for physical and psychological ill-health (Cohen et al., 2007; Juruena et al., 2020; Kiecolt-Glaser & Glaser, 2005; Mueller & Tronick, 2019).

Mental health

Existing literature has acknowledged that children exposed to DFV may experience delays in cognitive and emotional development (Antle et al., 2010; Mueller & Tronick, 2019) and an increased risk of mental illness (Carter et al., 2020; Herrenkohl et al., 2008; Huang et al., 2021; Kennedy et al., 2010; Kimball, 2016; Orr, Fisher, Preen et al., 2020). An Australian prospective pregnancy cohort study (Gartland et al., 2021) examined the mental health of children exposed to DFV and found that by 10 years of age, they were twice as likely to have anxiety as non-exposed children. Outside of Australia, a study by Olaya and colleagues (2010) captured an older range of children (8 to 17 years) attending a public mental health centre in Spain, and found that children exposed to DFV were twice as likely to have depression than non-exposed children. Similarly, Huang and colleagues' (2021) longitudinal study

of the Fragile Families and Child Well-being Study of over 200,000 children in the United States also found higher levels of depression in children who were exposed to DFV. Their study identified DFV exposure in children under 4 years of age and followed them in five waves until the children were 15 years old. Previous longitudinal research undertaken by the authors of the current report (Orr, Fisher, Preen et al., 2020) found that Western Australian children aged 0 to 18 who were exposed to DFV before the age of 5 were three times more likely to be hospitalised during childhood for mental health disorders than non-exposed children. The mental health hospitalisations were predominately for mental and behavioural disorders due to acute stress reaction and adjustment disorders, the use of alcohol, major depressive disorder, and mental and behavioural disorders due to the use of volatile solvents.

The majority of the available literature investigating the impact of DFV on children's mental health groups the behaviours into two distinct categories: internalising and externalising behaviours. Internalising behaviours include depression, somatic or physiological complaints, anxiety, withdrawal, suicidal ideations, eating disorders and phobias. Externalising refers to the outward expression of harmful behaviours such as aggression, hyperactivity and disobedience that affect the external environment. A meta-analysis of 60, mainly cross-sectional, studies by Evans and colleagues (2008) found an association between DFV exposure and an increased likelihood of both internalising and externalising behaviours. A more recent meta-analysis of 74 qualitative studies by Vu and colleagues (2016) also reported an increased likelihood of internalising and externalising behaviours in children exposed to DFV. However, their study went further and investigated the long-term impact of exposure to DFV on children. They found that the association of DFV exposure and internalising and externalising problems increased over time. The authors highlight that children newly exposed to DFV may display no internalising or externalising behaviours and be thought of as being "resilient" after the exposure. However, they suggest that there may be a "sleeping effect" and the true impact on the child may not manifest for many years after the exposure.

Kernic and colleagues (2003) carried out a study with children (n=167) aged 2 to 17 in the United States whose mothers

had been identified in police or court records as being subjected to DFV. They used Achenbach's Child Behavior Checklist (Achenbach, 1991) to investigate the internalising and externalising behaviours of children exposed to DFV compared to a standardised normative sample (n=2,736) representative of the United States population. They reported that children exposed to DFV had a 60 per cent increase in risk of externalising behaviour compared to the standardised sample. However, they reported a non-significant increase for internalising behaviours compared to the standardised sample. Similarly, Campbell and colleagues' (2013) retrospective cohort study of children with a recent child protection services investigation and DFV in the preceding 12 months found no significantly increased risk of internalising problems in the children exposed to DFV. However, they reported an 88 per cent increase in risk of externalising behaviours in children exposed to DFV six years after their recruitment in the study. The studies by Kernic et al. (2003) and Campbell et al. (2013) relied on parental reporting of children's issues, like much of the literature investigating this area. However, the internalising problems may not be visible to the parents. A recent study (Orr et al., 2021) from the current report's authors overcame the parental reporting issue by using linked administrative data to investigate the early development of children exposed to DFV. The study used Australian Early Development Census (AEDC) data (AEDC, 2022) which contains teacher reporting of children's early development vulnerability. It was found that young children exposed to DFV were more likely to exhibit internalising behaviours including anxious and fearful behaviour, emotional problems and worrying compared to their non-exposed counterparts.

Olofsson and colleagues' (2011) study (n=4,947) using data drawn from the *Swedish National Health Survey* reported that children (aged 0 to 18) exposed to DFV had higher odds of anxiety than non-exposed children. While the odds were significant for both male and female children, differences were apparent between the sexes: girls exposed to DFV had a six-fold increase in odds of anxiety whereas exposed boys had between a two-fold and three-fold increase, depending on their age. It has been postulated that the outcomes for girls may differ as they may be experiencing co-occurring forms of victimisation which have not been taken into account (du Plessis et al., 2015; Seng et al., 2005). These co-occurring abuses can include sexual and physical abuse

(Campo, 2015). Moylan and colleagues' (2010) prospective longitudinal study in the United States found that pre-school children exposed to DFV had higher levels of internalising and externalising behaviours than non-exposed children. They also reported finding sex differences, with females scoring higher on internalising behaviours, and males higher on externalising behaviours. Moylan et al.'s (2010) study is not alone in finding differences between the sexes: several studies have reported that children exposed to DFV can exhibit different behavioural problems with males more likely to demonstrate externalising behaviours and females more likely to demonstrate internalising behaviours (e.g. du Plessis et al., 2015; Hosokawa & Katsura, 2019; Izaguirre & Calvete, 2018). However, Holmes and colleagues' (2015) longitudinal study of children (n=1,125) drawn from a national survey of child and adolescent wellbeing in the United States found that among children exposed to DFV, girls were at greater risk of externalising problems than boys. Holmes and colleagues' findings are not unique, with other researchers reporting higher rates of externalising in girls exposed to DFV than boys exposed to DFV (e.g. Bair-Merritt et al., 2015). Indeed, the evidence of sex is equivocal with other studies suggesting no difference or that the difference is a trend that can change with age (Sternberg et al., 2006; Vu et al., 2016).

Exposure to DFV is recognised as a precursor to post-traumatic stress disorder (PTSD) for some children (Boeckel et al., 2017; Margolin & Vickerman, 2007). The stressor criterion for PTSD in the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition; DSM-5; American Psychiatric Association, 2013) states that a person must have experienced or witnessed a traumatic event, or learned that the traumatic event occurred to a close family member. The DSM-5 stressor criterion for PTSD describes experiences commonly reported in relation to children's exposure to DFV. Concerns have been raised (Margolin & Vickerman, 2007) that PTSD in children exposed to DFV may be misdiagnosed as another childhood condition, such as hyperactivity, depression or anxiety, due to the fact that psychological health assessments may be made without knowledge of the traumatic incident(s), namely DFV.

While PTSD is included in the DSM-5 as a diagnosable condition, growing research into the effects of trauma on

child development has expanded, leading to growing calls from psychologists to include developmental trauma as a diagnostic condition (Abrams, 2021). The lack of inclusion of developmental trauma in current classifications has been argued to result in a lack of either diagnosis or assistance through mental health services. It can also result in misdiagnosis such as attention deficit disorder resulting in treatments more likely to be behavioural and medical interventions rather than trauma-focused therapies.

Burden of mental illness in children

It is estimated that one in seven Australian children aged 4 to 17 (Goodsell et al., 2017) and almost one in four Aboriginal children aged 5 to 10 (Shepherd et al., 2017) have a mental health disorder. Mental health disorders are a leading cause of disease burden in children (AIHW, 2020a). The *Young Minds Matter Survey*, the latest survey of child and adolescent wellbeing in Australia (Lawrence et al., 2015), reported that 43 per cent of children with a depressive disorder had severe impairment of daily living functioning. This impairment has been highlighted by Lawrence and colleagues (2019) who found that children with mental health disorders are more likely to have poor school attendance compared to their peers. Regular attendance at school is acknowledged as a crucial component of engagement in schooling and a key prerequisite for academic success (Hancock et al., 2017). Furthermore, it is accepted that mental illness in childhood is associated with a range of poor longitudinal outcomes such as mental illness in adulthood, including mood and anxiety disorders (Nock et al., 2007; Reef et al., 2010) and substance abuse (Fergusson et al., 2007; Nock et al., 2007). Additionally, research has highlighted that mental health disorders in childhood increase the likelihood of criminal offending in adulthood (Anderson et al., 2015).

At a societal level, the economic burden of mental health disorders is substantial. Around \$10.6 billion was spent on mental health services in 2018–19 (AIHW, 2021a). Child and adolescent mental health services are costly, with an average of \$2,366 per patient per day (AIHW, 2021a).

Sociodemographic characteristics

Maternal mental health

It is acknowledged that women who are subjected to DFV are more likely to have mental illness than those not subjected to DFV (Karakurt et al., 2014; Langdon et al., 2014; Vilariño et al., 2018). A substantial body of evidence suggests that maternal mental illness negatively impacts children's mental health (Barker et al., 2011; Korhonen et al., 2012; Leis et al., 2014). It is thought that maternal mental illness can impact parenting capacity (Royal Australian and New Zealand College of Psychiatrists [RANZCP], 2016; Smith, 2004); however, it has been acknowledged that the impact will vary by type of mental illness, its duration and its severity (AIHW, 2020a; Reupert et al., 2012). Maternal mental health plays a key role in children's outcomes: in addition to the challenges surrounding parental mental illness, children exposed to parental mental illness are more likely to experience adversities compared with their non-exposed counterparts (Abel et al., 2019). It has been acknowledged that evidence-based early intervention for maternal mental illness can improve mental health outcomes for children (RANZCP, 2016).

Disability

While the effects of DFV on children's outcomes are starting to become clearer, the effects on children with disability remain poorly understood (Dababnah et al., 2018; Robinson et al., 2020). Within Australia, 8 per cent of children under 15 years have disability (ABS, 2019). The greater dependency of children with disability on carers and family support and the time spent in the family home are thought to place the child at greater risk of DFV exposure (Baldry et al., 2006). The association between DFV exposure and intellectual disability is complex. Children exposed to DFV in utero are more likely to be born early and with a low birth weight, both of which increase the risk of intellectual disability (Bailey, 2010; Dababnah et al., 2018). Additionally, being subjected to DFV in pregnancy has been correlated with congenital malformations (Hansen et al., 2000; Orr et al., 2022; Ortega-García et al., 2013). Exposure to DFV in utero has also been associated with lower IQ scores in children (Huth-Bocks et al., 2001; Koenen et al., 2003; Ybarra et al., 2007), poorer cognitive ability (Orr et al., 2021; Udo et al., 2016) and developmental delays (Dababnah et al., 2018; Udo et al., 2016).

Culturally and linguistically diverse status

Australia has a long history of migration (Collins, 2013). The most recent Australian Census (ABS, 2021a) reported that 62 per cent of Western Australians have one or both parents born overseas. The evidence as to whether prevalence of DFV is higher or lower in CALD women compared to Australian-born women is equivocal (Cox, 2015; Ghafournia & Easteal, 2018). CALD women's experiences of DFV are often exacerbated through the intersectional nature of forms of oppression, such as racism; changed and changing gender and family roles (Fisher, 2013); and social factors including social isolation (Carline & Easteal, 2014) and lack of awareness of available services (Ghafournia & Easteal, 2018). Concurrently, evidence is lacking on the outcomes of children who are exposed to DFV and born to CALD parents. This may be due to those from CALD backgrounds not being identified in samples or underrepresented within research.

The most recent *Young Minds Matter Survey* (Lawrence et al., 2015) in Australia reported mental illness to be less common in children with both carers born overseas (5%) than those with both carers born in Australia (14%). However, findings in this area are equivocal with Minas and colleagues (2013) reporting similar levels of mental illness in children of migrant parents and children of Australian-born parents.

Child maltreatment

Children exposed to DFV are at increased risk for child maltreatment (Herrenkhol et al., 2008; Orr, Fisher et al., 2019), with a concomitant three-fold increased risk of poorer mental health outcomes than their non-abused peers (Maclean et al., 2019). Child maltreatment is generally considered to be behaviour towards a child which has a risk of causing physical or emotional harm from physical abuse, sexual abuse, emotional abuse and/or neglect (Australian Institute of Family Studies [AIFS], 2018), with maltreatment significantly contributing to child mortality and morbidity (Chen et al., 2016; Gilbert et al., 2009; Segal et al., 2021). Chronic stress from the trauma is thought to impact the child's brain which can result in health problems (National Scientific Council on the Developing Child, 2012). In recent years children's exposure to DFV has been acknowledged as a type of maltreatment (AIFS, 2018; Graham-Bermann, 2011; Richards, 2011). However, differences exist between state and

federal definitions within Australia. The Commonwealth *Family Law Act 1975* recognises that exposure to DFV is a form of child abuse – specifically, psychological harm. The Act defines exposure as occurring “if the child sees or hears family violence or otherwise experiences the effects of family violence” (pt I, s 4AB). The Western Australian *Children and Community Services Act 2004* widened its definition of emotional abuse, in 2016, to include children’s exposure to DFV. They use the definition from the *Restraining Orders Act 1997* (WA). Exposure in this context is defined by the child seeing or hearing the DFV or witnessing physical injuries resulting from DFV. Historically, mothers subjected to DFV have been blamed for not maintaining the safety of their children. However, this is rightfully changing with a growing focus on perpetrator accountability including the development of policies and practice in child protection on how to respond to DFV (e.g. Government of Western Australia, 2015).

While it is widely cited that there is a considerable overlap between DFV and other types of child maltreatment (e.g. Gracia et al., 2018; Herrenkohl et al., 2008), the extent of this overlap varies significantly in the literature. This may be due in part to robust estimates of any association being difficult to confirm due to the variability in the definitions of child maltreatment, DFV and exposure within the literature. That being said, from a review of 10 studies presenting prevalence of the co-occurrence of DFV with other forms of child maltreatment, Bidarra and colleagues (2016) estimated the prevalence to be between 12 per cent and 70 per cent. Previous research (Orr, Fisher et al., 2019) on Western Australian children (n=524,534) born in a 20-year period found that 41 per cent of children whose mothers were hospitalised for DFV were known to child protection services. Given the high level of overlap among types of maltreatment and links to multiple poor outcomes (e.g. Maclean, Taylor et al., 2017; Mills et al., 2012) it is difficult to isolate to the effect of a single maltreatment type on a specific outcome.

Socioeconomic status

Despite DFV occurring across all economic strata, low socioeconomic status (SES) has been acknowledged as a risk factor for women subjected to DFV (Orr, Preen et al., 2019; Orr, Fisher, Preen et al., 2020; Reichel, 2017). Low SES is also

associated with mental health disorders in childhood, with the most recent national survey of Australian children and young people reporting higher prevalence of mental health disorders in children from low SES than in those residing in higher SES areas (Lawrence et al., 2015).

Aboriginal and Torres Strait Islander children

Based on data from the 2014–15 National Aboriginal and Torres Strait Islander Social Survey (ABS, 2016b), Aboriginal and Torres Strait Islander women experience high rates of DFV. As a result, Aboriginal and Torres Strait Islander children may be more likely to live in homes where violence is present than non-Aboriginal and Torres Strait Islander children. The *National Plan to Reduce Violence against Women and their Children 2010–2022* (Council of Australian Governments, 2011) acknowledges the disproportionate rates of DFV and children’s exposure to it as a national priority.

Research indicates that Aboriginal and Torres Strait Islander children are more likely to have poorer mental health than their non-Aboriginal and Torres Strait Islander peers (AIHW, 2018c; Al-Yaman, 2017). The disparity in mental health is the result of cultural genocide, colonisation and racism (Calma et al., 2017; Marmot, 2011; Shepherd et al., 2017). The mental health of Aboriginal and Torres Strait Islander children is a priority in the national agreement between the Australian Government and the Coalition of Aboriginal and Torres Strait Islander Peak Organisations in their commitment to “close the gap” (Commonwealth of Australia. Department of the Prime Minister and Cabinet, 2021) between the outcomes for Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander children. Research specific to Aboriginal and Torres Strait Islander children’s experiences of DFV and mental illness is lacking, and it is an area in need of investigation.

Resilience

It is important to note that not all children exposed to DFV will have negative outcomes. Some children who experience adverse events in childhood adapt well and show no maladjustment in their psychological development (Masten, 2001). Children who do not develop negative outcomes and adapt successfully when exposed to adverse circumstances are considered

resilient (Howell, 2011). Resilience is a dynamic construct, changing in response to external and internal events and conditions (Herrman et al., 2011; Masten, 2011). It has been described as an individual's adaptation to manage or cope with significant adversity, risk or stress, which may result in an increased capacity to respond to future adversity (Herrman et al., 2011; Lemerle & Stewart, 2011; Luthar et al., 2000). It is widely accepted that resilience is not only derived from individual personal characteristics but also from external circumstances such as social and cultural determinants (Cicchetti & Valentino, 2006; Study of Environment on Aboriginal Resilience and Child Health Investigators, 2010). The socio-ecological model (Bronfenbrenner, 1977) has been used in this report to identify factors across internal and external systems that influence resilience (Henderson et al., 2016; Howell, 2011). However, as highlighted earlier in this section there may be a "sleeper effect" and the true impact on the child may not manifest for many years after the exposure (Vu et al., 2016).

Using linked administrative data for research on children exposed to DFV

Much use has already been made of the large linked administrative databases in Western Australia to investigate outcomes of children's adverse childhood experiences, including maltreatment and incarcerated parents (e.g. Bell et al., 2018; Hafekost et al., 2017; Maclean et al., 2020). However, the use of linked administrative data to investigate the impact of DFV on children is emerging. Linked administrative datasets provide numerous research benefits. Firstly, such data are based on the whole population which reduces selection biases that are present in most DFV exposure research, such as small samples drawn from refuges and other specialist services. Specialist services are often used for sampling for a plethora of reasons including difficulty in identifying children exposed to DFV, maintaining the safety of the child and their family, and ensuring that the children have appropriate mental health support when recalling their experiences (Btoush & Campbell, 2003; Fraga, 2016; Paavilainen et al., 2014). Utilising linked administrative data overcomes many of these issues. Furthermore, we are able to investigate important groups such as Aboriginal and Torres Strait Islander children and children with disability

utilising administrative data because, as noted, it includes the whole population. Linked administrative data also provides access to important factors that can impact on the outcomes of children and be adjusted for in analysis, such as SES, mother's marital status and mother's mental health.

Conclusion

Exposure to DFV is a significant stressor for Australian children. Existing literature highlights that exposure to DFV is associated with poorer mental health in childhood. However, the literature is limited by the predominant use of cross-sectional studies with little account given to the mental health impacts that may occur over time. Existing research has also focused on the grouping of mental health issues into internalising and externalising behaviours which can restrict targeted interventions. Additionally, there is a need to conduct research in an Australian context given the disparity of both exposure to DFV and mental illness for Aboriginal and Torres Strait Islander children. Children exposed to DFV may not present with mental illness for many years. The use of longitudinal linked administrative data provides a clearer understanding of the long-term impact of DFV exposure on children's mental health and takes into account factors that are likely to co-occur with DFV exposure that will also impact their mental health. The lack of available evidence to inform best-practice principles for interventions for children exposed to DFV means that current interventions may be sub-optimal, or even inappropriate. This project provides an opportunity to identify areas for targeted and evidence-based interventions and policies by utilising the best possible data.

Methods

The objective of this study was to explore the mental health service use of, and mental health diagnosis associated with, children exposed to DFV. This was achieved via a population-based cohort study using de-identified linked administrative data of children born in Western Australia between 1987 and 2010. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting checklist (von Elm et al., 2008) was used to guide this report.

Conceptual framework

In acknowledgement of the disproportionate levels of violence against women perpetrated by men this study was underpinned by feminist theory (Dobash & Dobash, 1979; Yodanis, 2004). Additionally, a socio-ecological model (see for example Heise, 1998) was adopted as the conceptual framework for this study. Ecological models were introduced in the 1970s by Bronfenbrenner (1977) to explain how the interactive environment affects a child's growth and development. It was argued that human development is the product of bi-directional interactions (processes) between an individual (person) and the many developmental settings (context) to which the individual is exposed over the life course (time; Bronfenbrenner, 1994). The socio-ecological model has also been used to integrate the array of personal, situational and social factors that interact to gain understandings of DFV (Heise, 1998), with the WHO adopting Heise's ecological model in their work on DFV (WHO, 2020b). The model is appropriate for the current study as children exposed to DFV are more likely to live with multiple stressors (McGavock & Spratt, 2017) and an ecological framework is a useful approach to consider the complex variables that influence a child's mental health (D'Andrea & Graham-Bermann, 2017). The model is also able to incorporate both feminist and social science insights.

Data sources

An overview of the data collections and the main variables extracted for the research presented in this report are shown in Table 2.

Mental Health Information System

The MHIS has been collecting information since 1966 and includes all records of patients using inpatient and outpatient public mental health services and private inpatient services. Inpatient data are collected from mental health hospital wards and community accommodation support programs. Outpatient information is collected from psychiatric clinics, triage services, community mental health centres, psychiatric day centres and rehabilitation programs. Clinical data that are collected include principal diagnosis, start and end date of the mental illness episode, and the date that the individual utilised mental health services. The diagnosis is coded using ICD codes. The MHIS data also includes demographic details (e.g. age, sex).

Hospital Morbidity Data Collection

The HMDC is a database of information about hospital admissions. It includes summaries of all admission records for both public and private hospital inpatients. Records are structured on a patient's episode of care, with each record containing information regarding an admission and clinical procedures carried out, discharge and separation from hospital, and demographic information. The diagnosis information includes one principal diagnosis, up to four co-diagnoses, and up to 20 additional diagnoses. The record also contains external cause of injury codes. This information can include place of event and circumstances of the injury. The HMDC has been in operation since 1970 and in that time it has utilised several editions of ICD codes. The ICD-8 was utilised between 1970 and December 1978; the ICD-9 was used between January 1979 and December 1987; the ICD-9-Clinical Modification (ICD-9-CM) was used between January 1988 and June 1999; and the ICD-10-Australian Modification (ICD-10-AM) has been used from July 1999 until the present date.

