

The first attachment: *The Prevalence of Acquired Brain Injury Among Victims and Perpetrators of Family Violence* - Brain Injury Australia's report into Australia's first research into Domestic and Family Violence (DFV) and Acquired Brain Injury (ABI) funded by the (then) Department of Health and Human Services, and launched May 1st, 2018 by 2015's Australian of the Year and (then) Chair of the Victorian Government's family violence Victim Survivors' Advisory Council - Rosie Batty AO - in front of 250 people at Melbourne's Town Hall. Among the research's key findings: 2 in every 5 of the 16,000 victims of family violence attending Victorian hospitals over a decade had sustained a brain injury; nearly 1 in every 3 of the victims of family violence were children, and, of those, 1 in every 4 had sustained a brain injury. Furthermore, "of the total number attending hospital for DFV reasons, 60% (9,845) were female. 59% of these females received their injuries from a spouse or domestic partner." And "where the family member alleged to have caused the patient's injuries was a spouse or domestic partner, 84% of patients were female...where the alleged perpetrator of injury was a parent or other family member, 56% of patients were male".

The research was completed by a consortium led by Brain Injury Australia - comprising Monash University, Domestic Violence Victoria, No to Violence and the Centre for Excellence in Child and Family Welfare – implementation of Recommendation 171 of the Royal Commission Into Family Violence; "The Victorian Government fund research into the prevalence of acquired brain injury among family violence victims and perpetrators."

Brain Injury Australia would also like to include the second attachment in its "submission", from 2008's *Medical Journal of Australia* - a forceful reminder of the differential risk exposure of Aboriginal and Torres Strait Islander communities to DFV; - "...Indigenous females experienced 69 times the rate of head injury due to assault experienced by non-Indigenous females."

Founded in 1986, Brain Injury Australia is the national peak advocacy organisation representing the needs of the 700,000 Australians with a brain injury, their families and carers. Alongside providing policy advice to governments, Brain Injury Australia also drives multi-year public awareness campaigns devoted to: the leading cause of death and disability in children who have been abused, inflicted traumatic brain injury - sometimes called "shaken baby syndrome"; concussion in sport; the leading cause of Traumatic Brain Injury (TBI), falls - due to the ageing of populations in developed countries; people with a brain injury in the criminal justice system - as many as 80 per cent of Australia's adult prisoners report brain injury; and women, DFV and ABI.

(By the way, one current focus of Brain Injury Australia's advocacy is seeking to "join the dots" between women and girls' gendered susceptibility and differential risk exposure to Traumatic Brain Injury of all severities and, thus, to neurodegenerative diseases – particularly the dementias. *The Lancet Commission* ["on dementia prevention, intervention, and care"] has recently compiled and confirmed from the research evidence that, alongside "excessive alcohol consumption...and air pollution", TBI "of all severities" almost doubled the risk for "all cause dementia". And the Population Attributable Fraction – the proportional reduction in the dementias that would occur if exposure to TBI as a risk factor were reduced to an ideal exposure scenario – was estimated at 3.4%.

The incidence of the dementias is highly gendered. Worldwide, women with dementia outnumber men 2 to 1 (a recent meta-analysis examining the incidence of Alzheimer's disease in Europe found that approximately 13 women out of 1,000 developed Alzheimer's Disease each year, compared to only seven men). The Australian Institute of Health and Welfare estimates that, in 2021, there were 243,200 women living with dementia compared to 143,000 men. The

primary risk factor for the dementias remains ageing. Australian women outlive men, on average, by four years. Other explanations for the gendered incidence of the dementias include the stronger immune system in women which may result in a greater build-up of amyloid plaques in the brain's fight against infection.

Brain Injury Australia is unaware of any *local* dementia research – including the 429 projects that have received \$466 million in National Health and Medical Research Council - the main statutory authority of the Australian Government responsible for medical research, since 2014, that is directly examining DFV-related ABI (including non-fatal strangulation) as a risk factor.

Regards,

Nick Rushworth

Executive Officer

Brain Injury Australia

[REDACTED]

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THE PREVALENCE OF ACQUIRED BRAIN INJURY AMONG VICTIMS AND PERPETRATORS OF FAMILY VIOLENCE

Informing the Response to Recommendation 171 of the Victorian Royal Commission into Family Violence

Produced by a consortium led by Brain Injury Australia and including Monash University, Domestic Violence Victoria, No to Violence incorporating the Men's Referral Service and the Centre for Excellence in Child and Family Welfare

Commissioned by the Victorian Government Department of Health and Human Services

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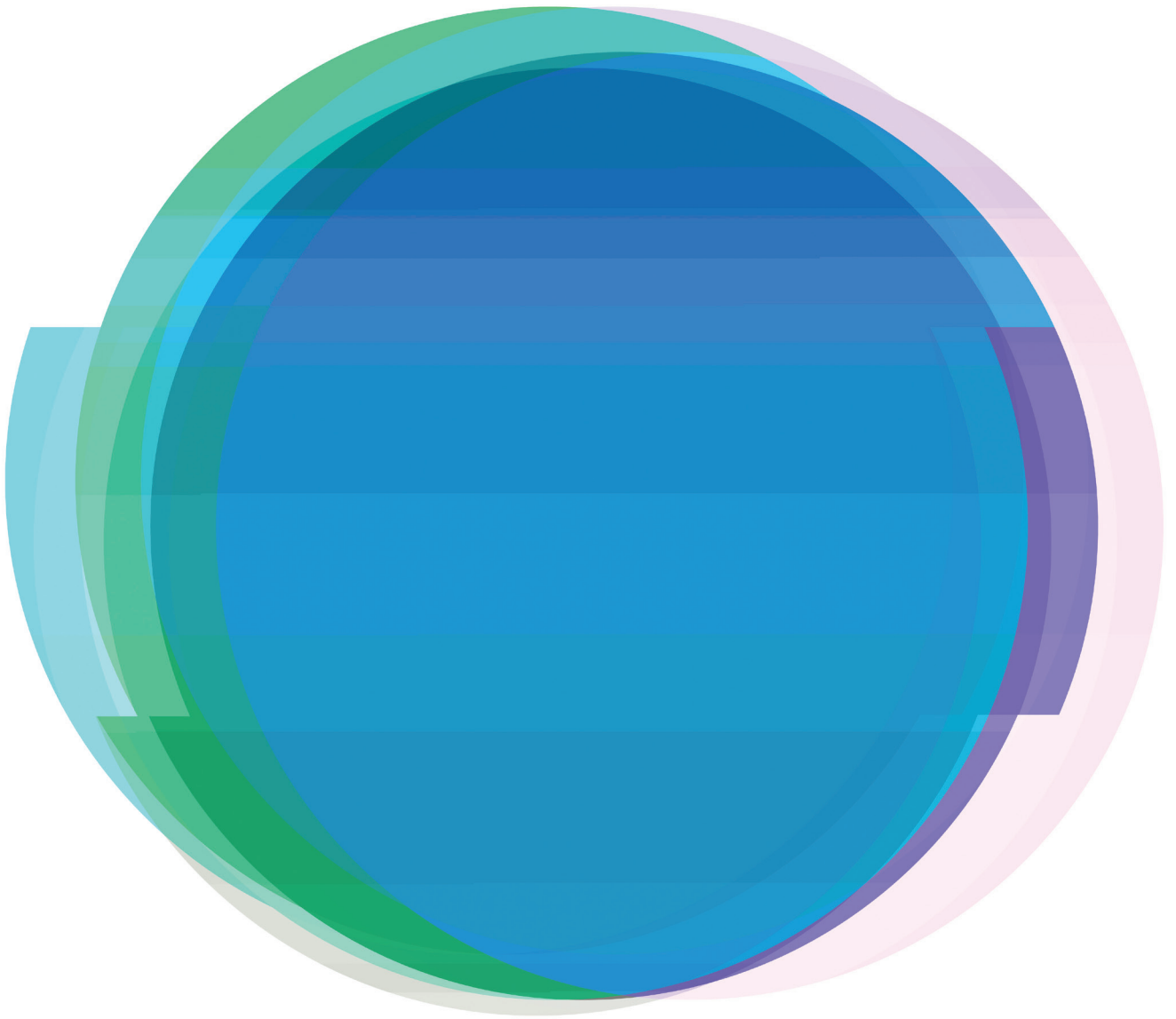
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**THE PREVALENCE
OF ACQUIRED
BRAIN INJURY
AMONG VICTIMS
AND PERPETRATORS
OF FAMILY VIOLENCE**



Foreword

The immediate impetus for Brain Injury Australia's interest in the subject of this research is twofold. Firstly, the national 2015 Brain Injury Awareness Week, which was devoted to women, family violence and traumatic brain injury, garnered significant attention from the media, family violence services and policymakers. Secondly, a 2012 policy paper on sports concussion that Brain Injury Australia prepared for the Australian Government drew attention to the emerging evidence for the disabling consequences of repetitive mild brain injuries¹.