Emergency Department Data Collection

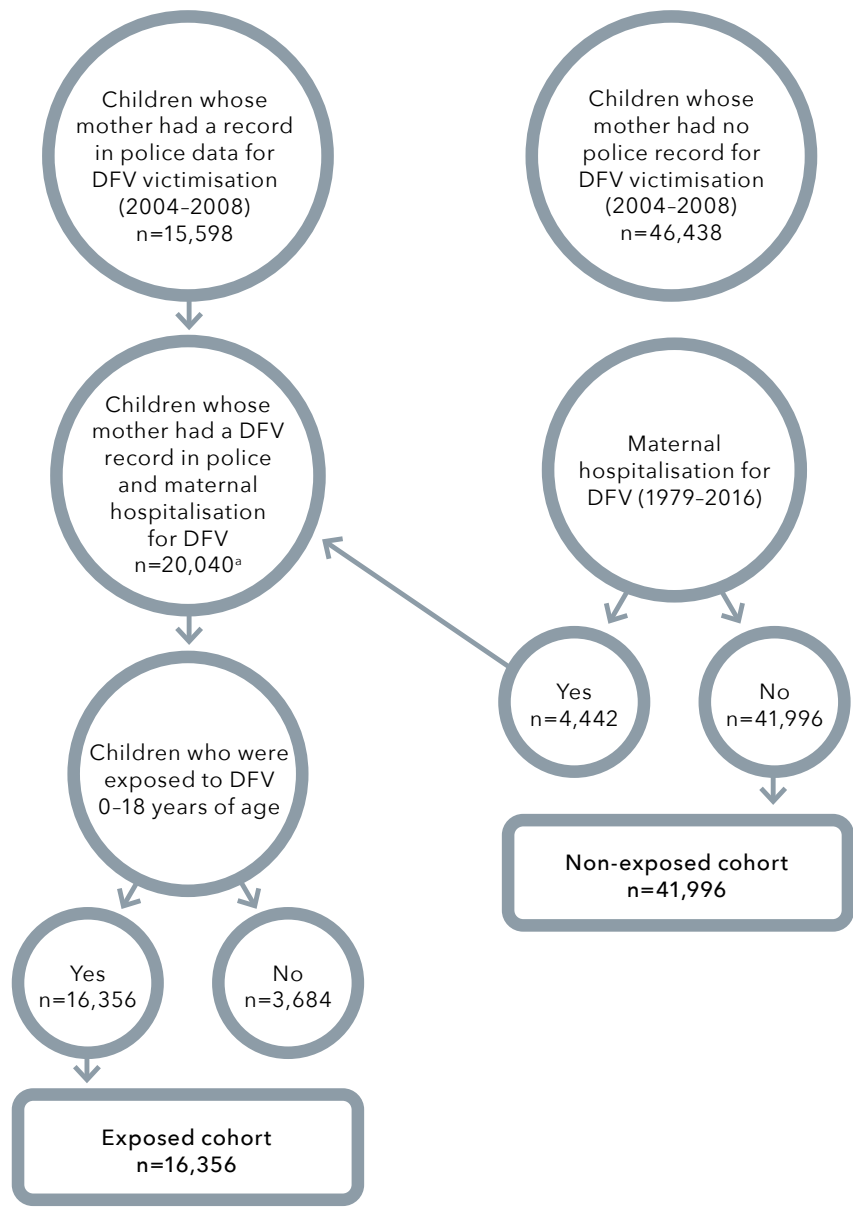
The EDDC includes information on all presentations to emergency departments of public hospitals in Western Australia, as well as emergency department activity in private hospitals under contract with the Western Australian Government. Records in this collection date back to 2002. Information recorded includes primary diagnosis (when applicable), coded per ICD-10-AM, and demographic

Table 2: Data collection variables and periods of coverage used in this report

Dataset	Period of coverage contained in this report	Main variables extracted
WA Registry of Births, Deaths and Marriages	1987–2010	Date of birth (mm/yyyy) Sex Gestation Born in hospital Mother's age Birth weight
Midwives Notification System	1987–2010	Date of birth (mm/yyyy) Sex Maternal age Maternal marital status Mother's previous pregnancies Gestation ARIA ^a SEIFA ^b
Hospital Morbidity Data Collection (HMDC)	1970–2016	Admission date Separation date Age at admission Principal diagnosis External cause codes Additional diagnosis
Emergency Department Data Collection (EDDC)	2002–2016	Presentation date (mm/yyyy) Principal diagnosis External cause of injury code
Mental Health Information System (MHIS)	1970–2017	Primary diagnosis Date of birth (mm/yyyy) Age at contact Episode start date Date of contact
Department of Communities, Child Protection and Family Support (CPFS) dataset	1990–2016	Reason type Reason start date Reason end date Primary nature of concern Period of care start date Period of care end date
Western Australian Register of Developmental Anomalies (WARDA)	1987–2016	Diagnosis code Major or minor malformation Sex
Intellectual Disability Exploring Answers (IDEA) dataset	1987–2016	Level of intellectual disability Date of birth (mm/yyyy) Type of disability
Western Australia Police Force Incident Management System (IMS)	2004–2008	Offence Partner type Children present Location of offence

Notes: ^a Accessibility/Remoteness Index of Australia.^b Socioeconomic Indexes for Areas.

Figure 1: Cohort selection flowchart



Note: ^a Includes the 4,442 children identified in the original cohort of children whose mother had no police record for DFV victimisation (2004-2008) but had a maternal hospitalisation for DFV.

information including date of birth, sex, Aboriginal and Torres Strait Islander status and country of birth.

Cohort selection

Exposure to DFV was initially identified in children born between 1987 and 2010 (inclusive) whose mother was identified in Western Australia Police Force IMS data from 2004 to the end of 2008 as a victim of DFV where a male perpetrator was charged for the offence and a domestic relationship indicator was recorded. This approach has been used in previous research (Orr, Fisher, Preen et al., 2020; Orr, Fisher, Glauert et al., 2020). The criminal offences included were murder, attempted murder, assault and injury, sexual assault, threatening behaviour and misuse of weapons/explosives. There were 15,598 children born to mothers

who were identified as victims of DFV in police data during the period 2004 to 2008 (inclusive). Children were initially individually matched at a ratio of 1:3 (15,598:46,438) to a non-DFV (i.e. non-exposed) cohort of children based on month of birth, SES, Aboriginal and Torres Strait Islander status and sex. Due to the hidden nature of DFV (Francis et al., 2017) we also examined non-exposed children for any maternal DFV hospitalisations by interrogating the hospital records of their mothers from 1979 to 2016 (inclusive) using ICD codes used in previous research (Orr, Preen et al., 2019; Orr, Fisher, Preen et al., 2020). We found that 4,442 originally “non-exposed” children had a mother who was hospitalised for DFV-related injuries. Finally, we identified children in the exposed group who were exposed to DFV between birth and 18 years. This resulted in an exposed cohort of 16,356 and a non-exposed cohort of 41,996 children (Figure 1).

Data linkage

Data linkage is defined as “the bringing together[,] from two or more different sources, data that relate to the same individual, family, place or event” (Holman et al., 2008, p. 767). Data linkage involves the linkage of administrative (and other) data that are collected by governments and non-government agencies for service delivery and administrative purposes. These data are commonly collected at the population level, can be made available for research and contain rich, detailed information. The linking of data sets from multiple sources can provide greater insights than those generated by single sources (Harron et al., 2017). While population-level administrative data do not capture the level of detail that may be sourced from survey data, linked individual-level administrative data has become an attractive alternative as it provides longitudinal information; is free of biases which typically affect survey data such as recall, response and selection biases, and attrition; and it is comparatively cost-effective as the data are already collected (Jutte et al., 2011; Pearson, 2015). Linked administrative data can provide large sample sizes and detailed data on hard-to-reach populations, such as children exposed to DFV, enabling evidence to be generated with a high level of external validity and applicability for policymaking (Harron et al., 2017).

Data custodians are the gatekeepers of administrative datasets and have a number of rights and responsibilities in relation to the release and access of datasets by researchers (Australian Government, 2018), including ensuring that the research project is of public benefit.

Datasets were linked, for both exposed and non-exposed groups, by the Western Australian Data Linkage Branch using probabilistic linkage (Holman et al., 1999). Data were provided as individual linkable datasets to the report authors, then de-identified and merged using a project-specific encrypted linkage key (Kelman et al., 2002). No identifiable information was received by the researchers involved in this study.

The Western Australia Police Force provided data from their IMS to the Western Australian Data Linkage Branch for women who had been subjected to DFV that resulted in the male perpetrator being charged with an offence. The children

of the females subjected to DFV were linked by the Data Linkage Branch using the WA Midwives Notification System.

WA Family Connections System

The WA Family Connections System contains links between individuals who are related, created using information from datasets that identify multiple related people, for example Birth Registrations and Midwives' Notifications (Glasson et al., 2008). These relationships are usually biological. No information is known about adoptions, including step, local or overseas adoptions; other care arrangements; or divorces. The genealogy held by the Data Linkage Branch includes parents and siblings of people born in Western Australia since 1945. Extended family members (including grandparents, grandchildren, cousins, aunts and uncles) can also be identified (Government of Western Australia Department of Health, 2022). Links are available for people born in Western Australia and their family members who have migrated to Western Australia and had contact with one of the government agencies listed in Table 2. To connect the family members the researchers were provided with a separate mapping file that include a “linkage key” for the child matched to a corresponding linkage key for the family member. For this study linkage keys were provided to connect a child with their mother and their father across datasets.

Consent

Administrative data in Western Australia are collected without consent. To ensure confidentiality and ethical practice, strict processes exist for access to linked administrative data. To gain access to data, researchers must adhere to the Data Linkage Branch's Access and Charging Policy. Researchers are required to discuss potential projects with the data custodian of each database from which they are requesting data and gain their approval to access the data. Aboriginal data sovereignty

affirms the rights of Indigenous peoples to determine the means of collection, access, analysis, interpretation, management, dissemination and re-use of data pertaining to the Indigenous peoples from whom it has been derived, or to whom it relates. (Walter et al., 2021, p. 4)

Table 3: ICD codes identifying DFV

ICD code	Definition	ICD edition
E960–E969	Homicide and injury purposely inflicted by other persons	ICD-9 ^a
995.81	Adult physical abuse	ICD-9 ^a
V71.5	Observation following alleged rape or seduction	ICD-9 ^a
E980–E989	Injury undetermined whether accidentally or purposely inflicted	ICD-9 ^a
V61.1	Counselling for marital and partner problems	ICD-9 ^a
T74.1	Physical abuse	ICD-10-AM ^b
T74.2	Sexual abuse	ICD-10-AM ^b
T74.3	Psychological abuse	ICD-10-AM ^b
Z04.4	Examination and observation following alleged rape or seduction Examination of victim or culprit following alleged rape or seduction	ICD-10-AM ^b
X85–Y09	Assault	ICD-10-AM ^b
Y10–Y34	Event of undetermined intent	ICD-10-AM ^b
Z63.0	Problems in relationship with spouse or partner. Discord between partners resulting in severe or prolonged loss of control, in generalisation of hostile or critical feelings or in a persisting atmosphere of severe interpersonal violence (hitting or striking)	ICD-10-AM ^b

Notes: ^a International Classification of Diseases Ninth Edition.

^b International Classifications of Disease 10th Edition Australian Modification.

This project engaged with Aboriginal people and Aboriginal community-controlled organisations (see “Community and consumer involvement” subsection for further detail) about the design and interpretation of the data. Additionally, approval was gained from the Western Australian Aboriginal Health Ethics Committee (WAAHEC), with WAAHEC reviewing the report prior to publication. WAAHEC monitors outputs to ensure that they are ethically sound and culturally appropriate, as well as to ensure benefit to Aboriginal and Torres Strait Islander peoples.

Cohort characteristics

Domestic and family violence exposure

Western Australia Police Force data have a mandatory “domestic flag” variable which has been recorded since the implementation of the Frontline IMS system in 2004. This variable draws on the type of behaviour alleged and the relationship between the parties.

The type of DFV is indicated in police data by the Australian and New Zealand Standard Offence Classification (ABS, 2011a)

subdivision level. The DFV types are murder and attempted murder, assault and injury, sexual assault, threatening behaviour, and misuse of weapons/explosives (see Appendix A for further details). The data from IMS made available to the researchers were from 1 January 2004 to 31 December 2008.

HMDC records do not contain a “DFV flag”. Therefore, records of the mothers were searched for ICD codes used in previous studies (Orr, Preen et al., 2019; Orr, Fisher, Preen et al., 2020) that identify DFV (Table 3).

The project is based on the assumption that children in the majority reside with their mother as primary caregiver.

Aboriginal and Torres Strait Islander status

Aboriginal and Torres Strait Islander children were identified by the Western Australian Data Linkage Branch derived Aboriginal status flag. The flag, developed by the Data Linkage Branch in collaboration with the Australian Institute of Health and Welfare (AIHW), is derived by a validated algorithm when an individual is recorded as Aboriginal and/or Torres Strait Islander in Western Australian Government administrative data sets (Christensen et al., 2014).

Table 4: ICD codes capturing disability

Disability description	ICD-9	ICD-10
Intellectual disability	317-319	F70-F79
Autism	299.0	F84.0, F84.1
Down syndrome	758.0	Q90
Cerebral palsy	343	G80
Birth defects	740-759 (excluding 758.0) 243, 246.1, 255.2, 270, 271.3, 272.4, 271.0, 271.1, 271.2, 272.3, 271.8, 272.7, 330.1, 277.5, 271.8, 271.9, 272.7, 277.2, 277.1, 277.4, 277.8, 275.1, 275.3, 275.4, 277, 272.6, 277.6, 277.8, 330.2, 330.4, 330.8, 331.9, 359.0, 359.1, 359.2	Q00-Q99 (excluding Q90) E03.0, E03.1, E25.0, E25.9, E70-E73.0, E74.0-E74.4, E75, E76, E77, E79.1, E79.8, E79.9, E80.0-E80.5, E83.0, E83.3, E83.5, E84, E88.0, E88.1, E88.8, G31.8, G31.9, G32.8, G71

Disability

Disability was flagged from three sources: first, a record of the child in WARDA datasets as having a birth defect or cerebral palsy, and second, intellectual disability captured in the IDEA database. Third, following consultation with advisors from WARDA, ICD codes were identified (Table 4) that were used to search the child's HMDC records to further capture disability.

Culturally and linguistically diverse children

We aimed to investigate the mental health service contact and mental health diagnosis by subtypes of CALD children who were exposed to DFV compared with non-CALD children exposed to DFV. However, this was unable to be empirically examined due to limitations in the data.

Socioeconomic status

Neighbourhood-level SES was determined by the Socio-Economic Indexes for Areas (SEIFA) using the Midwives Notification System. The SEIFA score is based on information from the Australian Census about income, education, employment, occupation and housing, and provides a measure of relative SES for the area where a person resides. Five levels of disadvantage were assigned to Census collection districts (~250 households), ranging from 1 (high disadvantage) to 5 (low disadvantage; ABS, 2018a).

Residential remoteness

Residential remoteness was determined by the Accessibility/Remoteness Index of Australia (ARIA), based on the distance of geographic locations from the nearest population centre, ranging from major cities to very remote Australia (ABS,

2018b). Residential remoteness was identified in the Midwives Notification System from collection district, with the smallest spatial unit available equating to approximately 250 households (ABS, 2011b).

Mothers' mental health service contact

Mothers' mental health service contact was identified if the mother had a record in the MHIS dataset, which included both public and private inpatient services and public outpatient services for psychiatric care. HMDC records were also searched for mental health admissions. Mothers' mental health contacts occurring after a child's first mental health contact were excluded from analysis.

Maternal marital status

Mothers' marital status was identified in the Midwives Notification System. They were grouped into four categories: married/de facto/widowed, never married, divorced/separated and unknown/not stated.

Parents' age

Mothers' age at the child's birth was identified in the Midwives Notification System and grouped into four categories: under 20 years, 20–29 years, 30–39 years and 40 years and over. Fathers' age details were also identified in the Midwives Notification System and groups using the same categories as above. Not all children had their father's age available so a fifth category of "missing age" was added.

Early gestation

Early gestation was identified in the Midwives Notification System. A child born prior to 37 weeks gestation was classified as being born pre-term.

Child protection involvement

Child protection involvement was identified in the Western Australia Department of Communities dataset where a notification had been made regarding concern for the child. A child was deemed to have been in contact with child protection services if they had ever had at least one record of notification, period of care, order, placement or application within the child protection and family support data sets. Child protection involvement was moderately correlated with DFV (> 0.6), which can make it difficult to separate the effects of each risk factor. Using variance inflation factors (VIF) to test for collinearity, child protection involvement and DFV had $VIF=1.82$, meaning no evidence of collinearity. However, as DFV is a recognised form of child abuse (Richards, 2011), child protection was excluded in analysis due to the conceptual similarities and the challenge of disentangling the effect (Richards, 2011).

Outcomes

The primary study outcomes were childhood mental health service contact and mental illness diagnosis. Children were followed from birth until end of follow-up on 31 December 2017, date of death or the age of 18, whichever came first. Outcomes were examined in the cohort overall and separately in Aboriginal and Torres Strait Islander children and children with disability.

Mental health service use was ascertained by combining records of mental health contacts/discharges and diagnoses across the HMDC, MHIS and EDDC data collections. The primary diagnosis code in HMDC is mandatory; HMDC records used in this study had fully populated primary diagnosis. Population of diagnosis in EDDC is not mandatory, and 68.5 per cent of EDDC records used in this study had principal diagnosis missing. MHIS data had 39.7 per cent of records missing a primary diagnosis. The overall measure of mental health service contact was defined as a child having

had any mental illness-related diagnosis (yes/no) in HMDC or EDDC data and/or any recorded contact in MHIS during the follow-up period. Only a child's first mental illness-related contact after DFV (across the three data collections) was considered for modelling purposes relating to overall service contact.

Mental health diagnosis was captured by utilising ICD codes to identify diagnostic outcomes. These diagnoses were grouped according to mental health types. Mental health diagnoses were categorised into 10 main groupings (Table 5). Self-harm was included in mental health service contact and diagnosis grouping: while self-harm is not a mental illness it is often linked to mental distress. The inclusion of self-harm in mental health service contact is an approach used in previous research (Maclean et al., 2019). It is important to note that children with more than one diagnosis during childhood could be counted in multiple diagnostic groups.

Community and consumer involvement

Community and consumer consultation

Prior to the initiation of the project, members of the research team undertook a research priority setting process through a partnership with those with lived experience of DFV, their informal support people and DFV service providers. This priority setting process highlighted that the impact of DFV on children was a priority area for research (Fisher et al., 2016). The researchers also met with the Developmental Pathway Project Community and Consumer Group at the Telethon Kids Institute to gain feedback and comment on the proposed research. Meetings were also held with the Kulunga Aboriginal Research Development Unit (KARDU) at the Telethon Kids Institute, which is involved with building the capacity and development of researchers working on research projects that include a focus on Aboriginal outcomes. Meetings were also held with Ruah Community Services, an organisation providing community DFV services. Additionally, discussions were held with senior staff at Aboriginal community-controlled health services within Western Australia. Support for the research was gained from the Wirraka Maya Health Service Aboriginal Corporation and Moorditj Koort Aboriginal Health and Wellness Centre.

Table 5: Mental illness-related ICD diagnostic codes

Mental illness group ^a	ICD-9 codes	ICD-10 codes
Organic disorder	290, 293, 294	F00–F09
Substance use disorder	292, 304, 305	F10–F19, F55
Schizophrenia and psychoses	295, 297, 298	F20–F29, F30, F31, F32, F33, F34.8, F34.9, F38, F39
Depressive disorder	296, 300.4, 311	F32.0, F32.9, F33.0, F34.1
Anxiety disorder	300, 300.0, 300.2, 300.3, 300.8, 308, 309	F40–F45, F48, F63.3, F68
Personality disorder	301	F60, F61, F62, F68, F69
Psychological development disorder	299, 307.2, 307.3, 307.6, 307.7 312, 313, 314, 315	F80–F89, F90–F98
Intentional self-harm	E950–E959	X60–X84
Other mental illness-related contacts	300.1, 300.5, 300.6, 300.7, 300.9, 302, 306, 307.0, 307.1, 307.4, 307.5, 307.8, 307.9, 310, 316	F44, F50–F54, F59, F64, F65, F66, F99
Mental health contact with no diagnosis recorded ^b	No mental illness-related ICD codes	No mental illness-related ICD codes

Notes: ^a Children with more than one diagnosis could be counted in multiple diagnostic groups.

^b Comprises children with a mental health contact in MHIS who had no mental health diagnosis and had no other mental health diagnosis identified in HMDC or EDDC data.

Post-initiation project support was provided by the Wungening Aboriginal Corporation to help facilitate a reference group to discuss and interpret report findings prior to publication.

Reference group

In addition to the community and consumer involvement outlined above, this project included three reference groups, the members of which provided feedback and advice on the interpretation of the research results and the implications of key findings for policy and practice. The first reference group was recruited by the WA Health Translation Network and comprised both Aboriginal and non-Aboriginal women with lived experience of DFV and/or mental illness. The second reference group comprised Aboriginal and Torres Strait Islander women with lived experience of DFV who were residing in a refuge service provided by Wungening Aboriginal Corporation. The third reference group was the Linking for Life community and consumer group, members of which have an understanding of using linked administrative data for research.