The legacy of Brain Injury Australia's interest in family violence and brain injury goes back to earlier policy papers on victimisation and inflicted traumatic brain injury (including 'shaken baby syndrome')², which is the leading cause of death and disability in children who have been abused, and on perpetration, to people with a brain injury in the criminal justice system (as many as 80 per cent of adult prisoners report brain injury)³.

The lack of Australian research into the prevalence of brain injury among victims and perpetrators of family violence comes as a surprise, given how instinctive it is to 'go for the head' in pursuit of violent advantage.

Brain Injury Australia, with its consortium partners – Monash University, Domestic Violence Victoria, No to Violence incorporating the Men's Referral Service, and the Centre for Excellence in Child and Family Welfare – trusts that this Acquired Brain Injury And Family Violence Project will help raise awareness about brain injury within the family violence service system and lead to further research into hard-to-reach populations. These populations include victims who are unaware of their disability or of the potential cumulative effects of multiple 'mild' brain injuries, and perpetrators who require tailored treatment and interventions to prevent them injuring intimate partners, children and other family members.

Brain Injury Australia would like to thank its consortium partners both for responding so quickly and positively to Brain Injury Australia's invitation, and for their cooperation in completing the research in such a tight timeframe. I would also like to thank all those who volunteered their time and expertise either in attending the August and October workshops or in interview with the researchers. Brain Injury Australia is very grateful for the support and guidance of Department of Health and Human Services staff, in particular from Lisa Thomson and Eleanor Williams.

I would sincerely like to thank the women living with severe brain injury as the result of family violence – Anj Barker, Rebecca Gentz, Toni Wright and Rosanna Robertson – for having the generosity and the courage to share their stories. Without the impact they generated, this research would not have come about.

Nick Rushworth

**Executive Officer
Brain Injury Australia**

1 Nick Rushworth, 'Policy Paper: Concussion In Sport', prepared for the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs, October 2012

2 Nick Rushworth, 'Policy Paper: Inflicted Traumatic Brain Injury in Children', prepared for the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs, October 2012

3 Nick Rushworth, 'Out of Sight, Out of Mind: People with an Acquired Brain Injury and the Criminal Justice System', Prepared for the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs, July 2011

STUDY REPORTS A STRONG ASSOCIATION BETWEEN BRAIN INJURY AND FAMILY VIOLENCE AND SIGNIFICANT GAPS IN SERVICE RESPONSES.



Australia's first evidence-based study of brain injury associated with family violence.

40%

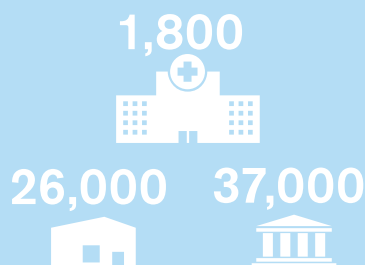
of victims of family violence attending Victorian hospitals over a ten-year period sustained a brain injury.

31%

of victims of family violence attending Victorian hospitals over a ten-year period were children under the age of 15, and 25% of these children sustained a brain injury.



Perpetrators of intimate partner violence are twice as likely to have sustained a brain injury as matched community samples.



1,800 hospital presentations each year are the 'tip of the iceberg', as 26,000 cases are referred to specialist family violence services and 37,000 intervention orders are sought in the Magistrates' and Children's Courts.



Brain injury exacerbates the impacts and avoidable costs of family violence, estimated at \$5.3bn for Victoria in 2015–16.

Executive summary

The Victorian Royal Commission into Family Violence recognised the potential for acquired brain injury to contribute to both perpetration and victimisation in family violence. To inform the Victorian Government's response to Recommendation 171 of the Commission 'that the Victorian Government fund research into the prevalence of acquired brain injuries among both victims and perpetrators of family violence', the Department of Health and Human Services engaged a consortium led by Brain Injury Australia and including Monash University, Domestic Violence Victoria, No to Violence incorporating the Men's Referral Service and the Centre for Excellence in Child and Family Welfare to undertake the Acquired Brain Injury And Family Violence Project.

Brain injury exacerbates the impacts and avoidable costs of family violence for families and for the wider community. Death, permanent disability or temporary disability result in lost opportunities for economic and social participation, independence and quality of life.

For adult and child victims, and perpetrators, brain injury hampers their capacity for change, recovery and future wellbeing. For the community, the costs of policing, hospitalisation and rehabilitation, the increased need for supports, such as income, housing, education and parenting, and lost productivity and increased disability are all higher when brain injury is associated with family violence.

This is the first evidence-based study of acquired brain injury and family violence in Australia. Completed in five months from July to December 2017, this research project identifies a strong association between brain injury and family violence, and significant gaps in service responses, ranging from lack of screening for brain injury through to inadequate opportunities for effective rehabilitation, recovery and support.

Combining available evidence with stakeholder knowledge

The incidence and prevalence of family violence-related brain injury has been estimated from Victorian hospital data and supplemented by international studies reported in the academic literature.

Qualitative evidence of the adequacy of current service responses to brain injury associated with family violence has been derived from interviews with practitioners working in the integrated family violence system. Extensive stakeholder consultation has guided these research components and recommended interventions to address the problem.

Quantitative analysis of Victorian hospital data, including major trauma, hospital admissions and emergency department presentations for the period July 2006 to June 2016, characterised family violence-related injury cases. The researchers examined text narratives, where these were available, to identify as many family violence-related cases as possible. Limitations in the way that attendance at hospital is coded (for example, design, changes over time and undercoding) could result in undercounting of family violence cases and constrain the ability to fully characterise cases.

A longitudinal study of major trauma patients admitted between July 2011 and June 2012 provided a small number of cases for qualitative analysis of patient outcomes in the first five years after injury. These cases included perpetrators (patients who sustained a severe brain injury and became perpetrators of family violence) and victims (patients who sustained a moderate to severe brain injury as a result of family violence).

The systematic review of the international literature on brain injury and family violence found no Australian studies. Of the 65 studies that met the search criteria, most addressed either inflicted traumatic brain injury in children (including 'shaken baby syndrome') or high-risk groups (such as prisoners, domestic violence shelters, military veterans and pregnant women).

The selectivity and design of existing research means that general community estimates of brain injury and family violence are not available, and those results that are available cannot be generalised to the Australian context.

Interviews were conducted with 26 practitioners involved in the integrated family violence system, including specialist family violence services, child and family services, perpetrator intervention services, and related health and justice sectors. Workshops were used to engage with a broader group of stakeholders and consultations were held with service providers to discuss possible interventions.

Incidence of family violence cases recorded by Victorian hospitals

The analysis of 10 years of Victorian hospital data estimates an average annual incidence of family violence-related cases per 100,000 population of:

- 0.37 treated in major trauma
- 9.3 family violence cases admitted to hospital
- 19.6 presenting to emergency departments.

Using 2017 population figures, these rates translate annually to 1,240 emergency department presentations, 588 hospital admissions and 23 major trauma cases in Victoria.

The number of family violence-related cases attending Victorian hospitals is likely to be underestimated. For example, of all hospital admissions for assault in the period from July 2006 to June 2016, 17 per cent were identified as family violence related, whereas 49 per cent recorded the cause of injury as 'unspecified person'.

Over the same 10-year period, there was no evidence of a decline in family violence-related cases, despite a reduction in other interpersonal violence cases over the same timeframe.

Characteristics of family violence-related cases attending Victorian hospitals

Females (of all ages) and children were overrepresented in family violence cases attending Victorian hospitals between July 2006 and June 2016. Of 16,296 family violence cases, 60 per cent (9,845) were female and 31 per cent (5,007) were children under the age of 15.

Of 114,885 hospital attendances for other forms of assault, 24 per cent (27,888) were female and four per cent (4,816) were children under the age of 15.

People identifying as Aboriginal or Torres Strait Islander (0.8 per cent of the Victorian population) were also overrepresented, comprising six per cent or 323 out of 5,165 family violence-related hospital admissions, and three per cent or 343 out of 10,928 family violence-related emergency department presentations.