Statistical analysis

Descriptive analysis was conducted for all variables. Sociodemographic variable groupings were initially assessed for crude associations using Chi-square tests. Multivariate Cox regression was used to estimate the association between DFV and mental health service contact in children, with separate analyses for mental health sub-type groupings and by Aboriginal and Torres Strait Islander status and children with disability. Estimates are presented as adjusted and unadjusted hazard ratios (HR) with Wald 95 per cent confidence intervals (CI). Kaplan-Meier survivor function estimates for all categorical covariates were approximately parallel and hence each adhered to the proportional hazards assumption (Kleinbaum & Klein, 2012). Collinearity of covariates was tested using variance inflation factors where $VIF > 10$ was deemed to be collinear (Vittinghoff et al., 2012). No covariates considered for modelling were collinear based on these conditions. Models were adjusted for known sociodemographic confounders including sex, Aboriginal and Torres Strait Islander status, gestational period, SEIFA and ARIA. Parental sociodemographic factors were also included in the models as potential predictive variables, such as mother's age at birth, father's age at birth, marital

status and previous mental health service contact by the mother. Potential predictors known to increase the risk of the outcome were included. Each potential predictor was analysed separately to determine the univariate association with the outcome variable. Results in which the 95 per cent CIs did not include the null value of 1 were considered statistically significant. Time to first mental health-related contact was measured in months from birth. All models were tested for interactions, with no combinations showing significance at the $p < 0.05$ level.

A random assignment of virtual DFV exposure was applied to children not exposed to DFV matched by birth year to account for different cohort follow-up periods in children exposed to DFV and those not exposed. Non-exposed children assigned virtual times to mental health service contact that exceeded their total length of available follow-up were excluded from analysis ($n=815$).

The predicted number of mental health contacts was calculated to plot the trajectories of children exposed and not exposed to DFV according to different sociodemographic characteristics. Trajectories demonstrated time (in months) from first DFV (“time zero”) until first mental health service contact (or censored at death or once they had reached 18 years of age). All analyses were performed using Statistical Analysis System (SAS) statistical software (version 9.4) using the PHREG and LIFETEST procedures.

To investigate mental health service use over time we used trajectory plots to show the estimated cumulative probability (i.e. chance) of a child experiencing a mental health service contact over time (in years) from their birth until they reached 18 years of age. The trajectories are categorised according to those who had been exposed to DFV and those who were not exposed. These subgroups were further categorised according to a series of sociodemographic characteristics that are associated with higher risk of mental health contacts – specifically sex, SES, disability status and Aboriginal and Torres Strait Islander status. Cumulative probability curves were compared for differences using Gray’s test (Gray, 1988). A Gray’s p -value < 0.05 was considered a statistically significant difference.

To identify key sociodemographic characteristics of mental health diagnosis and diagnosis subtypes of children with known DFV we stratified our analysis by DFV exposure. Findings for non-exposed children allow comparison.

Research indicates that Aboriginal and Torres Strait Islander children are at an increased risk of exposure to DFV (ABS, 2016b) and mental illness compared to non-Aboriginal and Torres Strait Islander Australians (AIHW, 2018c). To gain an insight into the characteristics that increase the risk of mental health service contact for Aboriginal and Torres Strait Islander children we stratified our analysis by exposure to DFV. We also examined the risk of having a mental health diagnosis subtype for Aboriginal and Torres Strait Islander children exposed to DFV and Aboriginal and Torres Strait Islander children not exposed to DFV.

To gain an insight into the impact exposure to DFV has on Aboriginal and Torres Strait Islander children we examined the subcategories of mental health of exposed Aboriginal and Torres Strait Islander children compared to non-exposed Aboriginal and Torres Strait Islander children. We also investigated the subcategories of mental health for non-Aboriginal and Torres Strait Islander children exposed to DFV compared to non-exposed, non-Aboriginal and Torres Strait Islander children.

It is acknowledged that children with disability are more likely to have mental illness than children without disability (Emerson & Hatton, 2007; Hebron & Humphrey, 2014; Wadman et al., 2011). To gain an insight into the characteristics that increase the risk of mental health service contact for children with disability we stratified our analysis by disability status. We also examined the subcategories of mental health diagnosis of children with disability exposed to DFV compared to non-exposed children with disability.

Ethics

Ethics approval was gained from the Western Australian Department of Health Human Research Ethics Committee (#2016.60), the Western Australian Aboriginal Health Ethics Committee (#756) and The University of Western Australia Human Research Ethics Committee (RA/4/1/8867).

Results

Cohort sociodemographic characteristics

There were 58,352 children in our cohort, comprising 16,356 (28%) children who were exposed to DFV between birth and 18 years of age, and a non-DFV-exposed comparison group of 41,996 (72%) matched children. Table 6 highlights the characteristics of the children in the cohort.

Aboriginal and Torres Strait Islander children were over-represented in our cohort when compared to the state of Western Australia. According to the 2016 Census (ABS, 2018c), only 7 per cent of people under 18 years in Western Australia were Aboriginal and Torres Strait Islander, compared to 62 per cent of children in our exposed group and 50 per cent in our non-exposed group.

The exposed group also had a higher proportion of being born to teenage mothers (26% versus 15%) and unmarried mothers (31% versus 19%) and having a mother with a mental health disorder (45% versus 21%), compared to the non-exposed children. A higher proportion of children exposed to DFV were from a very remote area (21%) compared to non-exposed children (13%).

Over half of the children exposed to DFV were known to child protection services (53%). This proportion is considerably higher than the 4 per cent seen in the non-exposed group and higher than the national rate of 3 per cent reported by the AIHW (2021b).

A higher proportion of the exposed cohort had a mental health service contact compared to the non-exposed cohort (23% versus 11%).

There was a significant difference ($p < 0.0001$) between the average age of mental health contact for children exposed to DFV (12.5 years) compared to non-exposed children (11.6 years). The average age of DFV exposure in our exposed group was 6.5 years.

Risk of mental health service contact and mental health diagnosis in children exposed to DFV

Risk of mental health contact in children exposed to DFV

During their childhood, children exposed to DFV had an unadjusted 70 per cent increased risk of mental health contact compared to non-exposed children over the same period (Table 7). Following model adjustment, we found a statistically significant 49 per cent increased risk of mental health service contact, during childhood, for children exposed to DFV compared with non-exposed children.

Several other characteristics were found to be independently associated with mental health service contact including being Aboriginal and Torres Strait Islander, having disability, having a mother who was divorced or separated at the child's birth, and being born to a mother over 40 years of age (Table 7).

Mental health diagnosis in children exposed to DFV

Many children who were using mental health services had no formal mental health diagnosis captured in mental health services or hospital data – specifically, 12 per cent of children exposed to DFV and 6 per cent of non-exposed children. To gain an insight into the impact DFV exposure has on children's mental health, we investigated 10 subcategories of mental health (Figure 2). Details of adjusted hazard ratios presented can be found in Appendix B.

Following model adjustment, we found that children exposed to DFV had a 19 to 99 per cent higher risk of having a diagnosis in eight of the 10 subcategories compared to their non-exposed peers (Figure 2), with only the categories “organic disorder” and “other mental illness-related contacts” showing no significant risk increase.

As shown in Figure 2, children exposed to DFV had a two-fold increased risk of substance use disorder, a 76 per cent increased risk of personality disorder and a 59 per cent increased risk of self-harm compared to non-exposed children. We also found that children exposed to DFV had

Table 6: Sociodemographic information of the cohort

Characteristic	Childhood DFV N (%)	No recorded childhood DFV N (%)	p-value ^c
Aboriginal and/or Torres Strait Islander			
Yes	10,205 (62.4)	20,919 (49.8)	<0.0001
No	6,151 (37.6)	21,077 (50.2)	
Sex			
Female	7,984 (48.8)	20,537 (48.9)	0.346
Male	8,372 (50.2)	21,459 (51.1)	
Born prior to 37 weeks gestation			
Yes	2,324 (14.2)	4,353 (10.4)	<0.0001
No	14,032 (85.8)	37,643 (89.6)	
Mother's age at birth			
<20 years	4,205 (25.7)	6,122 (14.6)	<0.0001
20-29 years	9,460 (57.8)	22,774 (54.2)	
30-39 years	2,591 (15.8)	12,478 (29.7)	
40+ years	100 (0.6)	622 (1.5)	
Father's age at birth			
<20 years	1,313 (8.0)	2,260 (5.4)	<0.0001
20-29 years	6,755 (41.3)	16,754 (39.9)	
30-39 years	3,144 (19.2)	14,703 (35.0)	
40+ years	590 (3.6)	2,829 (6.7)	
Age missing	4,554 (27.8)	5,450 (13.0)	
Maternal marital status at birth			
Married/de facto/widowed	10,732 (65.6)	33,300 (79.3)	<0.0001
Never married	5,129 (31.4)	7,920 (18.9)	
Divorced/separated	369 (2.3)	564 (1.3)	
Unknown/not stated	126 (0.8)	212 (0.5)	
Socioeconomic status			
1-Most disadvantaged	8,966 (54.8)	20,569 (49.0)	<0.0001
2	3,457 (21.1)	9,549 (22.7)	
3	2,236 (13.7)	6,251 (14.9)	
4	1,159 (7.1)	3,857 (9.2)	
5-Least disadvantaged	538 (3.3)	1,760 (4.2)	
Residential remoteness			
Major cities	7,079 (43.3)	20,261 (48.3)	<0.0001
Inner regional	1,485 (9.1)	4,520 (10.8)	
Outer regional	2,318 (14.2)	6,725 (16.0)	

Characteristic		Childhood DFV	No recorded childhood DFV	p-value ^c
		N (%)	N (%)	
Remote	Remote	2,047 (12.5)	5,190 (12.4)	
	Very remote	3,427 (21.0)	5,300 (12.6)	
Mean age (years) of child at exposure to DFV				
		6.5 (SD 4.8) ^d		
Maternal mental health contact^a				
Yes	Yes	7,286 (44.6)	8,788 (20.9)	<0.0001
	No	9,070 (55.5)	33,208 (79.1)	
Disability				
Yes	Yes	2,495 (15.3)	5,071 (12.07)	<0.0001
	No	13,861 (84.8)	36,925 (87.9)	
Known to child protection services^b				
Yes	Yes	8,667 (53.0)	1,588 (3.8)	<0.0001
	No	7,689 (47.0)	40,408 (96.2)	
Mental health contact				
Yes	Yes	3,808 (23.3)	4,602 (11.0)	<0.0001
	No	12,548 (76.7)	37,394 (89.0)	
Mean age (years) of mental health contact				
		12.5 (SD 3.6)	11.6 (SD 4.3)	<0.0001

Notes: ^a Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health episode.

^b Child has a record of notification to department for child protection and family support.

^c p-value at 95 per cent level.

^d SD= standard deviation.

Sociodemographic groupings may not add to 100 per cent due to rounding.

a 49 per cent increased risk of anxiety disorder and a 39 per cent increased risk of schizophrenia compared with non-exposed children.

Characteristics associated with mental health service contact and diagnosis

Characteristics associated with increased risk of mental health service contact

Table 8 shows the results from multivariate modelling examining the association between characteristics and mental health service contact in exposed and non-exposed children.

Aboriginal and Torres Strait Islander children in the exposed group had a 25 per cent increased risk of mental health service contact, while there was a 35 per cent increased risk of mental

health service contact in non-exposed Aboriginal and Torres Strait Islander children. For children exposed to DFV, having disability was associated with a 41 per cent significantly increased risk of mental health service contact compared to children exposed to DFV with no disability. However, in non-exposed children with disability a significantly increased risk of 88 per cent was seen when compared to non-exposed children without disability.

In children exposed to DFV, having a mother under 30 years of age was associated with a 16 to 17 per cent reduced risk of mental health service contact when compared to children exposed to DFV born to a mother aged 30 to 39. This is in contrast to the non-exposed children, where being born to a teenage mother increased the risk of mental health service contact by 20 per cent when compared to non-exposed children born to a mother aged 30 to 39. Additionally, for non-exposed children, being born to a mother aged 20 to 29

Table 7: Adjusted and unadjusted risk of mental health service contact in childhood

Characteristic	Unadjusted hazard ratios (95% CI) ^c	Adjusted ^a hazard ratios (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	1.49 (1.42, 1.56)^d	1.34 (1.27, 1.42)
No	Reference group	Reference group
Sex		
Female	0.97 (0.93, 1.02)	0.99 (0.95, 1.04)
Male	Reference group	Reference group
Born prior to 37 weeks gestation		
Yes	1.36 (1.27, 1.46)	1.14 (1.07, 1.22)
No	Reference group	Reference group
Mother's age at birth		
< 20 years	1.47 (1.37, 1.57)	1.04 (0.96, 1.14)
20–29 years	1.15 (1.08, 1.22)	0.98 (0.92, 1.05)
30–39 years	Reference group	Reference group
40+ years	1.39 (1.13, 1.72)	1.29 (1.04, 1.60)
Father's age at birth		
< 20 years	1.54 (1.40, 1.70)	1.11 (0.99, 1.24)
20–29 years	1.25 (1.18, 1.32)	1.09 (1.03, 1.17)
30–39 years	Reference group	Reference group
40+ years	1.27 (1.14, 1.41)	1.23 (1.10, 1.37)
Missing age	1.75 (1.64, 1.87)	1.23 (1.14, 1.34)
Maternal marital status at birth		
Married/de facto/widowed	Reference group	Reference group
Never married	1.45 (1.38, 1.52)	1.13 (1.07, 1.20)
Divorced/separated	1.70 (1.45, 1.99)	1.36 (1.16, 1.60)
Unknown/not stated	2.23 (1.74, 2.86)	1.76 (1.37, 2.26)
Socioeconomic status		
1–Most disadvantaged	1.50 (1.31, 1.72)	1.31 (1.14, 1.51)
2	1.32 (1.15, 1.52)	1.25 (1.08, 1.44)
3	1.38 (1.19, 1.59)	1.31 (1.13, 1.52)
4	1.19 (1.02, 1.40)	1.21 (1.03, 1.42)
5–Least disadvantaged	Reference group	Reference group
Residential remoteness		
Major cities	1.07 (0.98, 1.15)	1.06 (0.97, 1.14)
Inner regional	Reference group	Reference group
Outer regional	1.04 (0.95, 1.15)	0.96 (0.88, 1.06)
Remote	1.17 (1.06, 1.28)^d	1.00 (0.91, 1.11)
Very remote	1.10 (1.00, 1.20)	0.81 (0.74, 0.89)

Characteristic	Unadjusted hazard ratios (95% CI) ^c	Adjusted ^a hazard ratios (95% CI)
Maternal mental health contact^b		
Yes	1.41 (1.35, 1.48)	1.16 (1.11, 1.22)
No	Reference group	Reference group
DFV during childhood		
Yes	1.70 (1.62, 1.78)	1.49 (1.42, 1.57)
No	Reference group	Reference group
Child has disability		
Yes	1.77 (1.67, 1.87)	1.67 (1.58, 1.77)
No	Reference group	Reference group

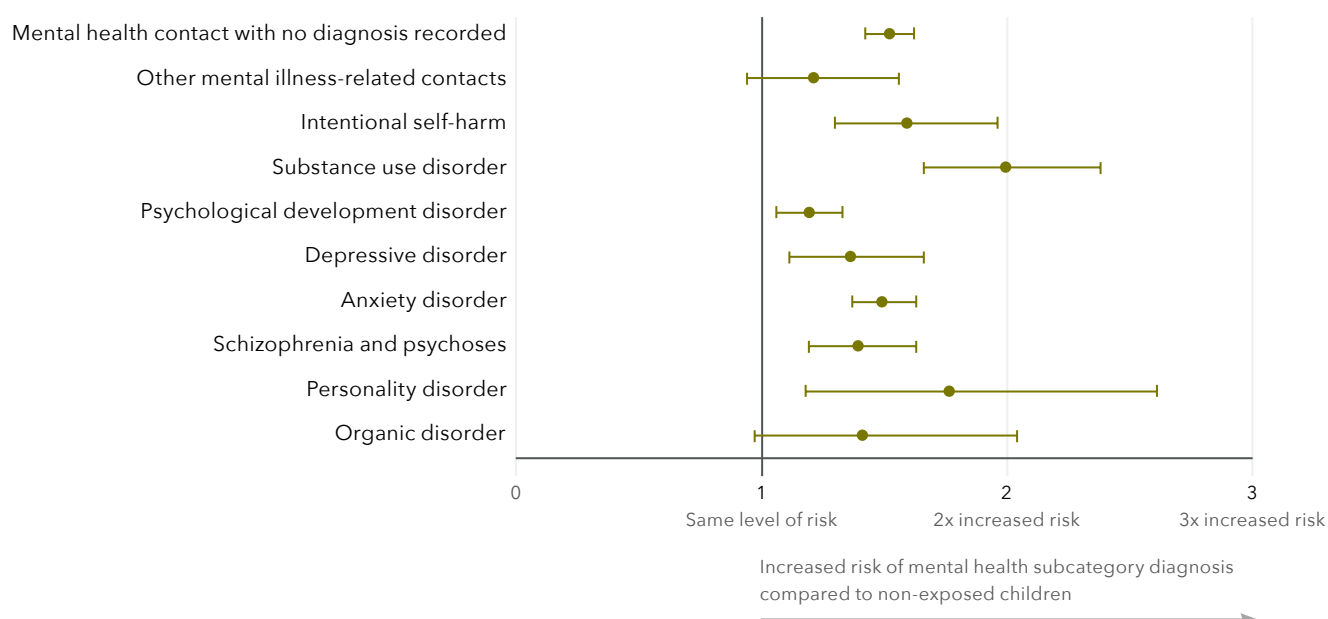
Notes: ^a Multivariate analysis adjusted for all characteristic variables in table.

^b Mother had a mental health diagnosis in HMDC, EDDC or MHIS records that occurred prior to the child's mental health contact.

^c CI = confidence interval.

^d Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Figure 2: Risk of child with DFV exposure having a mental health subcategory diagnosis compared to non-exposed children



Note: Risk calculated using adjusted hazard ratios. Individual models were run for each subcategory. Models were adjusted for Aboriginal and Torres Strait Islander status, sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness, disability and maternal mental health contact. Error bars denote 95 per cent confidence intervals.

had no significant impact on risk when compared to non-exposed children born to a mother aged 30 to 39. Maternal mental health contact did not increase the risk of mental health service contact for children exposed to DFV when compared to children exposed to DFV whose mother had no mental health service contact. Conversely, it was associated with a 34 per cent significantly increased risk in non-exposed children when compared to non-exposed children whose mother had no mental health service contact.

Low SES was associated with an increased risk of mental health service contact in non-exposed children, when compared to least disadvantaged SES children who were not exposed. However, low SES was not associated with mental health service contact in children exposed to DFV when compared to least disadvantaged SES children not exposed to DFV.

Characteristics associated with increased risk of mental health subtypes

Characteristics that were associated with an increased risk of mental health subtypes for children exposed to DFV are displayed in Table 9. The table only displays characteristics that were significantly associated with increased risk. The full set of results of all sociodemographic characteristics, stratified by DFV exposure, can be found in Appendix C.

For children exposed to DFV, being Aboriginal and Torres Strait Islander was associated with a significantly increased risk of substance use disorder of 192 per cent. For non-exposed children, being Aboriginal and Torres Strait Islander was correlated with a 360 per cent increased risk of substance use disorder (see Appendix C for all non-exposed results).

Being female was associated with a significantly increased risk of diagnosis in six of the mental health diagnostic subcategories for children exposed to DFV, ranging from a 36 per cent increased risk of anxiety disorder to a significantly increased risk (183%) of depressive disorder. Similarly, non-exposed female children also had a significantly increased risk in the same six subcategories, ranging from 48 per cent for anxiety disorder and personality disorder to 220 per cent for intentional self-harm.

Having disability was associated with a significant increase in the risk of a diagnosis in nine of the 10 mental disorder subcategories for children exposed to DFV. This association ranged from a 31 per cent increase in anxiety disorder to a 180 per cent increase in substance use disorder. Similarly, having disability was associated with an increased risk in seven of the 10 subcategories in non-exposed children, ranging from 61 per cent in anxiety disorder and personality disorder to 228 per cent in psychological development disorder.

Mental health service use and trajectories of children exposed to DFV

Probability of mental health service contact in childhood by DFV exposure

Figure 3 displays the cumulative probability of mental health service contact over time for children exposed to DFV and children not exposed. The cumulative probability of having a mental health service contact was higher for children exposed to DFV, who had a 78.6 per cent chance of having a mental health contact by age 18. For children not exposed to DFV the cumulative probability of having a mental health service contact was 15.9 per cent by age 18.

Probability of mental health service contact in childhood by sex and DFV exposure

Prior to 15 years of age, male children exposed to DFV had the highest probability of a mental health service contact with 17.5 per cent cumulative probability (Figure 4). However, at the end of follow-up, the cumulative probability of having a mental health service contact was highest in female children exposed to DFV: they had a 30.5 per cent chance of having a mental health service contact by 18 years of age, which is slightly higher than the 28 per cent cumulative probability seen in males at the same time point.