The hospital datasets from the ten-year period provided information about the family member alleged to have caused the patient's injuries. Of all 16,296 family violence cases attending Victorian hospitals during this time, 43 per cent (7,047) were injured by a spouse or domestic partner, 37 per cent (5,947) were injured by a parent, and 20 per cent (3,304) were injured by another family member (such as a sibling, child, grandfather, uncle, nephew or carer).

In cases where the family member alleged to have caused the patient's injuries was a spouse or domestic partner, 84 per cent of patients were female. In cases where the alleged perpetrator of injury was a parent or other family member, 56 per cent of patients were male.

Brain injury among victims of family violence attending Victorian hospitals

Family violence is a significant cause of brain injury. Around 40 per cent (6,409) of the 16,296 victims of family violence attending Victorian hospitals over the 10 years from July 2006 to June 2016 sustained a brain injury. Of the 31 per cent (5,007) of family violence cases who were children under the age of 15, 25 per cent (1,252) sustained a brain injury.

Fifty-seven percent (116) of the 203 family violence-related major trauma cases, involved brain injury. Brain injury also accounted for 14 of 17 family violence-related deaths over the 10-year period. Brain injury was a factor in 80 per cent or 43 out of 54 cases of children under the age of 15 attending major trauma for reasons of family violence, and 93 per cent or 40 out of 43 of these cases involved a parent perpetrator. Fifty-nine per cent of females (of all ages) attending major trauma for reasons of family violence had a brain injury.

For family violence-related major trauma cases involving brain injury, the outcomes were more severe as:

- 14 per cent died during their hospital stay, compared to 2.9 per cent of cases without a brain injury
- 38 per cent had an Injury Severity Score⁴ greater than 24, compared to only 13 per cent of cases without a brain injury
- 23 per cent were discharged to inpatient rehabilitation, compared to four per cent without a brain injury.

Fifty-four percent (2,774) of the 5,165 family violence-related hospital admissions, involved brain injury. The proportions of patients aged 25 to 64, and of females were slightly higher in these cases.

Thirty-two percent (3,519) of the 10,928 family violence-related emergency department presentations involved brain injury. A higher proportion of these patients were aged 25 to 64, and a slightly higher proportion were from rural and regional areas. Of the family violence-related emergency department presentations where patients identified as Aboriginal or Torres Strait Islander, 42 per cent sustained a brain injury.

The profile of family violence cases with and without brain injury was similar in terms of geographic region of residence and preferred language spoken, and there was only a slightly increased representation from the most socioeconomically disadvantaged groups.

Hospital attendances are the tip of the iceberg

Our analysis of Victorian hospital data establishes that brain injury is a factor in 40 per cent of hospital attendances for family violence, and that the incidence of these cases has remained steady for the past ten years. The literature review provides evidence that, although more than 80 per cent of female victims of intimate partner violence attending hospital have facial injuries, brain injury is seldom diagnosed. Even in hospital, cases of mild traumatic brain injury in adult and child victims of family violence are often missed.

Hospital presentations are likely to be 'the tip of the iceberg', vastly outnumbered by family violence cases seen in other settings. While around 1,800 Victorians go to hospital each year as a result of family violence, around 26,000 cases (involving both victims and perpetrators) are referred to specialist family violence services and 37,000 applications are made for family violence intervention orders in the Magistrates' and Children's Courts of Victoria.

Moreover, the 2016 Australian Bureau of Statistics Personal Safety Survey indicated that more than 220,000 Victorians over the age of 18 reported violence by a partner in the preceding 12 months.

Brain injury among perpetrators of family violence

Although there are few studies of the prevalence of brain injury among perpetrators of family violence, the evidence available indicates that rates of brain injury are disproportionately high in perpetrators of family violence, compared with matched non-violent community samples and the general population.

Studies have found that the rate of brain injury among samples of male perpetrators of intimate partner violence is around 60 per cent, and that this is double the rate found in matched community samples. Similarly, the rate of brain injury among a sample of mothers at risk of child maltreatment is around 36 per cent, which is more than triple the rate found in a community sample of women of the same age.