Table 8: Risk of mental health service contact in childhood for children exposed to DFV and children not exposed to DFV

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	1.25 (1.15, 1.37)^c	1.35 (1.25, 1.45)
No	Reference group	Reference group
Sex		
Female	1.02 (0.95, 1.10)	0.98 (0.92, 1.04)
Male	Reference group	Reference group
Born prior to 37 weeks gestation		
Yes	1.17 (1.06, 1.29)	1.11 (1.01, 1.22)
No	Reference group	Reference group
Mother's age at birth		
<20 years	0.83 (0.72, 0.95)	1.20 (1.07, 1.34)
20–29 years	0.84 (0.75, 0.94)	1.04 (0.96, 1.13)
30–39 years	Reference group	Reference group
40+ years	1.26 (0.82, 1.92)	1.30 (1.01, 1.67)
Father's age at birth		
< 20 years	1.09 (0.92, 1.29)	1.09 (0.94, 1.27)
20–29 years	1.13 (1.01, 1.26)	1.05 (0.97, 1.14)
30–39 years	Reference group	Reference group
40+ years	1.31 (1.07, 1.61)	1.19 (1.04, 1.36)
Missing age	1.23 (1.09, 1.39)	1.22 (1.10, 1.36)
Maternal marital status at birth		
Married/de facto/widowed	Reference group	Reference group
Never married	1.05 (0.97, 1.14)	1.19 (1.10, 1.29)
Divorced/separated	1.11 (0.88, 1.42)	1.54 (1.25, 1.91)
Unknown/not stated	1.81 (1.27, 2.59)	1.68 (1.17, 2.39)
Socioeconomic status		
1–Most disadvantaged	1.06 (0.86, 1.31)	1.51 (1.25, 1.83)
2	1.02 (0.83, 1.27)	1.43 (1.18, 1.73)
3	1.19 (0.96, 1.49)	1.42 (1.16, 1.73)
4	1.05 (0.82, 1.33)	1.34 (1.09, 1.66)
5–Least disadvantaged	Reference group	Reference group
Residential remoteness		
Major cities	1.11 (0.97, 1.27)	1.02 (0.92, 1.13)
Inner regional	Reference group	Reference group
Outer regional	1.00 (0.85, 1.16)	0.95 (0.84, 1.06)
Remote	1.03 (0.87, 1.20)	0.98 (0.87, 1.11)
Very remote	0.81 (0.69, 0.94)	0.81 (0.71, 0.92)

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Maternal mental health contact^b		
Yes	0.94 (0.88, 1.02)	1.34 (1.26, 1.43)
No	Reference group	Reference group
Child has disability		
Yes	1.41 (1.28, 1.54)	1.88 (1.74, 2.02)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

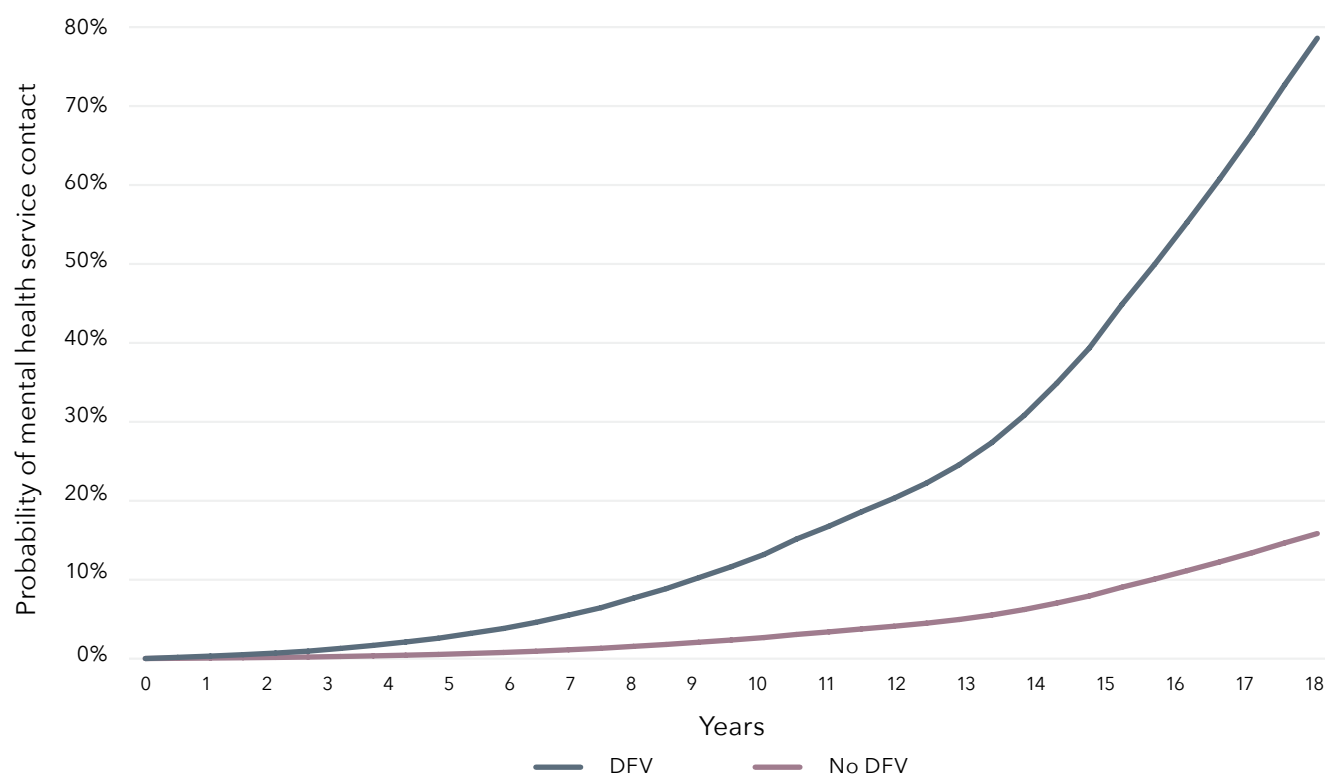
Table 9: Association of sociodemographic characteristics on the risk of childhood mental health diagnosis by subcategory in children exposed to DFV

Sociodemographic characteristics	Anxiety disorder	Psychological development	Substance use disorder	Schizophrenia and psychoses	Intentional self-harm	Depressive disorder	Organic disorder	Personality disorder	Other mental illness-related contacts	Mental health contact with no diagnosis recorded
Aboriginal and Torres Strait Islander			192%							
Female	36%			95%	181%	183%		100%	100%	
Born prior to 37 weeks gestation		35%								19%
Father's age at birth 20-29 years		31%								
Father's age at birth missing ^a		45%			89%					
Maternal marital status at birth: divorced/separated										36%
ARIA: major city		48%								
Child has disability	31%	167%	180%	53%	55%	72%	113%	149%	149%	

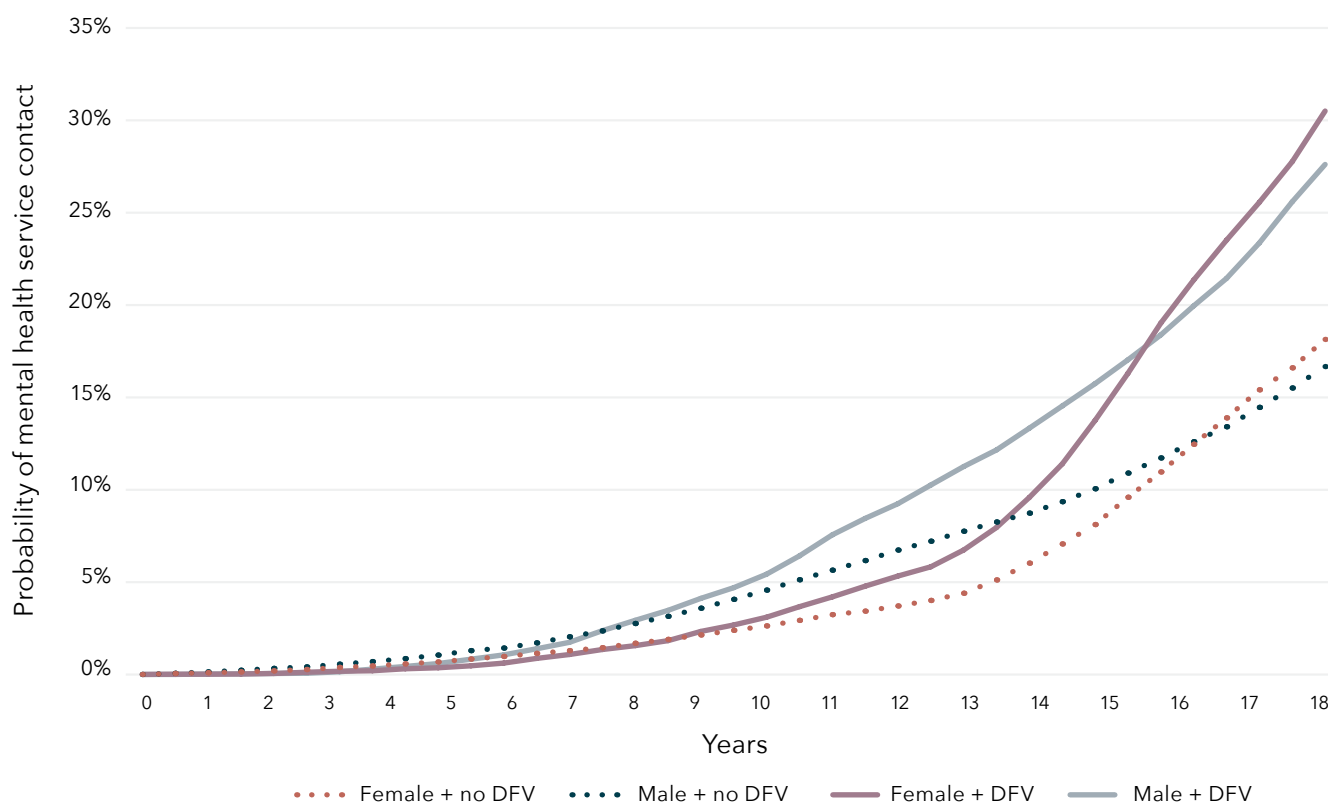
Notes: ^a Father's age at birth missing in Midwives Notification System.

Models were adjusted for Aboriginal and Torres Strait Islander status, sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness, disability and maternal mental health contact.

Grey shading indicates that the associated risk is lower than that observed in children not exposed to DFV. Amber shading indicates the associated risk is greater than observed in children not exposed to DFV.

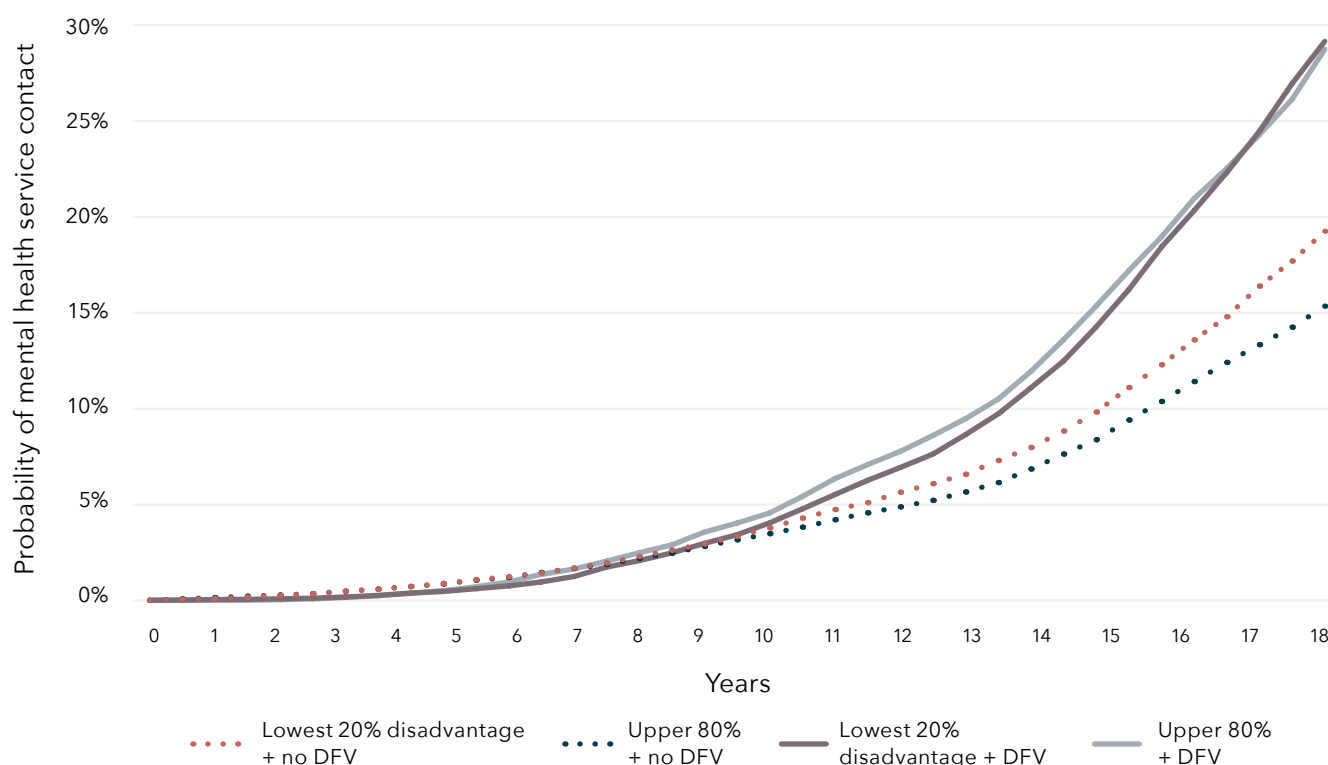
Figure 3: Cumulative probability of mental health service contact over time by DFV exposure

Note: Differences in cumulative probability between children exposed and not exposed to DFV: Gray's p -value < 0.0001.

Figure 4: Cumulative probability of mental health service contact over time by exposure status and sex

Notes: Differences in cumulative probability between non-exposed female and non-exposed male: Gray's p =0.0748.

Differences in cumulative probability between exposed female and exposed male: Gray's p =0.9367.

Figure 5: Cumulative probability of mental health service contact over time by exposure status and socioeconomic status

Notes: Differences in cumulative probability between least and most disadvantaged non-exposed children: Gray's $p < 0.0001$. Differences in cumulative probability between least and most disadvantaged children exposed to DFV: Gray's $p = 0.8011$.

Probability of mental health service contact in childhood by SES and DFV exposure

Figure 5 displays the cumulative probability of having a mental health service contact by 18 years of age, stratified by SES and DFV exposure. Due to low counts within the initial quintiles of SES, the categories were collapsed to “lowest 20 per cent disadvantage” (i.e. the lowest 20th percentile of most disadvantaged) and “upper 80 per cent of disadvantage” (i.e. the upper 80th percentile of least disadvantaged). There was minimal difference between the trajectories for lower and upper disadvantage groups, with the most variation observed within the non-exposure group. The cumulative probability of having a mental health service contact by 18 years was 28.7 per cent for those exposed to DFV, irrespective of their SES status.

Probability of mental health service contact in childhood by disability status and DFV exposure

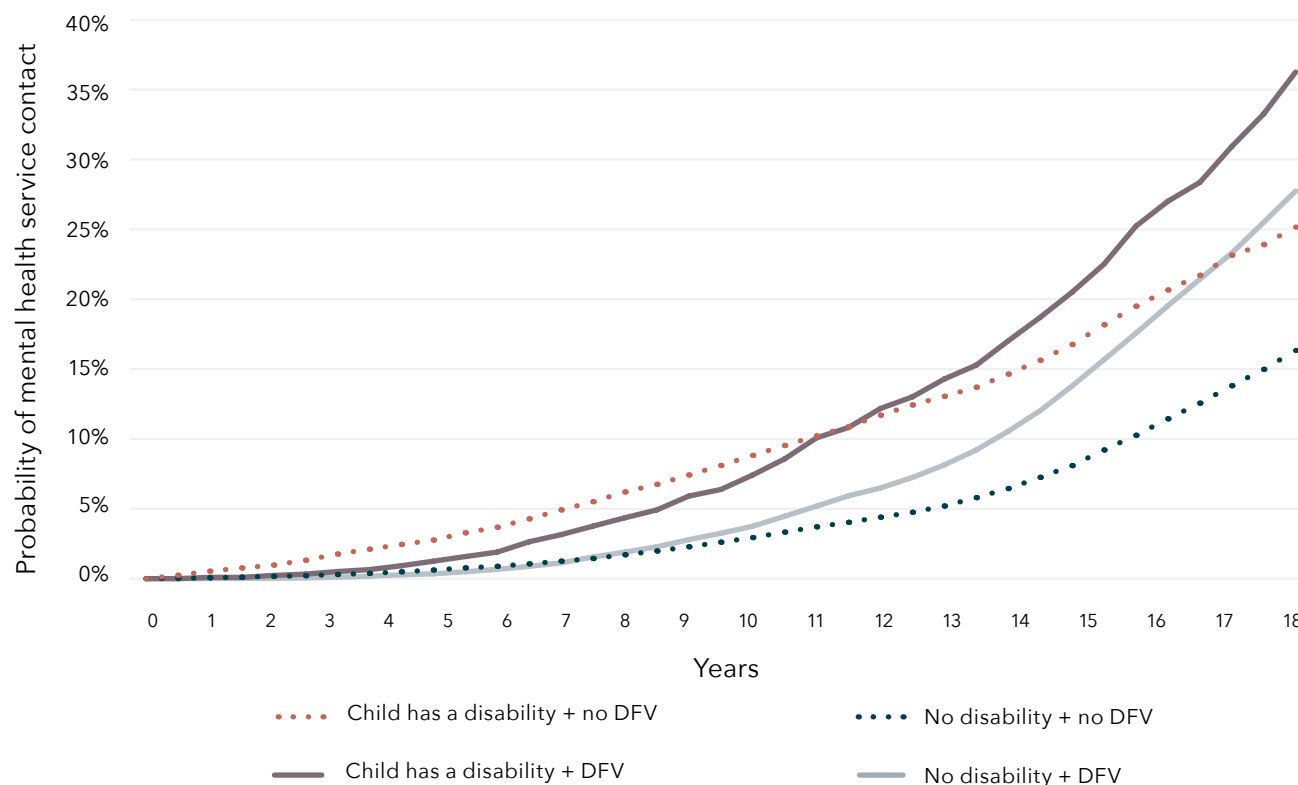
The comparison of children with and without disability and their cumulative probability of having a mental health service contact by exposure status is shown in Figure 6. Until age 10, children with disability and no DFV exposure had the highest probability of mental health service contact of all four groups. However, after 10 years of age, children with disability who were exposed to DFV had the highest

cumulative probability of a mental health service contact: 36.3 per cent by the time they reach 18.

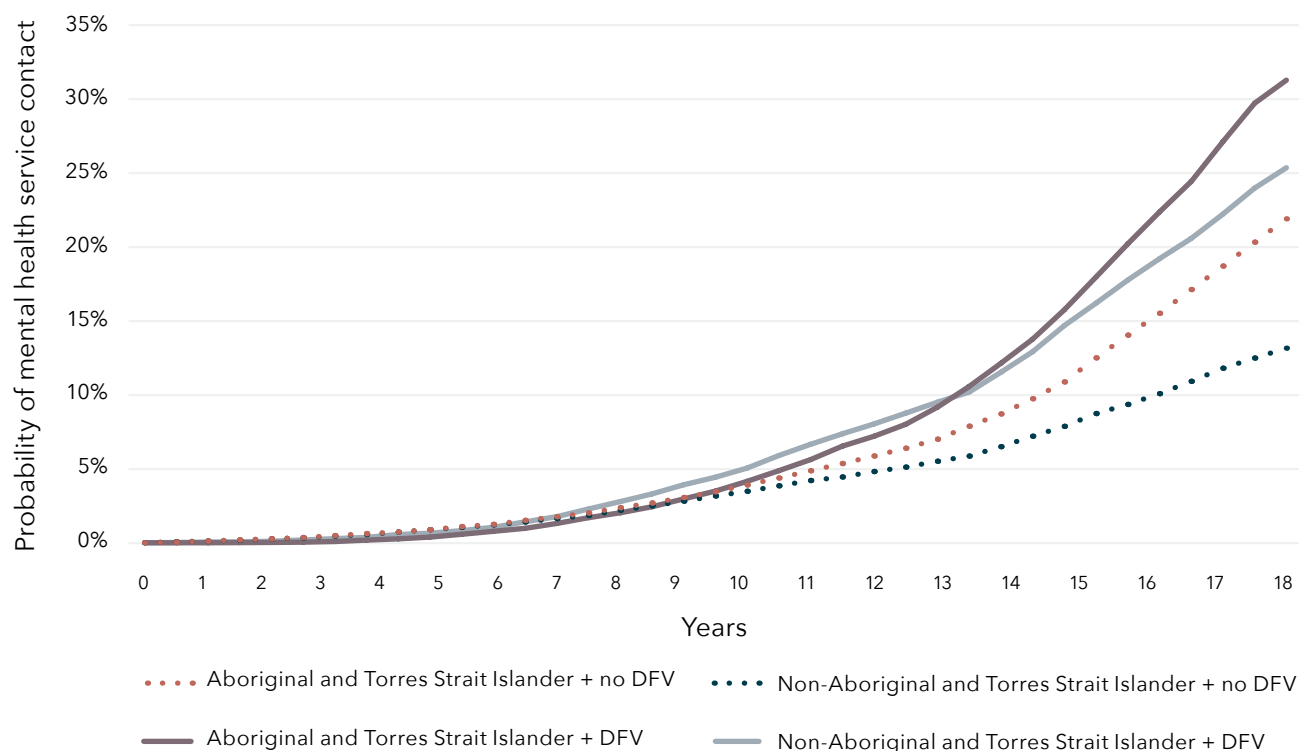
For children without disability, the cumulative probability of mental health service contact was similar until around age 9, after which point the trajectory increased more rapidly in children exposed to DFV. By age 18, non-exposed children without disability had a 16.3 per cent likelihood of mental health service contact whereas children exposed to DFV without disability had a 27.7 per cent cumulative probability of mental health service contact.

Probability of mental health service contact in childhood by Aboriginal and Torres Strait Islander status and DFV exposure

Prior to 12 years of age, non-Aboriginal and Torres Strait Islander children exposed to DFV had the highest cumulative probability of mental health service contact: 8.8 per cent of the four groups (Figure 7). However, over time, the cumulative probability of having a mental health service contact is highest for Aboriginal and Torres Strait Islander children exposed to DFV, who had a 31.6 per cent probability of having a mental health service contact by 18. By the end of follow-up, non-Aboriginal and Torres Strait Islander children with no DFV exposure had the lowest cumulative probability of having a mental health service contact (13.2%).

Figure 6: Cumulative probability of mental health service contact over time by exposure status and disability

Notes: Differences in cumulative probability between non-exposed children with disability and without: Gray's $p < 0.0001$.
 Differences in cumulative probability between children exposed to DFV with disability and without: Gray's $p < 0.0001$.

Figure 7: Cumulative probability of mental health service contact over time by exposure status and Aboriginal and Torres Strait Islander status

Notes: Differences in cumulative probability between Aboriginal and Torres Strait Islander children with and without exposure: Gray's $p < 0.0001$.
 Differences in cumulative probability between non-Aboriginal and Torres Strait Islander children with and without exposure: Gray's $p < 0.0001$.

Aboriginal and Torres Strait Islander children

Characteristics associated with increased risk of mental health service contact in Aboriginal and Torres Strait Islander children

Table 10 displays the characteristics associated with mental health service contact for Aboriginal and Torres Strait Islander children exposed to DFV and Aboriginal and Torres Strait Islander children not exposed to DFV. Accounting for sociodemographic characteristics, Aboriginal and Torres Strait Islander children exposed to DFV who were born pre-term (prior to 37 weeks gestation) were 18 per cent more likely to have a mental health service contact than those born at term. Similar associated increased risk was seen in Aboriginal and Torres Strait Islander children born pre-term but not exposed to DFV.

For Aboriginal and Torres Strait Islander children exposed to DFV, being born to a mother aged under 30 was associated with a decreased risk of mental health service contact of 18 to 25 per cent, compared to those with an older mother. Conversely, maternal age was not associated with mental health service contact for non-exposed Aboriginal and Torres Strait Islander children. Being born to a father aged over 40 was associated with an increased risk of mental health service contact by 68 per cent in Aboriginal and Torres Strait Islander children exposed to DFV, compared with having a younger father. Father's age was not associated with mental health service contact for Aboriginal and Torres Strait Islander children not exposed to DFV.

Having a mother's marital status at birth missing or unknown in the Midwives Notification System was associated with an increased risk of mental health service contact of 75 per cent in Aboriginal and Torres Strait Islander children exposed to DFV, compared to those whose mother was married, widowed or in a de facto relationship. A similar risk increase was observed in the non-exposed children. Unlike children exposed to DFV, where no association was found, being born to a mother who was divorced was observed to increase the risk of mental health service contact by 35 per cent in Aboriginal and Torres Strait Islander children not exposed to DFV.

Being born in a major city was associated with an increased risk of mental health service contact for Aboriginal and Torres Strait Islander children exposed to DFV by 37 per cent compared with children exposed to DFV residing in inner regional areas. A 19 per cent increased risk in mental health service contact was observed in the non-exposed Aboriginal and Torres Strait Islander children residing in major cities compared to non-exposed inner regional children. Conversely, for Aboriginal and Torres Strait Islander children not exposed to DFV, residing in a very remote regional area was associated with a 16 per cent decreased risk of mental health service contact compared to those in inner regional areas. However, no significant association was seen in children exposed to DFV residing in a remote area for mental health service contact.

Being born to a mother who had a prior mental health contact was not associated with mental health service contact in children exposed to DFV. However, it was associated with a 10 per cent increase in risk of contact in non-exposed children.

For Aboriginal and Torres Strait Islander children exposed to DFV, having disability was associated with a 28 per cent greater risk of mental health service contact than Aboriginal and Torres Strait Islander children exposed to DFV who do not have disability. However, for non-exposed Aboriginal and Torres Strait Islander children, having disability was associated with a higher risk of 75 per cent, when compared to non-exposed Aboriginal and Torres Strait Islander children without disability.

Subcategories of mental health diagnosis

Aboriginal and Torres Strait Islander children

Following model adjustment, we observed that Aboriginal and Torres Strait Islander children exposed to DFV had a significantly higher risk of having a diagnosis in six of the 10 subcategories compared to their non-exposed peers (Figure 8), with significant risk increases ranging from 33 per cent for schizophrenia to 85 per cent for substance use. A 67 per cent increased risk of self-harm diagnosis was seen

Table 10: Risk of mental health service contact in childhood for Aboriginal and Torres Strait Islander children with exposure to DFV and without exposure to DFV

Characteristic	Exposed to DFV adjusted hazard ratios ^b (95% CI)	No DFV exposure adjusted hazard ratios (95% CI)
Sex		
Female	0.97 (0.89, 1.06)	0.93 (0.86, 1.00)
Male	Reference group	Reference group
Born prior to 37 weeks gestation		
Yes	1.18 (1.05, 1.33)^c	1.14 (1.02, 1.28)
No	Reference group	Reference group
Mother's age at birth		
<20 years	0.75 (0.63, 0.88)	1.10 (0.96, 1.27)
20–29 years	0.82 (0.71, 0.94)	0.98 (0.88, 1.10)
30–39 years	Reference group	Reference group
40+ years	0.85 (0.42, 1.73)	1.32 (0.90, 1.92)
Father's age at birth		
<20 years	1.08 (0.88, 1.34)	1.01 (0.85, 1.20)
20–29 years	1.07 (0.92, 1.24)	0.96 (0.86, 1.08)
30–39 years	Reference group	Reference group
40+ years	1.68 (1.30, 2.18)	1.22 (0.99, 1.49)
Missing age	1.15 (0.99, 1.34)	1.17 (1.03, 1.32)
Maternal marital status at birth		
Married/de facto/widowed	Reference group	Reference group
Never married	1.03 (0.93, 1.13)	1.09 (1.00, 1.20)
Divorced/separated	1.17 (0.86, 1.58)	1.35 (1.05, 1.75)
Unknown/not stated	1.75 (1.18, 2.61)	1.74 (1.19, 2.56)
Socioeconomic status		
1–Most disadvantaged	0.90 (0.67, 1.21)	1.29 (0.96, 1.74)
2	0.91 (0.67, 1.24)	1.22 (0.90, 1.66)
3	1.02 (0.74, 1.39)	1.32 (0.97, 1.81)
4	1.16 (0.82, 1.64)	1.40 (1.01, 1.95)
5–Least disadvantaged	Reference group	Reference group
Residential remoteness		
Major cities	1.37 (1.11, 1.68)	1.19 (1.02, 1.39)
Inner regional	Reference group	Reference group

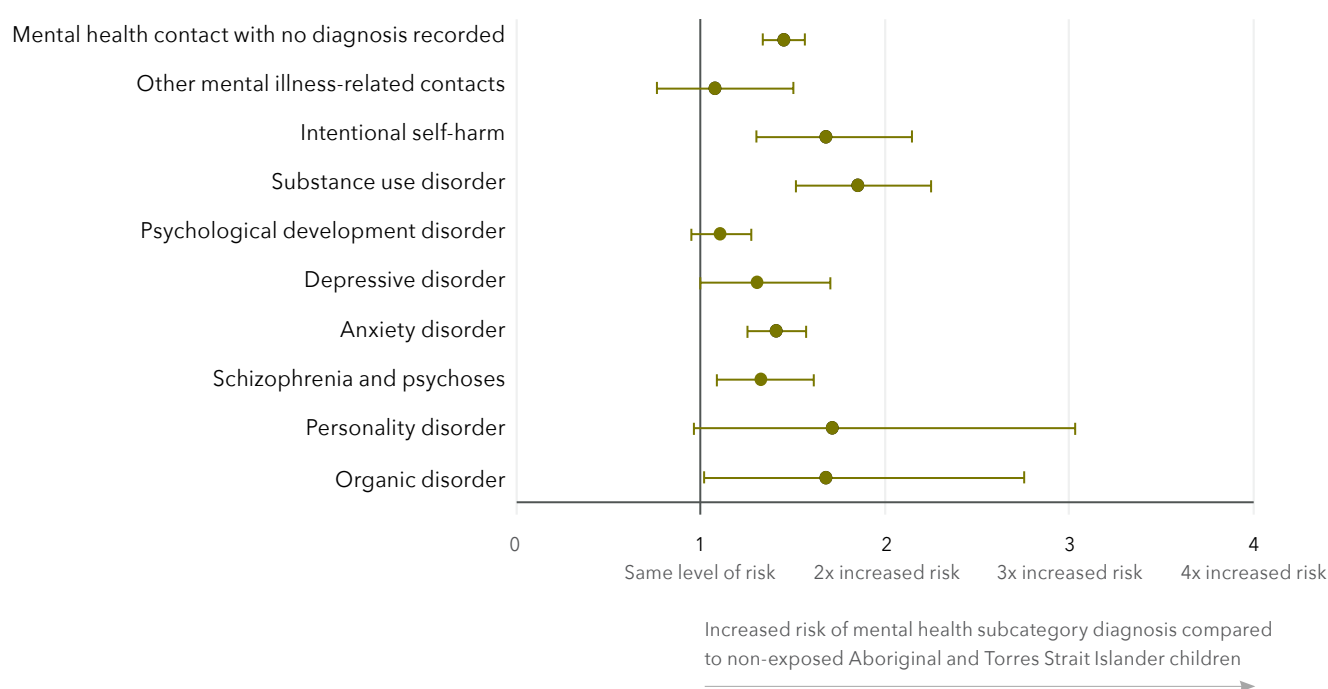
Characteristic	Exposed to DFV adjusted hazard ratios ^b (95% CI)	No DFV exposure adjusted hazard ratios (95% CI)
Outer regional	1.14 (0.91, 1.42)	1.00 (0.84, 1.18)
Remote	1.16 (0.93, 1.45)	1.01 (0.86, 1.20)
Very remote	0.94 (0.77, 1.16)	0.84 (0.72, 0.99)
Maternal mental health contact^a		
Yes	0.87 (0.79, 0.95)	1.10 (1.02, 1.20)
No	Reference group	Reference group
Child has disability		
Yes	1.28 (1.14, 1.43)	1.75 (1.59, 1.93)
No	Reference group	Reference group

Notes: ^a Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health episode.

^b Multivariate analysis adjusted for all characteristic variables in table.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Figure 8: Risk of Aboriginal and Torres Strait Islander child with DFV exposure having a mental health subcategory compared to non-exposed Aboriginal and Torres Strait Islander children

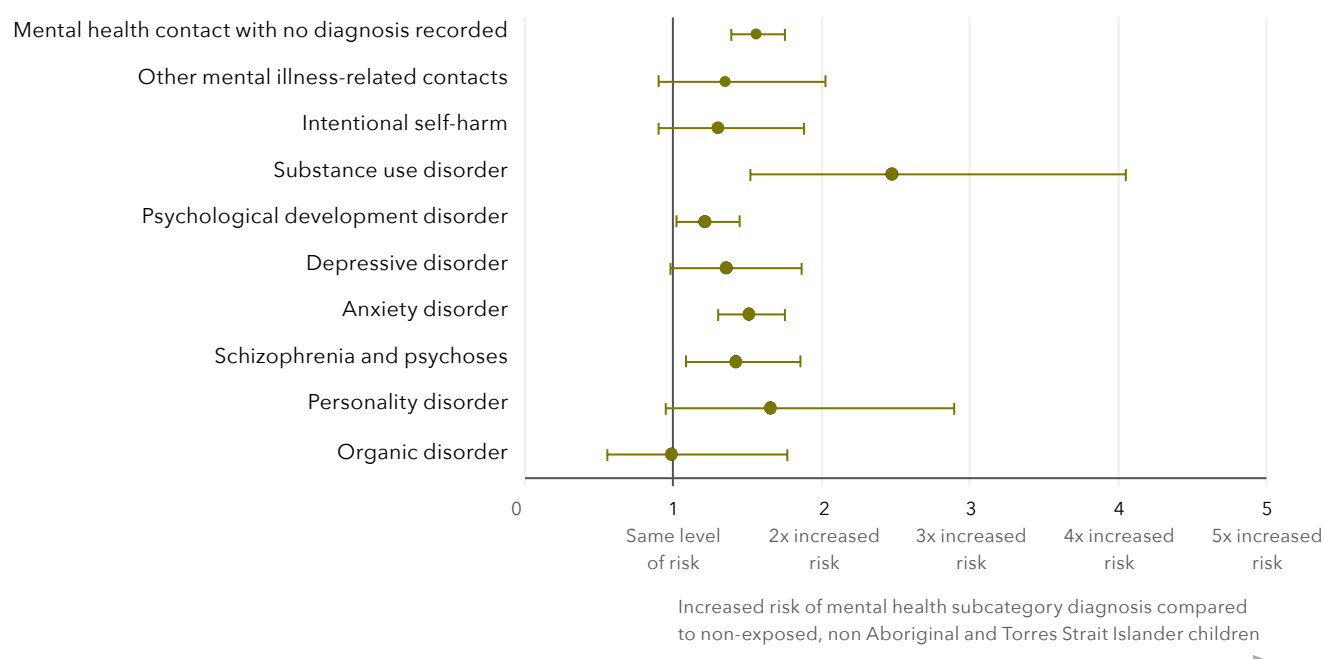


Notes: Individual models were run for each subcategory. Models were adjusted for sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness, disability and maternal mental health contact. Risk estimates are presented as hazard ratios; error bars denote 95 per cent confidence intervals.

in Aboriginal and Torres Strait Islander children exposed to DFV compared with non-exposed Aboriginal and Torres Strait Islander children. Details of adjusted hazard ratios presented in Figure 8 can be found in Appendix D.

Non-Aboriginal and Torres Strait Islander children
Non-Aboriginal and Torres Strait Islander children exposed to DFV were observed to have a significantly higher risk of

Figure 9: Risk of non-Aboriginal and/or Torres Strait Islander child with DFV exposure having a mental health subcategory compared to non-exposed, non-Aboriginal and Torres Strait Islander children



Notes: Individual models were run for each subcategory. Models were adjusted for sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness, disability and maternal mental health contact. Risk estimates are presented as hazard ratios; error bars denote 95 per cent confidence intervals.

having a diagnosis in five of the 10 subcategories compared to their non-exposed peers, ranging from 22 per cent for psychological development to 148 per cent for substance use disorder (Figure 9). Details of adjusted hazard ratios presented in Figure 9 can be found in Appendix D.

Disability

Characteristics associated with increased risk of mental health service contact in children with disability

Table 11 displays the characteristics associated with mental health service contact for both children with disability who are exposed to DFV and children with disability who are not exposed to DFV. Accounting for sociodemographic characteristics, children with disability exposed to DFV who were born pre-term (prior to 37 weeks gestation) were 23 per cent more likely to have a mental health service contact than DFV-exposed children born at term. Being born early was not associated with mental health service contact in children with disability not exposed to DFV.

For a child with disability and who was exposed to DFV, being born to a father aged over 40 years was associated with a 78 per cent increased risk of mental health service contact, compared with their DFV-exposed peers born to a father aged 30–39 years. However, father's age was not associated

with the risk of mental health service contact in children with disability but not exposed to DFV.

Maternal marital status at birth being unknown or missing in the Midwives Notification System was associated with a 116 per cent increase in the risk of mental health service contact in children with disability exposed to DFV compared to those DFV-exposed children with disability whose mother was married, widowed or in a de facto relationship. However, for children with disability who were not exposed to DFV the associated risk was 179 per cent. For children with disability who were not exposed to DFV, being born to a mother who was never married was associated with a 27 per cent increased risk of mental health service contact compared to non-exposed children with disability born to a mother who was married, widowed or in a de facto relationship. For children with disability who were exposed to DFV, being born to a mother who was never married had no observed relationship with risk of mental health service contact.

SES was not associated with the risk of mental health service contact in children with disability exposed to DFV. However, being from the most disadvantaged SES and from the second-most advantaged SES was associated with an increased risk of mental health service contact in children with disability not exposed to DFV (67% and 70% respectively).

Table 11: Risk of mental health service contact in childhood for children with disability and exposure to DFV and children with disability without exposure to DFV

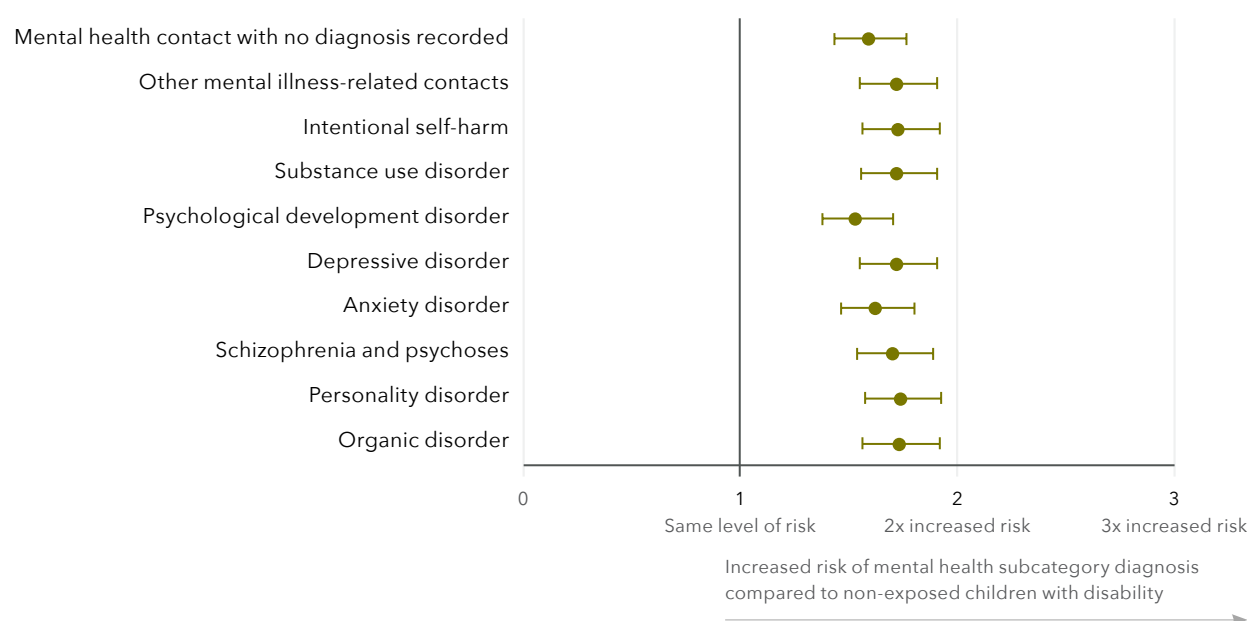
Characteristic	Exposed to DFV adjusted hazard ratios ^b (95% CI)	No DFV exposure adjusted hazard ratios (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	1.13 (0.92, 1.38)	1.27 (1.08, 1.50)^c
No	Reference group	Reference group
Sex		
Female	0.86 (0.73, 1.02)	0.91 (0.80, 1.05)
Male	Reference group	Reference group
Born prior to 37 weeks gestation		
Yes	1.23 (1.02, 1.49)	0.98 (0.82, 1.18)
No	Reference group	Reference group
Mother's age at birth		
<20 years	0.78 (0.58, 1.05)	1.22 (0.94, 1.58)
20–29 years	0.87 (0.69, 1.10)	1.08 (0.90, 1.29)
30–39 years	Reference group	Reference group
40+ years	0.96 (0.42, 2.21)	1.57 (0.98, 2.51)
Father's age at birth		
<20 years	1.21 (0.79, 1.85)	0.86 (0.59, 1.26)
20–29 years	1.37 (1.05, 1.78)	0.98 (0.82, 1.18)
30–39 years	Reference group	Reference group
40+ years	1.78 (1.18, 2.69)	1.08 (0.81, 1.43)
Missing age	1.44 (1.08, 1.91)	1.13 (0.89, 1.42)
Maternal marital status at birth		
Married/de facto/widowed	Reference group	Reference group
Never married	1.06 (0.88, 1.28)	1.27 (1.06, 1.52)
Divorced/separated	0.93 (0.53, 1.62)	1.44 (0.89, 2.32)
Unknown/not stated	2.16 (1.01, 4.59)	2.79 (1.48, 5.26)
Socioeconomic status		
1–Most disadvantaged	1.48 (0.91, 2.42)	1.67 (1.04, 2.70)
2	1.43 (0.86, 2.37)	1.60 (0.98, 2.60)
3	1.38 (0.82, 2.31)	1.50 (0.91, 2.46)
4	1.69 (0.97, 2.95)	1.70 (1.02, 2.83)
5–Least disadvantaged	Reference group	Reference group
Residential remoteness		
Major cities	1.39 (0.98, 1.96)	0.90 (0.72, 1.13)
Inner regional	Reference group	Reference group
Outer regional	1.18 (0.79, 1.76)	0.95 (0.73, 1.24)
Remote	1.11 (0.73, 1.70)	0.85 (0.63, 1.13)
Very remote	0.83 (0.56, 1.22)	0.75 (0.56, 1.00)
Maternal mental health contact^a		
Yes	0.96 (0.82, 1.14)	1.16 (1.00, 1.35)
No	Reference group	Reference group

Notes: ^a Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health episode.

^b Multivariate analysis adjusted for all characteristic variables in table.