More generally, studies have shown that acquired brain injury is a risk factor for violent crime due to damage to those parts of the brain that control emotions and regulate behaviour – sometimes referred to as 'challenging behaviours'. The potential for unaddressed brain injury and family violence experiences in childhood to play a role in promoting intergenerational family violence has also been noted in the literature. However, it is not inevitable that a person with a brain injury becomes a perpetrator.

Further research is required to understand the interplay between brain injury and other factors known to influence the perpetration of family violence.

4 The Injury Severity Score (ISS) is an established score to assess the overall severity of a person's injuries. Major trauma is defined if the Injury Severity Score is greater than 12.

New services and referral pathways to reduce the impact of brain injury associated with family violence

Our interviews with practitioners working in the integrated family violence system identified that existing services are inadequate to meet the needs of victims and perpetrators of family violence who have, or are at risk of, brain injury. Practitioners report frustration about their lack of capacity to provide appropriate support to these clients.

Service gaps include:

- screening for potential brain injury
- provision of initial advice and guidance
- making appropriate referral for formal diagnosis
- adapting the services and supports provided to suit the client's brain injury difficulties.

Practitioners provided valuable insights about the barriers to effective intervention on family violence-related brain injury, including:

- limited practitioner awareness and knowledge
- client reluctance to identify brain injury
- difficulty accessing diagnosis
- high costs and low availability of health services.

For the much greater number of adult and child victims of family violence who do not attend hospital or otherwise seek medical attention, the integrated family violence system is a crucial gateway to the detection and diagnosis of brain injury and provision of follow-through services and supports.

For people with a brain injury at increased risk of perpetrating or becoming a victim of family violence due to their disability, early intervention is vital. Tailored services that utilise both positive behaviour support and family violence risk reduction are showing promising results.

It has not been possible to quantify the incidence of brain injury associated with family violence among those Victorians who do not attend hospital. Further research is required to establish the risk of and prevalence of brain injury, and the role of evidence-based interventions for those victims of family violence who are unknown, undetected, undiagnosed or untreated in other settings.

In attempting to scale this larger part of the iceberg 'below the waterline', the consortium's recommendations lay the groundwork for meeting the disability-specific needs of a potentially very large group of Victorian victims.

Recommendations

The consortium recommends that the Victorian Government:

- *develops and distributes information resources on brain injury, aimed at both victims and perpetrators of family violence, as well as the integrated family violence system*
- *adds screening questions for brain injury to family violence risk assessments, including the Multi-Agency Risk Assessment and Management Framework (MARAM)*
- *pilots an integrated brain injury and family violence service to support diagnosis, rehabilitation and harm reduction, in conjunction with complementary government initiatives (for example, the Support and Safety Hubs)*
- *develops (where they do not exist) and maps services and supports for all people with a brain injury at increased risk of perpetrating or becoming a victim of family violence due to their disability, as well as for people with a brain injury resulting from family violence.*

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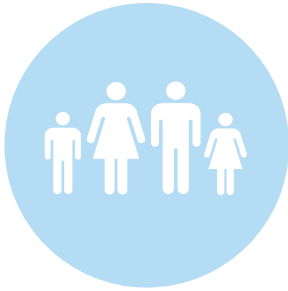
Annex reports available on written request:

Annex A. Incidence, prevalence and factors contributing to brain injury in the family violence context: A literature review

Annex B. Family violence-related traumatic brain injury (TBI): Interrogating Victorian population-based health datasets

Annex C. Incidence, prevalence and factors contributing to brain injury in the family violence context: The practitioner perspective

Definitions



Family violence is defined for the purpose of the Victorian Royal Commission into Family Violence (per Section 5, *Family Violence Protection Act 2008* (Vic)) as:

(a) behaviour by a person towards a family member of that person if that behaviour—

- (i) is physically or sexually abusive; or
- (iii) is emotionally or psychologically abusive; or
- (iv) is economically abusive; or
- (v) is threatening; or
- (vi) is coercive; or

(vii) in any other way controls or dominates the family member and causes that family member to feel fear for the safety or wellbeing of that family member or another person; or

(b) behaviour by a person that causes a child to hear or witness, or otherwise be exposed "to the effects of, behaviour referred to in paragraph (a).