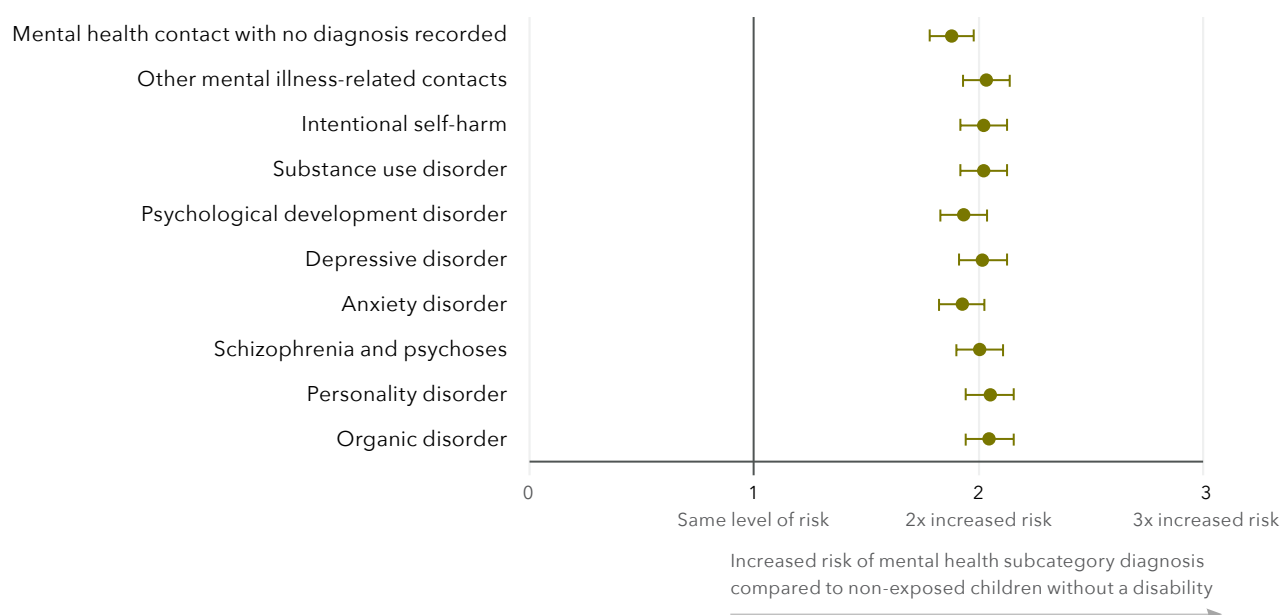
^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Figure 10: Risk of children with disability exposed to DFV having a mental health subcategory compared to non-exposed children with disability



Notes: Individual models were run for each subcategory. Models were adjusted for sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness, disability and maternal mental health contact. Risk estimates are presented as hazard ratios; error bars denote 95 per cent confidence intervals.

Figure 11: Risk of children with no disability exposed to DFV having a mental health subcategory compared to non-exposed children with no disability



Notes: Individual models were run for each subcategory. Models were adjusted for sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness, disability and maternal mental health contact. Risk estimates are presented as hazard ratios; error bars denote 95 per cent confidence intervals.

Subcategories of mental health diagnosis

In children with disability, exposure to DFV was associated with an increased risk of diagnosis in all mental health subcategories when compared to non-exposed children with disability (Figures 10 & 11). The level of risk increase ranged from 53 per cent for psychological development diagnosis to 74 per cent for personality disorder. Similarly, in children

without disability, exposure to DFV was associated with an increased risk of diagnosis for all subcategories compared to non-exposed peers, ranging from 88 per cent for no diagnosis to 105 per cent increased risk in organic disorders and personality disorders. Further details of adjusted hazard ratios presented can be found in Appendix E.

Discussion

The aim of this research was to investigate the mental health service use of children exposed to DFV and the diagnosis subtypes of these children. We also aimed to identify sociodemographic characteristics that were predictive of diagnosis in children exposed to DFV. Additionally, we aimed to investigate the mental health service use and diagnosis of Aboriginal and Torres Strait Islander children and children with disability.

Mental health service contact

Findings from this research have shown that exposure to DFV in childhood is associated with an increased risk of mental health service contact during childhood. Our findings have some accord with existing research that acknowledges higher rates of DFV exposure in children using mental health services (Hultmann & Broberg, 2016; Ormhaug et al., 2012; Olaya et al., 2010). Hultmann and Broberg (2016) found that almost half of the children involved in Swedish mental health services had been exposed to DFV – five times higher than the rate of DFV in the general population. Our findings are different in that we measured mental health service contact in a DFV-exposed population and not DFV in a mental health service user population. Despite the differences, we have provided further robust evidence that DFV exposure is associated with an impact on children’s mental health.

The child’s involvement in mental health services should not necessarily be seen as a negative. Children exposed to DFV have experienced trauma and many are likely to need mental health services to aid them with addressing the trauma. However, it is concerning that, while the average age of exposure recorded in our data was 6.5 years, mental health service contact did not occur until the child was an average age of 12.5, similar to the service contact age in non-exposed children. Previous research has found that children exposed to trauma including DFV are more likely to need urgent mental health service access than those who have had no trauma exposure (Marshall et al., 2020). Early access to mental health services is important for children as it can reduce the long-term impact of mental illness (Colizzi et al., 2020; MacDonald et al., 2018). It is acknowledged that there are significant gaps in Australian mental health services for children aged 0 to 12 (Australian Government, 2021), with

psychiatric experts describing Australia’s mental health system as “broken” (National Mental Health Commission, 2020a). At present Australia’s mental health service is focused on specialist intervention not prevention and early intervention (Australian Government, 2021). However, the recently published *National Children’s Mental Health and Wellbeing Strategy* (Australian Government, 2021) aims to address these issues with priority given to children 0 to 12 years.

Early intervention is needed. This intervention should be underpinned by a public health approach addressing primary, secondary and tertiary prevention (Dahlberg & Krug, 2002; García-Moreno et al., 2015; Harvey et al., 2007). Investment is needed in primary prevention, that is, to prevent exposure before it occurs and hence eliminate subsequent negative outcomes. However, dual investment is needed in secondary and tertiary response and prevention measures to support the mental health of children exposed to DFV (National Mental Health Commission, 2020b). Early intervention for children’s mental health should address the impact of DFV exposure and its social determinants (Australian Government, 2021). This approach aligns with the *National Children’s Mental Health and Wellbeing Strategy* (Australian Government, 2021), which acknowledges the need to address the impact of trauma and social determinants on children’s mental health and wellbeing. Without early intervention the child may potentially live with trauma and mental illness for many years impacting their ability to meet their full potential in education, relationships, employment and earning potential in adulthood (Altszuler et al., 2016; Australian Government, 2021; Clark et al., 2017; Colman et al., 2009; Erskine et al., 2016; McLeod & Kaiser, 2004). Additionally, it costs significantly more to treat mental illness in adolescence and adulthood than it does to intervene in early childhood (Teager et al., 2019). A further complexity is that the utilisation of health services for children exposed to DFV is multifaceted (Olaya et al., 2010; Onyskiw, 2002). Parents may not engage their child in mental health services for various reasons including fear of DFV being divulged by the child that may result in negative repercussions for mother and child from the perpetrator (Alaggia et al., 2011; Evans & Feder, 2016); mothers may be fearful of child removal if child protection services become involved (Alaggia et al., 2011; O’Donnell et al., 2015) and of the impact on the mother’s visa status if they are a dependant on their partner’s residency

visa (Borges Jelinic, 2019). Additionally, there could be a delay due to the “sleeping effect” where symptoms may not manifest for many years after the exposure (Vu et al., 2016).

Diagnosis types

It is evident from our findings that exposure to DFV is associated with a significant impact on children’s mental health. This finding is in keeping with Bronfenbrenner’s (1977) theory that a child’s environment impacts human development. Children exposed to DFV were statistically more likely to have a higher risk in eight of the 10 mental health diagnosis subcategories than non-exposed children. The highest associated risk observed was a two-fold increased risk in substance use disorder. Our finding has some accord with previous longitudinal research that reported exposure to adverse childhood experiences, including DFV, was predictive of substance misuse (Rogers et al., 2021). Rogers and colleagues (2021) investigated substance misuse in children and young people from 14 to 26 years of age, finding that it increased at higher rates over time into early adulthood for children exposed to adverse events compared to those not exposed. The mental health of our cohort was investigated until they reached 18 years of age. In light of the findings by Rogers and colleagues (2021) there is a need to investigate the mental health of children past childhood and into adulthood. For women subjected to DFV it is acknowledged that many misuse substances as a coping mechanism (Gezinski et al., 2021). For some children exposed to DFV substance use may also be a coping mechanism; further research is needed to gain a greater understanding of substance use in children exposed to DFV.

We also found an increased risk of personality disorder to be associated with DFV exposure. Personality disorders are thought to be caused by a combination of genetic and environmental factors, including trauma (Cattane et al., 2017). Our finding aligns with the cross-sectional research of Afifi and colleagues (2019) who found maltreatment in childhood, including DFV, was associated with an increased likelihood of personality disorder. Previous research has found a clear relationship between personality disorder and DFV perpetration and victimisation (Collison & Lynam, 2021; Jackson et al., 2015). Additionally, in some cases, children

exposed to DFV may be at risk of becoming perpetrators or victims of DFV in adulthood (Ehrensaft et al., 2003; Smith et al., 2011). For the children exposed to DFV with personality disorder, it could be postulated that the risk of transgenerational abuse may be greater. The evidence, however, is not robust and, as such, further research is clearly warranted to understand these complex associations more fully.

Exposure to DFV was associated with a 49 per cent increased risk of anxiety disorder, when compared to non-exposed children. While our findings align with recent Australian research (Gartland et al., 2021), some differences are noted. Gartland and colleagues (2021) reported a twofold increased likelihood of anxiety in children who were recently exposed to DFV which differs from our reported increase. The differences may be attributed to the approach used to identify anxiety and the differing ages between the studies. Gartland and colleagues measured anxiety at age 10, whereas the children’s anxiety in our cohort could be identified at any point in childhood. The key point, however, is that the children identified in our data as having their first mental health contact were, on average, aged 12.5 years, and therefore missing early childhood intervention. In consideration of Gartland’s findings and the Australian Government’s (2021) acknowledgement that there are service gaps in Australian mental health services for children aged 0 to 12 it is likely that our measurement of risk is an underestimation of the true association.

In keeping with existing literature (Huang et al., 2021; Kennedy et al., 2010; Kimball, 2016) we found that children’s exposure to DFV was associated with an increased risk of depression compared to non-exposed children. The aetiology of depression is multifactorial, with multiple ecological factors thought to play a part including genetics, exposure to stressful events (including DFV exposure) and low SES (Colman & Ataullahjan, 2010; Najman et al., 2010; Zalsman et al., 2006). As an example of the impact of low SES, recent international research (Marçal, 2021) has reported that housing insecurity mediates the risk of depression in children exposed to DFV. In Australia, utilising data from the Australian Specialist Homelessness Services Collection (AIHW, 2021c) would allow for the investigation of housing insecurity as a mediator of depression, and other outcomes, from an Australian perspective. A further advantage is that

it would provide another avenue to identify DFV exposure as 42 per cent of clients seeking assistance from specialist homelessness services in Western Australia did so due to DFV (AIHW, 2019).

We found that, compared to non-exposed children, children exposed to DFV had a 52 per cent increased risk of having a mental health contact with no diagnosis recorded. This category captured children who were in MHIS data but had no diagnosis or had a mental health diagnosis in HMDC data or EDDC data. It is not clear from the data why this is the case; it may be for multiple reasons. The child may not engage in services to enable a diagnosis by clinicians. Additionally, the clinicians may be unaware of the DFV which prevents a full understanding of the child's environment impacting clinical diagnosis. As discussed previously the lack of classification for developmental trauma may result in an absence of diagnosis so the child may not receive appropriate support and care. Further investigation is needed to gain an understanding of potential barriers in the support and treatment of children exposed to DFV.

The focus on diagnosis is highlighted in the *National Children's Mental Health and Wellbeing Strategy* (Australian Government, 2021). The strategy proposes a cultural shift in the way that we think about the mental health and wellbeing of children – that is, a greater focus on a child's functioning rather than diagnosis. The strategy argues that funded services should be available for children at the point that they begin to struggle, rather than delaying services until the child is unwell and is given a diagnosis. The strategy highlighted that this approach aligned with the Aboriginal and Torres Strait Islander concept of emotional wellbeing.

Predictive characteristics for mental health service contact

Overall, the characteristics that increased the risk of mental health service contact for children exposed to DFV were similar to those of non-exposed children. However, significant differences were noted in maternal age and mother's mental health contact. For children exposed to DFV being born to a mother aged under 30 was associated with a reduced risk of mental health service contact. This reduction was not

observed in the non-exposed children. Additionally, having a mother with a mental health service contact was associated with a 34 per cent increased risk of mental health service contact for non-exposed children, but it did not increase the risk for children exposed to DFV. It is not clear from our data why this is the case. Our findings are in contrast to existing literature that found parental mental illness can increase the risk of mental illness for the child (Matijasevich et al., 2014; Reupert et al., 2013). However, it is accepted that the combination of DFV and maternal mental illness can disrupt parenting (Greene et al., 2018) which may reduce engagement in services for the child. Previous research has acknowledged the relationship between DFV and women's mental health is complex and bidirectional in nature, with both highly associated with each other (Mason & O'Rinn, 2014). This may make the association of maternal mental illness and children's mental illness harder to disentangle for families subjected to DFV. It should be noted that the reduction in risk for children exposed to DFV does not indicate that maternal mental illness or being born to a mother under 30 years are protective factors for mental health issues. Rather, these associations should be viewed as potential barriers that require further exploration.

Existing research is equivocal on whether sex impacts the mental health of children exposed to DFV (e.g. Sternberg et al., 2006). We found that, overall, sex had no impact on the risk of mental health service contact for children exposed to DFV. However, we did find differences in service use over time. Females exposed to DFV had lower probability of mental health service contact than their male counterparts between the age of 7 to 14. However, by the age of 15 years the probability of mental health service contact was similar for males and females. Our findings highlight the importance of investigating mental health service outcomes over an extended period. Without longitudinal research the association of characteristics on mental health for those exposed to DFV may be misinterpreted, impacting the ability to appropriately target services.

Differences in the sexes were noted in specific diagnosis subtypes. Being female increased the risk of personality disorder category in children exposed to DFV by 100 per cent and by 48 per cent in non-exposed children. Conversely, in the other mental illness-related contacts category higher

risk was seen in non-exposed females who had a 291 per cent increased risk whereas exposed female children had a 100 per cent increased risk. Exposure to trauma in childhood is thought to increase the risk of personality disorder (Porter et al., 2020; Sher et al., 2015). The association of sex with personality disorders is complex, and findings from existing research are equivocal (Schulte Holthausen & Habel, 2018). One reason for the inconsistency is thought to be the influence of gender stereotypes on clinicians' diagnosis of certain personality disorders (Crosby & Sprock, 2004; Schulte Holthausen & Habel, 2018). The higher risk of personality disorder seen in exposed females needs further investigation. It may be that there is greater bias in the diagnosis of personality disorder in females exposed to DFV due to gender stereotypes, or there may be some physiological underpinnings.

The findings on predictive characteristics support the proposal of ecological theory (Bronfenbrenner, 1977) that multiple variables influence a child's mental health (D'Andrea & Graham-Bermann, 2017). Importantly, not all children with highlighted characteristics, such as a mother with mental illness or those who were born to a mother under 30 years, had a mental health contact or mental health diagnosis. This supports the theory (Bronfenbrenner & Morris, 2007) that developmental processes are probabilistic, not deterministic.

Aboriginal and Torres Strait Islander children

Aboriginal and Torres Strait Islander children were overrepresented in our cohort with 62 per cent of children exposed to DFV being Aboriginal and Torres Strait Islander. This overrepresentation may be explained, in part, by high rates of DFV experienced by Aboriginal and Torres Strait Islander women, including mothers (ABS, 2016b; Orr, Preen et al., 2019). A further explanation for overrepresentation may be the source of our DFV identification: police and hospital data. Some studies suggest that the likelihood of being charged for DFV is increased by a variety of socioeconomic and demographic characteristics, such as Aboriginal status (Cunneen, 2010; Jeffries & Bond, 2015). Studies also show that Aboriginal and Torres Strait Islander women are more likely to be hospitalised for DFV than non-Aboriginal and Torres Strait Islander women (AIHW, 2006; Orr, Preen et

al., 2019). DFV is not consistent with traditional Aboriginal and Torres Strait Islander culture and the overrepresentation of Aboriginal and Torres Strait Islander children in this study should be understood in the context of the multiple disadvantages faced by Aboriginal and Torres Strait Islander peoples as a result of colonisation and not as an indicator of a racial determinant (Blagg et al., 2020; Our Watch, 2018). Additionally, Aboriginal and Torres Strait Islander women and children may be experiencing DFV perpetrated by non-Aboriginal and Torres Strait Islander people.

Similar to the full cohort, we found that for Aboriginal and Torres Strait Islander children who were exposed to DFV, having a mother with a mental health service contact reduced the risk of mental health service contact for the child. This was in contrast to the non-exposed children where an increase in service contact was noted. Findings from the *Western Australian Aboriginal Child Health Survey* (Zubrick et al., 2005) highlighted that Aboriginal children whose primary carer had used mental health services were more likely to have a mental health service use than those with a carer who had not used mental health services. However, the survey findings did not account for DFV exposure. Given the differences in mental health contact between children exposed to DFV and non-exposed children and the high rates of DFV in Aboriginal communities, future research investigating the mental health of Aboriginal and Torres Strait Islander children should consider the impact of DFV exposure.

Our findings suggest that co-occurring DFV and maternal mental illness is a barrier to mental health service use for children exposed to DFV. A potential explanation may be that Aboriginal and Torres Strait Islander families experiencing multiple issues such as DFV and maternal and child mental illness are wary of service engagement due to fear of child removal (O'Donnell et al., 2015).

Both Aboriginal and Torres Strait Islander children exposed and not exposed to DFV had an increased risk of mental health service contact if they lived in a major city. This increase was not consistent with the full cohort where being from a major city had no impact on the risk of mental health service contact for both exposed and non-exposed children. Additionally, for Aboriginal and Torres Strait Islander children not exposed

to DFV, living in a very remote location decreased their risk of mental health service contact by 16 per cent. However, for children exposed to DFV, being from a very remote area had no impact on the risk of mental health service contact. These findings cannot be taken to mean that children exposed to DFV out of the metropolitan area do not have as high a risk of mental illness – instead it may be due to the greater challenges in accessing mental health services outside the metropolitan area (National Mental Health Commission, 2018). Previous research (Cassells et al., 2014) has reported that the lack of culturally appropriate mental health services for Aboriginal and Torres Strait Islander children living in remote and isolated communities is a barrier to accessing and engaging in services. Our findings have implications for regional and remote resource needs and mental health service provision to support children exposed to DFV. The newly launched *Aboriginal Empowerment Strategy – Western Australia 2021–2029* (Government of Western Australia, 2021b) acknowledged the need for place-based partnership engagement. To ensure culturally responsive and secure services, services should be tailored to specific geographic areas to match local priorities and contexts, all while keeping Aboriginal culture at the forefront (Government of Western Australia, 2021b).

For Aboriginal and Torres Strait Islander children, exposure to DFV was associated with a significantly increased risk of intentional self-harm, which was not seen in non-exposed Aboriginal and Torres Strait Islander children but aligns with previous Australian research (Leckning et al., 2020). Self-harm is a major public health issue and is the leading cause of death in Australian children aged 5 to 17 (ABS, 2021b). The higher rates of intentional self-harm seen in Aboriginal and Torres Strait Islander children exposed to DFV have been attributed to the effects of intergenerational trauma stemming from the impacts of colonisation and Stolen Generation policies on family and community functioning (Dudgeon et al., 2017; Leckning et al., 2020). In addressing the high rates of intentional self-harm for Aboriginal and Torres Strait Islander children, the renewed Closing the Gap campaign (Commonwealth of Australia. Department of the Prime Minister and Cabinet, 2021) recognises the need for strategies to promote high levels of social and emotional wellbeing. For some Aboriginal and Torres Strait Islander children and families, mainstream, western concepts of

mental health do not directly translate into the more holistic framework of social and emotional wellbeing (Leckning et al., 2019). Aboriginal and Torres Strait Islander expertise in culturally appropriate service provision is needed to lead the way forward.

Our findings highlight the importance of Closing the Gap's Target 13 – “families and households are safe” – which aims to reduce all forms of DFV against Aboriginal and Torres Strait Islander women and children by at least 50 per cent by 2031 (Commonwealth of Australia. Department of the Prime Minister and Cabinet 2021). Characteristics such as residential remoteness and maternal mental health contact were found to impact mental health service use and diagnosis in Aboriginal and Torres Strait Islander children, and these characteristics are worthy of further research. Aboriginal and Torres Strait Islander communities are best positioned to identify specific research questions to better understand the impact DFV exposure has on children's mental health in their communities.

The Fourth National Action Plan of the National Plan to Reduce Violence against Women and their Children has prioritised support for Aboriginal women who are disproportionately exposed to DFV (Council of Australian Governments, 2019). There is a need for Aboriginal and Torres Strait Islander peoples to drive the development of multidisciplinary and multi-agency approaches that are both trauma informed and culturally appropriate for Aboriginal communities. To achieve this and to improve outcomes, government and service providers need to work in partnership with Aboriginal communities.

Children with disability

To date, the impact of DFV on children with disability is poorly understood (Dababnah et al., 2018; Robinson et al., 2020). Our findings suggest that DFV exposure may be a barrier to service access for children with disability. For children exposed to DFV, having disability was associated with a 41 per cent increased chance of having a mental health service contact – that is, less than half the risk seen in non-exposed children with disability. Children with disability face multiple barriers accessing health services in a timely manner

including cost, inadequate transportation, inaccessibility of buildings and discrimination by health professionals (AIHW, 2020b; VicHealth, 2012). For children exposed to DFV, the mother may not engage the child in mental health services for fear of child removal, since children with disability are more likely to have contact with child protection services and the out-of-home care system (Commonwealth of Australia, 2015; Hindmarsh et al., 2021). Further research is needed to gain a greater understanding of DFV exposure on mental health service access.

For children with disability who were exposed to DFV, being born pre-term (prior to 37 weeks gestation) was associated with an increased risk of mental health service contact. This increase was not observed in non-exposed peers. It is not clear from the data why pre-term birth is associated with an increased risk in children exposed to DFV. While our average age of exposure was 6.5 years, it is acknowledged that DFV can occur for many years before women report it or engage in services (Graham-Bermann & Perkins, 2010; Loxton et al., 2017). Therefore, it may be that some mothers were subjected to DFV while pregnant, which increases not only the risk of pre-term birth (Alhusen et al., 2015; Lipsky et al., 2003) but subsequent mental health issues for the child (Martinez-Torteya et al., 2015). Further research is required to gain a greater understanding of the association of pre-term birth and the mental health of children exposed to DFV, including the capture of DFV in pregnancy.

Strengths and limitations

Strengths

The main strength of the research was the use of population level administrative data, linked across multiple agencies, at both the child and parent level to investigate the mental health of children exposed to DFV. The use of linked police and hospital data to identify DFV exposure enabled investigations of high-risk groups not captured in previous mental health research. Researching DFV is a complex task. The intimate context of the phenomenon means the act is not observed and, in many cases, is unreported (Phillips & Vandenbroek, 2014). The stigma related to the issue and the safety risk to the mothers and children also account for a high rate of non-responses within existing DFV research (Ruiz-Pérez et

al., 2007). Identifying and researching children's exposure to DFV is further complicated by maternal fear that their child may be removed if they disclose (Wilson et al., 2017). Due to these complexities, research related to children exposed to DFV is predominately based on small samples of children involved in specialist services, representing a subsection of those exposed. The use of the Western Australian Data Linkage System ensured that ethical and privacy standards were upheld and facilitated the ability to identify DFV and outcomes of a hidden population. The availability of dates of DFV events and outcome events allowed longitudinal follow-up. Additionally, the linked population data provided a wealth of information on multiple ecological factors at the child, parent and community level, enabling multivariate analysis when investigating the mental health of children exposed to DFV. The use of linked administrative data eliminated recall bias, reporting bias and loss-to-follow-up seen in existing literature.

As we had no information on the lived experiences of the children or families included in the study, our research was further strengthened by the community and consumer reference groups who aided interpretation of the findings.

Limitations

While the use of linked administrative data provides many advantages, there are some limitations that should be noted. While most violence against women is perpetrated by a current or former male intimate partner, it should be acknowledged that the DFV in some cases identified in the hospital data may have been perpetrated by someone other than a male intimate partner. DFV classification in hospital data is overly complex and needs to be streamlined to better capture the experiences of women.

Aboriginal and Torres Strait Islander children were overrepresented in our research cohort. This could be, in part, due to the police records of DFV requiring a charge to be made against the man; there is evidence to suggest that the likelihood of being charged for DFV is increased by a variety of socioeconomic and demographic characteristics, such as Aboriginal status (Australian Law Reform Commission, 2018; Cunneen, 2010; Jeffries & Bond, 2015). Despite a call-out occurring, on average, every 10 minutes in Western Australia

for DFV, our exposed cohort comprised 5,736 mothers over five years. This equates to the number of call-outs police receive in 40 days. Therefore, our data are an underestimation of DFV and not generalisable to women who are victims of DFV where a man is not charged with an offence.

The children identified as exposed to DFV in this report were only recognised because of the mother's involvement in police or hospital services. As such, the data may be subject to selection bias, capturing mainly the more physical cases of DFV, and may underestimate the impact of DFV exposure on children's mental health outcomes due to the fact that not all children exposed to DFV were captured. It is therefore likely that the estimates presented in this report are conservative estimates of the association between DFV and the mental health of children exposed to DFV. Furthermore, it was assumed that the children exposed to DFV resided with their mother, but this may not be the case for all children captured.

Additionally, while rich data are made available from administrative datasets, the datasets provided no or limited data in relation to family functioning, family structure and social support. As such, there are likely to be a number of unmeasured characteristics that would have influenced outcomes for the child.

While the identification of disability was based on categories used in previous research (Maclean, Sims et al., 2017), the capture of disability is limited. Individuals differ on how they define their disability status and our definition does not take into account the complex and multidimensional nature of disability. Also, our definition is limited in its scope as it does not capture chronic health conditions such as asthma, epilepsy or permanent injuries which some of the literature includes in its disability categories.

Our capture of mental illness in children was identified by public and private hospitalisations and ED attendance, and public outpatient mental health services. Many children with mental illness will not be identified in these data. The most recent *Australian Child and Adolescent Survey of Mental Health and Wellbeing* (Lawrence et al., 2015, p. 6) highlighted that only 6 per cent of children (4 to 17 years) with a mental health disorder had attended hospital or an emergency department for their mental health in the past 12 months.

Furthermore, the survey highlighted that only 3 per cent of children (4 to 17 years) with mental illness had attended outpatient mental health services in the previous 12 months (Lawrence et al., 2015, p. 6). However, the survey found that 42 per cent of children had seen their GP for mental illness in the previous 12 months. Therefore, our identification of service use and diagnosis for children exposed to DFV is underestimated. Additionally, the findings of our results may not reflect those of children who have mental illness and use other services.

Distribution of categories within the cohort demographic characteristics varied. However, this was accounted for in the multivariable analysis employed from which the findings are reported. Finally, as an observational study, the results of the research contained in this report highlight an association, and do not indicate causality between DFV exposure and the development of mental illness.

Directions for future research

This report highlighted that there is a substantial period of time between children's exposure to DFV and their contact with mental health services. Early access to mental health services is important for children as it can reduce the long-term impact of mental illness (MacDonald et al., 2018). It is imperative to ensure improved mental health outcomes for children exposed to DFV that research to understand factors associated with delay in service contact is undertaken as a priority. It is equally imperative that the results provide evidence to ensure the availability of adequate and appropriate services which can be accessed in a timely manner.

This report details the mental health service use and diagnosis of children exposed to DFV. It is acknowledged that children with mental health issues are more likely to have mental health issues in adulthood (Kessler, 2005; Ravens-Sieberer et al., 2015). Future research is needed to investigate the mental health of the children exposed to DFV into their adulthood. Additionally, further research is needed on the transition of care, for children exposed to DFV, from children's mental health services to adult services. This transition period is often poorly managed (Crowley et al., 2011) with continuity of care disruption increasing disengagement from services

(Singh, 2009). As young people with complex needs are at greater risk of “falling through the gaps” in care transition (Singh, 2009), attention to those exposed to DFV is needed.

Further research is required utilising multiple sources of linked data to identify both DFV and mental illness. Data sources such as the Australian Specialist Homelessness Services Collection (AIHW, 2021c), primary care general practice data, prescription data, school nurse data and private mental health outpatient services are required to gain a greater understanding of the effects of exposure to DFV on children’s mental health. The linked data should be complemented by combining data from population-based surveys, longitudinal surveys and social indicators (Hertzman & Williams, 2009). This multiple source approach would largely overcome the limitations of using each source separately and benefit from the strengths of each.

There is a need for research driven by Aboriginal and Torres Strait Islander peoples on the mental health of Aboriginal and Torres Strait Islander children given their disproportionate exposure to DFV. The findings contained in this report have the potential to be a stepping stone from which a holistic, culturally appropriate program of research can be developed.

We were unable to investigate the mental health service use of children born to CALD parents. Given that Australia continues to settle immigrants and those fleeing persecution and violence, having insufficient data available to undertake robust research to understand mental health outcomes and appropriate interventions in these populations is worrying. Ensuring that government and not-for-profit agencies routinely collect this data and make it available for research purposes is pivotal in enabling the urgently needed research.

Implications for policy and practice

1. Our research has shown that DFV exposure is associated with an increased risk of mental health service contact and diagnosis of mental illness. Early intervention is required. Many children exposed to DFV are not engaged in mental health services until years after the exposure. Our findings provide further support for the *National Children’s Mental Health and Wellbeing Strategy* (Australian Government, 2021) in that funded services should be available for children at the point that they begin to struggle, rather than services being delayed until the child is unwell and given a diagnosis. Our findings also add further support for the need for a dedicated standalone national response and matching actions strategy for the mental health of children exposed to DFV (Australian Government, 2021).
2. Children exposed to DFV often live with complex issues such as maternal mental illness and disability. Services to support children exposed to DFV must be well resourced and holistically focused with collaborative, multidisciplinary teams and cross-agency collaboration that provides continuity of care for children and their families with multiple and complex issues.
3. It is important that mental health clinicians are aware of trauma, including DFV exposure, during childhood. Clinicians need to have knowledge of DFV and its implications for mental health as well as the ability to appropriately and safely respond to children exposed to DFV (McTavish et al., 2016). These skills need to be taught to clinicians during their training and offered as ongoing professional development to enable clinicians to stay abreast of contemporary developments. At present DFV training is not part of the mandatory suite of training across Western Australian health services. A national approach should be taken to ensure that all registered and non-registered staff within public, private and NGO health services are provided with DFV training.
4. Aboriginal and Torres Strait Islander peoples should be provided with the opportunity and resources to develop policies and programs to support Aboriginal and Torres Strait Islander children who experience exposure to DFV.
5. Children and their families subjected to DFV are in contact with multiple agencies that may include education, health, police and child protection, and each agency provides a potential point of intervention. As such, it is imperative that these agencies, along with children’s mental health services, are embedded in, and part of, a broader collaborative, multiagency and multidisciplinary response to DFV; they need to be adapted to “fit” with the existing local response to DFV and to avoid unwarranted duplication of services.
6. To support service engagement and reduce the re-traumatisation of children exposed to DFV, service

responses must be trauma informed and culturally responsive and secure.

7. Exposure to DFV is associated with an increased risk of mental health disorders in children. Our findings highlight the importance of the continuation of collective prevention efforts nationally and in each jurisdiction to reduce and eradicate DFV.

Conclusion

This study was undertaken to gain an understanding of the mental health service contact and diagnosis categories of children exposed to DFV. Using linked administrative data has enabled us to investigate a population that is often hidden. Children's exposure to DFV is associated with an increased risk of mental health service use and mental health diagnosis in childhood. There are sociodemographic characteristics that appear to be factors associated with children exposed to DFV accessing mental health services including being born to a mother under 30 and a mother with mental illness. Additionally, many children are not accessing mental health services until several years after their exposure. These findings highlight the need for targeted government funding for early intervention mental health services for children exposed to DFV. Intervention strategies should be underpinned by a public health approach and include multidisciplinary, multi-agency approaches that are trauma-informed. Aboriginal and Torres Strait Islander children are overrepresented in our exposed cohort. This provides further evidence for the need to have culturally appropriate services led by and tailored for Aboriginal and Torres Strait Islander peoples.

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Legislation

Children and Community Services Act 2004 (WA).

Family Law Act 1975 (Cth).

Restraining Orders Act 1997 (WA).

APPENDIX A:

Australian and New Zealand Standard Offence Classification codes used to categorise DFV

Description	Classification code
Murder	0111
Attempted murder	0121
Assault and injury	0211, 0212, 0213, 0299
Sexual assault	0311, 0312
Threatening behaviour	0532
Misuse of weapons	1122

Source: Australian Bureau of Statistics. (2011). *Australian and New Zealand Standard Offence Classification (ANZSOC)*. <https://www.abs.gov.au/ausstats/abs@.nsf/mf/1234.0>

APPENDIX B:

The association of DFV exposure on the risk (adjusted hazard ratios) of childhood mental health diagnosis by subcategory

The tables below provide the adjusted hazard ratios and 95 per cent confidence intervals (CIs) for the risk associated with DFV exposure on specific mental health diagnosis groups (relating to Figure 2 in the report). Individual models were run for each group. Adjustments were made for Aboriginal and Torres Strait Islander status, sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness, disability and maternal mental health contact. Bolded text in tables denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Mental health contact with no diagnosis recorded	
	Adjusted hazard ratio (95% CI)
DFV exposure	
Yes	1.52 (1.42, 1.62)
No	Reference group

Other mental illness-related contacts	
	Adjusted hazard ratio (95% CI)
DFV exposure	
Yes	1.21 (0.94, 1.56)
No	Reference group

Intentional self-harm	
	Adjusted hazard ratio (95% CI)
DFV exposure	
Yes	1.59 (1.30, 1.96)
No	Reference group

Substance use disorder	
	Adjusted hazard ratio (95% CI)
DFV exposure	
Yes	1.99 (1.66, 2.38)
No	Reference group

Psychological development disorder		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.19 (1.06, 1.33)
	No	Reference group

Depressive disorder		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.36 (1.11, 1.66)
	No	Reference group

Anxiety disorder		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.49 (1.37, 1.63)
	No	Reference group

Schizophrenia and psychoses		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.39 (1.19, 1.63)
	No	Reference group

Personality disorder		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.76 (1.18, 2.61)
	No	Reference group

Organic disorder		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.41 (0.97, 2.04)
	No	Reference group

APPENDIX C:

The association of sociodemographic characteristics on the risk of childhood mental health diagnosis by subcategory in children exposed to DFV and not exposed to DFV

Anxiety disorder

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	0.98 (0.84, 1.14)	1.09 (0.96, 1.25)
No	Reference group	Reference group
Sex		
Female	1.36 (1.20, 1.55)^c	1.48 (1.33, 1.65)
Male	Reference group	Reference group
Preterm		
<37 weeks	0.94 (0.77, 1.14)	1.02 (0.85, 1.22)
≥37 weeks	Reference group	Reference group
Mother's age at birth		
<20 years	0.77 (0.61, 0.98)	0.99 (0.80, 1.24)
20–29 years	0.77 (0.63, 0.93)	0.99 (0.85, 1.15)
30–39 years	Reference group	Reference group
40+ years	1.79 (0.93, 3.42)	1.42 (0.91, 2.21)
Father's age at birth		
<20 years	1.08 (0.79, 1.48)	1.25 (0.94, 1.67)
20–29 years	1.16 (0.96, 1.41)	1.11 (0.95, 1.29)
30–39 years	Reference group	Reference group
40+ years	0.99 (0.68, 1.45)	1.25 (0.98, 1.59)
Missing age	1.25 (1.00, 1.55)	1.21 (0.99, 1.48)
Maternal marital status at birth		
Never married	1.06 (0.91, 1.23)	1.30 (1.12, 1.50)

Characteristic		DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
	Divorced/separated	1.02 (0.66, 1.56)	1.63 (1.11, 2.39)
	Unknown/not stated	1.22 (0.54, 2.73)	2.07 (1.10, 3.87)
	Married/de facto/widowed	Reference group	Reference group
Socioeconomic status			
	1-Most disadvantaged	0.78 (0.56, 1.07)	1.14 (0.84, 1.55)
	2	0.82 (0.59, 1.14)	1.06 (0.78, 1.46)
	3	0.86 (0.61, 1.21)	1.02 (0.74, 1.42)
	4	0.80 (0.55, 1.17)	0.92 (0.65, 1.32)
	5-Least disadvantaged	Reference group	Reference group
Residential remoteness			
	Major cities	1.19 (0.94, 1.50)	1.04 (0.87, 1.26)
	Outer regional	0.81 (0.61, 1.08)	0.86 (0.69, 1.07)
	Remote	0.91 (0.68, 1.22)	0.84 (0.66, 1.06)
	Very remote	0.78 (0.59, 1.04)	0.79 (0.62, 1.00)
	Inner regional	Reference group	Reference group
Maternal mental health contact^b			
	Yes	1.14 (1.00, 1.30)	1.59 (1.42, 1.79)
	No	Reference group	Reference group
Child has disability			
	Yes	1.31 (1.11, 1.54)	1.61 (1.39, 1.86)
	No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Psychological development disorder

Characteristic		DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and or Torres Strait Islander			
Yes		0.88 (0.72, 1.07)	1.04 (0.90, 1.22)
No		Reference group	Reference group
Sex			
Female		0.77 (0.65, 0.91)^c	0.61 (0.54, 0.70)
Male		Reference group	Reference group
Preterm			
<37 weeks		1.35 (1.08, 1.69)	1.02 (0.84, 1.25)
≥37 weeks		Reference group	Reference group
Mother's age at birth			
<20 years		0.83 (0.60, 1.14)	1.21 (0.95, 1.55)
20–29 years		0.98 (0.75, 1.26)	0.93 (0.78, 1.10)
30–39 years		Reference group	Reference group
40+ years		1.43 (0.62, 3.30)	1.94 (1.29, 2.93)
Father's age at birth			
< 20 years		1.17 (0.77, 1.79)	0.93 (0.66, 1.31)
20–29 years		1.31 (1.01, 1.71)	1.06 (0.89, 1.26)
30–39 years		Reference group	Reference group
40+ years		1.45 (0.92, 2.28)	1.15 (0.88, 1.50)
Missing age		1.45 (1.08, 1.94)	1.17 (0.93, 1.47)
Maternal marital status at birth			
Never married		1.04 (0.86, 1.27)	1.18 (0.99, 1.40)
Divorced/separated		0.76 (0.40, 1.42)	1.89 (1.27, 2.82)
Unknown/not stated		1.69 (0.75, 3.80)	2.06 (1.06, 4.00)
Married/de facto/widowed		Reference group	Reference group
Socioeconomic status			
1–Most disadvantaged		0.87 (0.57, 1.33)	1.64 (1.10, 2.46)
2		0.87 (0.56, 1.34)	1.57 (1.04, 2.36)
3		0.83 (0.53, 1.31)	1.34 (0.87, 2.04)
4		0.82 (0.50, 1.36)	1.33 (0.85, 2.08)
5–Least disadvantaged		Reference group	Reference group

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Residential remoteness		
Major cities	1.48 (1.06, 2.05)	1.28 (1.02, 1.60)
Outer regional	1.15 (0.78, 1.69)	0.99 (0.76, 1.29)
Remote	1.20 (0.80, 1.80)	0.92 (0.69, 1.22)
Very remote	0.75 (0.50, 1.12)	0.95 (0.71, 1.27)
Inner regional	Reference group	Reference group
Maternal mental health contact^b		
Yes	0.99 (0.84, 1.17)	1.36 (1.18, 1.56)
No	Reference group	Reference group
Child has disability		
Yes	2.67 (2.23, 3.20)	3.28 (2.86, 3.76)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Depressive disorder

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	0.78 (0.55, 1.12)	1.02 (0.77, 1.35)
No	Reference group	Reference group
Sex		
Female	2.83 (2.04, 3.94)^c	2.81 (2.16, 3.66)
Male	Reference group	Reference group
Preterm		
<37 weeks	1.13 (0.73, 1.74)	0.74 (0.46, 1.18)
≥37 weeks	Reference group	Reference group
Mother's age at birth		
<20 years	1.19 (0.66, 2.13)	1.06 (0.65, 1.71)
20–29 years	1.11 (0.68, 1.82)	1.02 (0.73, 1.41)
30–39 years	Reference group	Reference group
40+ years	1.18 (0.16, 8.87)	1.75 (0.68, 4.47)

Father's age at birth		
<20 years	0.88 (0.43, 1.80)	1.08 (0.54, 2.14)
20–29 years	0.99 (0.63, 1.56)	1.29 (0.93, 1.79)
30–39 years	Reference group	Reference group
40+ years	1.80 (0.84, 3.85)	1.41 (0.83, 2.37)
Missing age	1.06 (0.63, 1.78)	1.31 (0.83, 2.06)
Maternal marital status at birth		
Never married	1.10 (0.78, 1.55)	1.06 (0.76, 1.48)
Divorced/separated	0.28 (0.04, 2.01)	1.76 (0.77, 4.03)
Unknown/not stated	Count too small	2.16 (0.53, 8.81)
Married/de facto/widowed	Reference group	Reference group
Socioeconomic status		
1–Most disadvantaged	1.05 (0.48, 2.32)	1.72 (0.75, 3.96)
2	1.09 (0.48, 2.44)	1.86 (0.80, 4.31)
3	0.83 (0.35, 1.98)	1.61 (0.67, 3.84)
4	0.62 (0.22, 1.71)	1.82 (0.74, 4.45)
5–Least disadvantaged	Reference group	Reference group
Residential remoteness		
Major cities	1.06 (0.63, 1.80)	1.03 (0.68, 1.56)
Outer regional	0.89 (0.47, 1.67)	1.36 (0.87, 2.13)
Remote	0.92 (0.47, 1.80)	0.91 (0.54, 1.53)
Very remote	0.79 (0.42, 1.50)	0.62 (0.35, 1.09)
Inner regional	Reference group	Reference group
Maternal mental health contact ^b		
Yes	1.14 (0.84, 1.54)	1.42 (1.09, 1.84)
No	Reference group	Reference group
Child has disability		
Yes	1.72 (1.20, 2.46)	1.11 (0.77, 1.60)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Mental health contact with no diagnosis recorded

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	1.08 (0.96, 1.22)	1.27 (1.15, 1.40)^c
No	Reference group	Reference group
Sex		
Female	0.84 (0.77, 0.92)	0.83 (0.77, 0.90)
Male	Reference group	Reference group
Preterm		
<37 weeks	1.19 (1.04, 1.36)	1.16 (1.02, 1.31)
≥37 weeks	Reference group	Reference group
Mother's age at birth		
<20 years	0.83 (0.69, 0.98)	1.26 (1.08, 1.47)
20–29 years	0.79 (0.69, 0.92)	1.05 (0.94, 1.17)
30–39 years	Reference group	Reference group
40+ years	1.17 (0.65, 2.09)	1.09 (0.76, 1.55)
Father's age at birth		
<20 years	1.08 (0.87, 1.36)	1.05 (0.86, 1.29)
20–29 years	1.07 (0.92, 1.24)	1.01 (0.91, 1.13)
30–39 years	Reference group	Reference group
40+ years	1.19 (0.91, 1.54)	1.32 (1.11, 1.56)
Missing age	1.05 (0.89, 1.24)	1.17 (1.01, 1.34)
Maternal marital status at birth		
Never married	1.02 (0.91, 1.14)	1.14 (1.02, 1.26)
Divorced/separated	1.36 (1.01, 1.83)	1.51 (1.12, 2.03)
Unknown/not stated	1.89 (1.20, 2.98)	1.85 (1.17, 2.91)
Married/de facto/widowed	Reference group	Reference group
Socioeconomic status		
1–Most disadvantaged	1.04 (0.79, 1.38)	1.77 (1.34, 2.35)
2	1.01 (0.75, 1.35)	1.77 (1.33, 2.36)
3	1.27 (0.95, 1.70)	1.74 (1.30, 2.34)
4	1.10 (0.80, 1.52)	1.73 (1.27, 2.35)
5–Least disadvantaged	Reference group	Reference group