The Family Violence Protection Act defines 'family member' broadly. Family violence can occur in any familial relationship – for example, between current or former intimate partners who are or were married or in de facto relationships, in heterosexual and same-sex relationships, between parents (or step-parents) and children, between siblings, and between grandparents, grandchildren, uncles, aunts, nephews, nieces and cousins. It can also occur in relationships that are considered to be 'family-like' – for example, in certain cultural traditions or between a person with a disability and their unrelated carer (State of Victoria, 2014–2016).

The generally accepted definition of child maltreatment is encompassed by the above definition of family violence (Australian Institute of Family Studies, 2015):

Child maltreatment refers to any non-accidental behaviour by parents, caregivers, other adults or older adolescents, that is outside the norms of conduct and entails a substantial risk of causing physical or emotional harm to a child or young person.



Brain injury is defined as:

Acquired brain injury is used to describe multiple disabilities arising from damage to the brain acquired after birth. It results in deterioration in cognitive, physical, emotional or independent functioning. It can be as a result of accidents, stroke, brain tumours, infection, poisoning, lack of oxygen, degenerative neurological disease, etc. (Australian Institute of Health and Welfare, 2014).

Participants

Organisations represented at workshop 1 (28 participants)

Alfred Health
Brain Injury Australia
Centre for Excellence in Child and Family Welfare
Department of Health and Human Services Victoria
Domestic Violence Victoria
Kildonan Uniting Care
Monash University School of Public Health and Preventive Medicine
Monash University Accident Research Centre
No to Violence incorporating the Men's Referral Service
Victorian Association for the Care and Resettlement of Offenders

Organisations represented at workshop 2 (51 participants)

Alfred Health
Brain Injury Australia
Centre for Excellence in Child and Family Welfare
City of Melbourne
Department of Health and Human Services Victoria
Domestic Violence Victoria
Diverge Consulting
Department of Justice Victoria
Eastern Domestic Violence Service
Epworth Rehabilitation
Kildonan Uniting Care
Magistrates' Court of Victoria
Monash University School of Public Health and Preventive Medicine
Monash University Accident Research Centre
No to Violence incorporating the Men's Referral Service
Quantum Support Services
Royal Children's Hospital
Slater and Gordon
St Vincent's Hospital
Star Health
Swinburne University of Technology
The Australian Childhood Trauma Group
Victoria Police (Family Violence Command)
Women with Disabilities Victoria
Women's Liberation Halfway House

Organisations represented at the Domestic Violence Victoria member session on interventions

Berry Street
Brain Injury Australia
Connections Uniting Care
Domestic Violence Victoria
EACH
Eastern Domestic Violence Service
Centre for Non Violence
Good Samaritan Inn
Good Shepherd Australia New Zealand
In Touch Multicultural Centre against Family Violence
Mallee Domestic Violence Service
No to Violence incorporating the Men's Referral Service
PartnerSpeak
Project Respect
Quantum Support Services
Salvation Army Crossroads Family Violence Service
Star Health
WAYSS Ltd
Women with Disabilities Victoria
WRISC Family Violence Support
Women's Health Goulburn North East
Women's Health West
Women's Liberation Halfway House

Organisations represented at the No to Violence incorporating the Men's Referral Service member session on interventions

Brain Injury Australia
Children's Protection Society
Link Health and Community
No to Violence incorporating the Men's Referral Service
Relationships Australia Victoria
Star Health
Uniting Care
Victorian AIDS Council



Introduction

The Acquired Brain Injury And Family Violence Project (the project) is a consortium led by Brain Injury Australia, which includes Monash University, Domestic Violence Victoria, No to Violence incorporating the Men's Referral Service and the Centre for Excellence in Child and Family Welfare. The project has been funded by the Department of Health and Human Services Victoria in response to Recommendation 171 of the Victorian Royal Commission into Family Violence (State of Victoria, 2014–2016).

The Royal Commission recognised the potential for brain injury to contribute to both perpetration and victimisation in family violence, and highlighted the lack of awareness and screening for brain injury in family violence cases, describing it as 'a sleeper issue'.

Noting the 'limited evidence in Australia on the relationship between family violence and acquired brain injury', the Royal Commission made Recommendation 171 'that the Victorian Government fund research into the prevalence of acquired brain injuries among both victims and perpetrators of family violence'.