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Residential remoteness		
Major cities	0.92 (0.77, 1.10)	0.93 (0.81, 1.07)
Outer regional	1.07 (0.88, 1.32)	1.02 (0.87, 1.19)
Remote	1.21 (0.98, 1.49)	1.23 (1.05, 1.44)
Very remote	0.99 (0.81, 1.21)	0.94 (0.79, 1.11)
Inner regional	Reference group	Reference group
Maternal mental health contact^b		
Yes	0.91 (0.82, 1.00)	1.23 (1.13, 1.35)
No	Reference group	Reference group
Child has disability		
Yes	1.02 (0.89, 1.16)	1.52 (1.37, 1.69)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Other mental illness-related contacts

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	0.72 (0.45, 1.17)	0.58 (0.32, 1.08)
No	Reference group	Reference group
Sex		
Female	2.00 (1.33, 3.00)^c	3.91 (2.11, 7.25)
Male	Reference group	Reference group
Preterm		
<37 weeks	1.14 (0.66, 1.97)	1.31 (0.59, 2.92)
≥37 weeks	Reference group	Reference group
Mother's age at birth		
<20 years	0.98 (0.47, 2.04)	0.18 (0.05, 0.65)
20–29 years	0.97 (0.53, 1.76)	0.83 (0.43, 1.61)
30–39 years	Reference group	Reference group
40+ years	1.56 (0.20, 12.03)	Count too small

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Father's age at birth		
<20 years	0.30 (0.06, 1.38)	2.82 (0.66, 11.93)
20–29 years	1.21 (0.66, 2.20)	1.30 (0.65, 2.61)
30–39 years	Reference group	Reference group
40+ years	1.99 (0.76, 5.17)	Count too small
Missing age	1.55 (0.79, 3.04)	2.28 (0.96, 5.45)
Maternal marital status at birth		
Never married	0.80 (0.50, 1.30)	2.26 (1.18, 4.31)
Divorced/separated	Count too small	Count too small
Unknown/not stated	3.61 (0.87, 14.94)	Count too small
Married/de facto/widowed	Reference group	Reference group
Socioeconomic status		
1–Most disadvantaged	1.44 (0.44, 4.75)	0.93 (0.27, 3.19)
2	1.36 (0.40, 4.62)	0.94 (0.27, 3.30)
3	0.96 (0.26, 3.53)	0.64 (0.16, 2.59)
4	1.87 (0.51, 6.82)	0.70 (0.16, 3.13)
5–Least disadvantaged	Reference group	Reference group
Residential remoteness		
Major cities	1.34 (0.60, 3.00)	1.90 (0.67, 5.39)
Outer regional	1.85 (0.77, 4.42)	1.55 (0.48, 4.97)
Remote	1.47 (0.57, 3.80)	1.33 (0.37, 4.81)
Very remote	1.04 (0.41, 2.63)	0.63 (0.14, 2.95)
Inner regional	Reference group	Reference group
Maternal mental health contact^b		
Yes	1.03 (0.69, 1.53)	2.23 (1.30, 3.82)
No	Reference group	Reference group
Child has disability		
Yes	2.49 (1.62, 3.84)	0.85 (0.36, 1.98)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Intentional self-harm

Characteristic		DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander			
	Yes	1.36 (0.95, 1.96)	1.17 (0.86, 1.60)
	No	Reference group	Reference group
Sex			
	Female	2.81 (2.05, 3.87)^c	3.20 (2.39, 4.28)
	Male	Reference group	Reference group
Preterm			
	<37 weeks	0.84 (0.54, 1.32)	0.81 (0.51, 1.30)
	≥37 weeks	Reference group	Reference group
Mother's age at birth			
	<20 years	0.56 (0.33, 0.95)	0.78 (0.48, 1.27)
	20–29 years	0.68 (0.44, 1.06)	0.77 (0.54, 1.08)
	30–39 years	Reference group	Reference group
	40+ years	1.22 (0.16, 9.05)	2.10 (0.74, 5.93)
Father's age at birth			
	<20 years	1.78 (0.87, 3.62)	1.09 (0.52, 2.29)
	20–29 years	1.57 (0.95, 2.58)	1.34 (0.94, 1.91)
	30–39 years	Reference group	Reference group
	40+ years	1.43 (0.58, 3.56)	0.61 (0.29, 1.29)
	Missing age	1.89 (1.12, 3.22)	1.71 (1.09, 2.69)
Maternal marital status at birth			
	Never married	1.29 (0.93, 1.78)	1.10 (0.78, 1.56)
	Divorced/separated	0.77 (0.24, 2.45)	0.91 (0.29, 2.90)
	Unknown/not stated	Count too small	1.09 (0.15, 7.84)
	Married/de facto/widowed	Reference group	Reference group
Socioeconomic status			
	1–Most disadvantaged	1.53 (0.55, 4.22)	1.03 (0.49, 2.16)
	2	1.62 (0.58, 4.58)	1.08 (0.51, 2.28)
	3	2.00 (0.70, 5.71)	0.86 (0.39, 1.92)
	4	1.18 (0.36, 3.85)	0.98 (0.43, 2.27)
	5–Least disadvantaged	Reference group	Reference group

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Residential remoteness		
Major cities	0.85 (0.52, 1.40)	0.76 (0.50, 1.16)
Outer regional	0.48 (0.25, 0.93)	0.96 (0.60, 1.53)
Remote	0.79 (0.43, 1.44)	0.67 (0.39, 1.14)
Very remote	0.62 (0.35, 1.11)	0.78 (0.47, 1.30)
Inner regional	Reference group	Reference group
Maternal mental health contact^b		
Yes	1.07 (0.80, 1.44)	1.42 (1.07, 1.87)
No	Reference group	Reference group
Child has disability		
Yes	1.55 (1.09, 2.21)	1.03 (0.69, 1.54)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Substance use disorder

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	2.92 (2.05, 4.16)^c	4.59 (3.13, 6.75)
No	Reference group	Reference group
Sex		
Female	1.10 (0.86, 1.40)	0.83 (0.64, 1.06)
Male	Reference group	Reference group
Preterm		
<37 weeks	1.14 (0.82, 1.59)	1.21 (0.84, 1.74)
≥37 weeks	Reference group	Reference group
Mother's age at birth		
<20 years	1.29 (0.81, 2.05)	0.95 (0.60, 1.50)
20–29 years	1.04 (0.69, 1.57)	0.89 (0.62, 1.27)
30–39 years	Reference group	Reference group

Characteristic		DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
	40+ years	1.00 (0.14, 7.38)	0.97 (0.23, 4.10)
Father's age at birth			
	<20 years	0.89 (0.51, 1.57)	0.87 (0.44, 1.70)
	20–29 years	0.76 (0.51, 1.15)	1.11 (0.76, 1.61)
	30–39 years	Reference group	Reference group
	40+ years	1.29 (0.62, 2.70)	1.10 (0.55, 2.20)
	Missing age	1.37 (0.91, 2.08)	1.79 (1.18, 2.71)
Maternal marital status at birth			
	Never married	0.99 (0.75, 1.30)	1.22 (0.90, 1.65)
	Divorced/separated	0.75 (0.27, 2.03)	0.78 (0.25, 2.47)
	Unknown/not stated	0.83 (0.12, 5.94)	3.63 (1.33, 9.89)
	Married/de facto/widowed	Reference group	Reference group
Socioeconomic status			
	1–Most disadvantaged	1.08 (0.52, 2.23)	0.80 (0.40, 1.59)
	2	0.78 (0.36, 1.67)	0.43 (0.20, 0.91)
	3	0.83 (0.38, 1.84)	0.52 (0.24, 1.14)
	4	1.11 (0.47, 2.60)	0.91 (0.41, 2.00)
	5–Least disadvantaged	Reference group	Reference group
Residential remoteness			
	Major cities	1.17 (0.73, 1.87)	0.94 (0.60, 1.45)
	Outer regional	0.78 (0.45, 1.35)	0.73 (0.44, 1.20)
	Remote	0.78 (0.45, 1.36)	0.58 (0.34, 0.99)
	Very remote	0.59 (0.35, 0.99)	0.64 (0.39, 1.06)
	Inner regional	Reference group	Reference group
Maternal mental health contact^b			
	Yes	0.86 (0.67, 1.10)	1.28 (0.98, 1.67)
	No	Reference group	Reference group
Child has disability			
	Yes	1.80 (1.37, 2.38)	1.75 (1.28, 2.38)
	No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Schizophrenia and psychoses

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	0.98 (0.74, 1.29)	1.26 (1.00, 1.57)
No	Reference group	Reference group
Sex		
Female	1.95 (1.54, 2.48)^c	2.08 (1.72, 2.53)
Male	Reference group	Reference group
Preterm		
<37 weeks	0.98 (0.69, 1.39)	0.59 (0.40, 0.87)
≥37 weeks	Reference group	Reference group
Mother's age at birth		
<20 years	1.51 (0.94, 2.41)	0.94 (0.65, 1.36)
20–29 years	1.34 (0.89, 2.02)	0.95 (0.73, 1.22)
30–39 years	Reference group	Reference group
40+ years	1.88 (0.44, 7.94)	1.51 (0.69, 3.30)
Father's age at birth		
<20 years	0.98 (0.57, 1.67)	1.08 (0.64, 1.81)
20–29 years	0.98 (0.69, 1.41)	1.12 (0.87, 1.45)
30–39 years	Reference group	Reference group
40+ years	1.64 (0.86, 3.14)	1.23 (0.80, 1.87)
Missing age	1.22 (0.81, 1.82)	1.41 (1.01, 1.98)
Maternal marital status at birth		
Never married	1.06 (0.82, 1.38)	1.08 (0.83, 1.39)
Divorced/separated	0.53 (0.17, 1.67)	1.50 (0.77, 2.95)
Unknown/not stated	1.63 (0.40, 6.60)	2.58 (0.95, 6.98)
Married/de facto/widowed	Reference group	Reference group
Socioeconomic status		
1–Most disadvantaged	1.06 (0.57, 1.99)	1.41 (0.78, 2.56)
2	0.96 (0.50, 1.84)	1.47 (0.80, 2.68)
3	0.85 (0.43, 1.68)	1.19 (0.63, 2.24)
4	0.63 (0.28, 1.41)	1.41 (0.73, 2.71)
5–Least disadvantaged	Reference group	Reference group

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Residential remoteness		
Major cities	1.06 (0.71, 1.60)	1.12 (0.80, 1.57)
Outer regional	0.84 (0.51, 1.37)	1.32 (0.91, 1.90)
Remote	0.89 (0.54, 1.48)	0.89 (0.59, 1.34)
Very remote	0.70 (0.43, 1.13)	0.75 (0.49, 1.15)
Inner regional	Reference group	Reference group
Maternal mental health contact^b		
Yes	0.92 (0.73, 1.17)	1.44 (1.17, 1.76)
No	Reference group	Reference group
Child has disability		
Yes	1.53 (1.16, 2.03)	1.27 (0.97, 1.66)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Personality disorder

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	0.72 (0.45, 1.17)	1.09 (0.96, 1.25)
No	Reference group	Reference group
Sex		
Female	2.00 (1.33, 3.00)^c	1.48 (1.33, 1.65)
Male	Reference group	Reference group
Preterm		
<37 weeks	1.14 (0.66, 1.97)	1.02 (0.85, 1.22)
≥37 weeks	Reference group	Reference group
Mother's age at birth		
<20 years	0.98 (0.47, 2.04)	0.99 (0.80, 1.24)
20–29 years	0.97 (0.53, 1.76)	0.99 (0.85, 1.15)
30–39 years	Reference group	Reference group
40+ years	1.56 (0.20, 12.03)	1.42 (0.91, 2.21)

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Father's age at birth		
<20 years	0.30 (0.06, 1.38)	1.25 (0.94, 1.67)
20–29 years	1.21 (0.66, 2.20)	1.11 (0.95, 1.29)
30–39 years	Reference group	Reference group
40+ years	1.99 (0.76, 5.17)	1.25 (0.98, 1.59)
Missing age	1.55 (0.79, 3.04)	1.21 (0.99, 1.48)
Maternal marital status at birth		
Never married	0.80 (0.50, 1.30)	1.30 (1.12, 1.50)
Divorced/separated	Count too small	1.63 (1.11, 2.39)
Unknown/not stated	3.61 (0.87, 14.94)	2.07 (1.10, 3.87)
Married/de facto/widowed	Reference group	Reference group
Socioeconomic status		
1–Most disadvantaged	1.44 (0.44, 4.75)	1.14 (0.84, 1.55)
2	1.36 (0.40, 4.62)	1.06 (0.78, 1.46)
3	0.96 (0.26, 3.53)	1.02 (0.74, 1.42)
4	1.87 (0.51, 6.82)	0.92 (0.65, 1.32)
5–Least disadvantaged	Reference group	Reference group
Residential remoteness		
Major cities	1.34 (0.60, 3.00)	1.04 (0.87, 1.26)
Outer regional	1.85 (0.77, 4.42)	0.86 (0.69, 1.07)
Remote	1.47 (0.57, 3.80)	0.84 (0.66, 1.06)
Very remote	1.04 (0.41, 2.63)	0.79 (0.62, 1.00)
Inner regional	Reference group	Reference group
Maternal mental health contact^b		
Yes	1.03 (0.69, 1.53)	1.59 (1.42, 1.79)
No	Reference group	Reference group
Child has disability		
Yes	2.49 (1.62, 3.84)	1.61 (1.39, 1.86)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Organic disorder

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Aboriginal and/or Torres Strait Islander		
Yes	1.36 (0.71, 2.60)	0.88 (0.53, 1.47)
No	Reference group	Reference group
Sex		
Female	0.59 (0.33, 1.05)	0.50 (0.32, 0.79)
Male	Reference group	Reference group
Preterm		
<37 weeks	0.93 (0.41, 2.09)	0.72 (0.31, 1.66)
≥37 weeks	Reference group	Reference group
Mother's age at birth		
<20 years	0.42 (0.16, 1.13)	2.30 (0.91, 5.82)
20–29 years	0.58 (0.28, 1.21)	1.93 (1.04, 3.59)^c
30–39 years	Reference group	Reference group
40+ years	Count too small	3.65 (0.78, 17.03)
Father's age at birth		
<20 years	0.94 (0.22, 3.98)	0.87 (0.28, 2.74)
20–29 years	1.01 (0.45, 2.29)	0.89 (0.52, 1.51)
30–39 years	Reference group	Reference group
40+ years	0.96 (0.21, 4.37)	0.50 (0.14, 1.78)
Missing age	1.55 (0.65, 3.71)	0.60 (0.23, 1.52)
Maternal marital status at birth		
Never married	1.06 (0.56, 2.02)	0.81 (0.42, 1.57)
Divorced/separated	1.28 (0.30, 5.47)	1.98 (0.48, 8.27)
Unknown/not stated	Count too small	Count too small
Married/de facto/widowed	Reference group	Reference group
Socioeconomic status		
1–Most disadvantaged	0.76 (0.22, 2.61)	1.54 (0.36, 6.56)
2	0.52 (0.14, 1.97)	2.01 (0.47, 8.58)
3	0.68 (0.18, 2.67)	1.44 (0.32, 6.56)
4	0.88 (0.21, 3.70)	2.17 (0.47, 9.95)
5–Least disadvantaged	Reference group	Reference group

Characteristic	DFV exposure adjusted hazard ratios ^a (95% CI)	No DFV exposure adjusted hazard ratios ^a (95% CI)
Residential remoteness		
Major cities	1.70 (0.60, 4.84)	1.41 (0.67, 2.99)
Outer regional	0.44 (0.10, 1.97)	1.09 (0.45, 2.63)
Remote	0.71 (0.18, 2.75)	0.56 (0.18, 1.75)
Very remote	0.43 (0.11, 1.61)	0.90 (0.32, 2.50)
Inner regional	Reference group	Reference group
Maternal mental health contact^b		
Yes	0.75 (0.43, 1.32)	1.29 (0.79, 2.11)
No	Reference group	Reference group
Child has disability		
Yes	2.13 (1.17, 3.88)	1.99 (1.19, 3.32)
No	Reference group	Reference group

Notes: ^a Adjusted for characteristics listed in table.

^b Mother had a mental health diagnosis in HMDC or MHIS records that occurred prior to the child's mental health contact.

^c Bold text denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

APPENDIX D:

Adjusted hazard ratios and 95 per cent confidence intervals for the risk associated with DFV exposure on specific mental health diagnosis groups stratified by Aboriginal and Torres Strait Islander status

The tables below provide the adjusted hazard ratios and 95 per cent confidence intervals (CIs) for the risk associated with DFV exposure on specific mental health diagnosis groups (relating to Figures 8 and 9 in the report) for Aboriginal and Torres Strait Islander children and non-Aboriginal and Torres Strait Islander children. Individual models were run for each group. The first 10 tables provide information on Aboriginal and Torres Strait Islander children and the last 10 tables provide information on non-Aboriginal and Torres Strait Islander children. Adjustments were made for sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness, disability and maternal mental health contact. Bolded text in the tables denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Aboriginal and Torres Strait Islander children

Mental health contact with no diagnosis recorded	
Aboriginal and/or Torres Strait Islander child	Adjusted hazard ratio (95% CI)
DFV exposure	
Yes	1.45 (1.34, 1.57)
No	Reference group

Other mental illness-related contacts	
Aboriginal and/or Torres Strait Islander child	Adjusted hazard ratio (95% CI)
DFV exposure	
Yes	1.07 (0.77, 1.51)
No	Reference group

Intentional self-harm	
Aboriginal and/or Torres Strait Islander child	Adjusted hazard ratio (95% CI)
DFV exposure	
Yes	1.67 (1.31, 2.15)
No	Reference group

Substance use disorder		
Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.85 (1.52, 2.25)
	No	Reference group

Psychological development disorder		
Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.10 (0.95, 1.27)
	No	Reference group

Depressive disorder		
Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.30 (1.00, 1.70)
	No	Reference group

Anxiety disorder		
Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.40 (1.25, 1.58)
	No	Reference group

Schizophrenia and psychoses		
Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.33 (1.09, 1.61)
	No	Reference group

Personality disorder		
Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.71 (0.96, 3.03)
	No	Reference group

Organic disorder		
Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.68 (1.02, 2.76)
	No	Reference group

Non-Aboriginal and Torres Strait Islander children

Mental health contact with no diagnosis recorded		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.56 (1.39, 1.75)
	No	Reference group

Other mental illness-related contacts		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.35 (0.90, 2.03)
	No	Reference group

Intentional self-harm		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.30 (0.90, 1.88)
	No	Reference group

Substance use disorder		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	2.48 (1.52, 4.05)
	No	Reference group

Psychological development disorder		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.22 (1.02, 1.45)
	No	Reference group

Depressive disorder		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.36 (0.99, 1.87)
	No	Reference group

Anxiety disorder		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.51 (1.31, 1.75)
	No	Reference group

Schizophrenia and psychoses		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.42 (1.09, 1.86)
	No	Reference group

Personality disorder		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.66 (0.95, 2.89)
	No	Reference group

Organic disorder		
Non-Aboriginal and/or Torres Strait Islander child		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	0.99 (0.55, 1.77)
	No	Reference group

APPENDIX E:

Adjusted hazard ratios and 95 per cent confidence intervals for the risk associated with DFV exposure on specific mental health diagnosis groups stratified by disability status

The tables below provide the adjusted hazard ratios and 95 per cent confidence intervals for the risk associated with DFV exposure on specific mental health diagnosis groups (relating to Figures 10 and 11 in the report) for children with disability and children with no disability. Individual models were run for each group. The first 10 tables provide information on children with disability and the last 10 tables provide information on children with no disability. Adjustments were made for Aboriginal and Torres Strait Islander status, sex, early gestation (<37 weeks), mother's age at birth, father's age at birth, maternal marital status at birth, SES, residential remoteness and maternal mental health contact. Bolded text in the table denotes statistically significant estimates where the 95 per cent CIs did not include the null value.

Child with disability

Mental health contact with no diagnosis recorded		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.59 (1.44, 1.77)
	No	Reference group

Other mental illness-related contacts		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.72 (1.55, 1.91)
	No	Reference group

Intentional self-harm		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.73 (1.56, 1.92)
	No	Reference group

Substance use disorder		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.72 (1.56, 1.91)
	No	Reference group

Psychological development disorder		
Child with disability		Adjusted hazard ratio (95% CI)
	Yes	1.53 (1.38, 1.71)
	No	Reference group

Depressive disorder		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.72 (1.55, 1.91)
	No	Reference group

Anxiety disorder		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.63 (1.47, 1.81)
	No	Reference group

Schizophrenia and psychoses		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.71 (1.54, 1.89)
	No	Reference group

Personality disorder		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.74 (1.57, 1.93)
	No	Reference group

Organic disorder		
Child with disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.73 (1.57, 1.92)
	No	Reference group

Child with no disability

Mental health contact with no diagnosis recorded		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.88 (1.78, 1.98)
	No	Reference group

Other mental illness-related contacts		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	2.03 (1.93, 2.14)
	No	Reference group

Intentional self-harm		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	2.02 (1.92, 2.13)
	No	Reference group

Substance use disorder		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	2.02 (1.92, 2.13)
	No	Reference group

Psychological development disorder		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.93 (1.83, 2.04)
	No	Reference group

Depressive disorder		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	2.02 (1.91, 2.12)
	No	Reference group

Anxiety disorder		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	1.92 (1.82, 2.03)
	No	Reference group

Schizophrenia and psychoses		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	2.00 (1.90, 2.11)
	No	Reference group

Personality disorder		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	2.05 (1.94, 2.16)
	No	Reference group

Organic disorder		
Child with no disability		Adjusted hazard ratio (95% CI)
DFV exposure		
	Yes	2.05 (1.94, 2.16)
	No	Reference group

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