Responding to this recommendation, the Department of Health and Human Services developed a brief for the project, requiring research to quantify the:

- extent of acquired brain injury (ABI) among perpetrators, which will potentially inform policies and initiatives to prevent family violence
- prevalence of ABI among victims to potentially inform assistance measures. This recognises that without proper support, the likely trajectory for individuals impacted by both family violence and ABI involves unemployment, homelessness and economic stress, along with continued family violence victimisation and perpetration.

Current and potential interventions covered in the brief included:

- an indication of current referral pathways for victims and perpetrators to receive help and support
- recommendations on ongoing ways to identify referral pathways among ABI perpetrators and victims of family violence, and how services may be best placed to engage and support these individuals and their families.

Project work commenced in late July 2017 and was completed in late December 2017.

The four main activities in the project were:

- a systematic review of literature to examine the prevalence of brain injury among victims and perpetrators of family violence, and also to identify factors driving it
- analysis of hospital admissions, emergency department presentations, trauma registry and existing longitudinal study data, to determine the incidence, case profiles, trends and outcomes of cases involving family violence (including associated brain injury)
- qualitative interviews with practitioners about their perspectives on the prevalence of brain injury among victims and perpetrators of family violence
- exploratory work on interventions aimed at reducing the impact of brain injury and family violence.

These activities are covered in this report and detailed reports of the first three activities are provided as Annexes, authored by Monash University School of Public Health and Preventive Medicine.

Steering committee meetings were held at strategic points throughout the project, and weekly progress meetings were held both within the project team and with the department. Workshops were held to engage with a broader group of stakeholders; in August 2017 to discuss the background and project approach, and in October 2017 to discuss the preliminary project findings.

Working sessions were held with members of Domestic Violence Victoria and No to Violence incorporating the Men's Referral Service to discuss possible interventions.

The project was initiated during a period of major investment and reform to tackle the problem of family violence at both national and state levels. In addition to recommendation 171, the Royal Commission into Family Violence made 43 other recommendations related to brain injury and family violence (see Appendix A). Complementary efforts are also underway within organisations and governments at regional, state and federal levels.

The representative nature of the consortium and the extensive engagement with a broader stakeholder group have kept this project 'live' to the large number of other activities underway, and have strengthened the validity and applicability of the project's findings.

Report structure

The Background chapter outlines the nature of the problem in terms of family violence, acquired brain injury and the intersection between the two. The subsequent chapters describe the research approach, including necessary restrictions on the scope, followed by the main findings of the research. For clarity, the attributes of all family violence cases are discussed separately from those of the subset of family violence cases that are also diagnosed with brain injury.

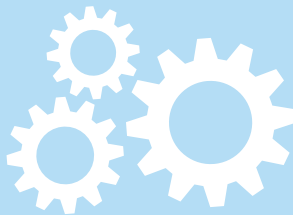
New information on the prevalence of family violence is provided, derived mainly from the quantitative analysis of the hospital population-based datasets. The prevalence of brain injury among perpetrators and victims of family violence is then examined, followed by a focus on interventions and referral pathways, which includes the knowledge and perspectives of service providers, and identifies key gaps in systems and services. The conclusion includes the consortium's recommendations.

References and a glossary are provided at the end of the report. Appendix A lists the recommendations of the Royal Commission into Family Violence that are related to the issue of brain injury associated with family violence. Appendix B provides detail on the rationale for the needs analysis and resulting recommendations.

FAMILY VIOLENCE IS THE MOST PERVASIVE FORM OF VIOLENCE PERPETRATED AGAINST WOMEN IN VICTORIA. WHILE BOTH MEN AND WOMEN CAN BE PERPETRATORS OR VICTIMS OF FAMILY VIOLENCE, OVERWHELMINGLY THE MAJORITY OF PERPETRATORS ARE MEN, AND VICTIMS ARE WOMEN AND CHILDREN.



Family violence is the largest avoidable risk factor for preventable illness, disability and death for women aged 15 to 44. It is also a key driver for homelessness and child protection notifications.



In Victoria, the response to family violence draws on an integrated system of government, statutory and community-based organisations.



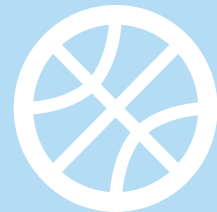
Acquired brain injury includes traumatic brain injury (TBI) due to an external force applied to the head, and non-TBI, including from stroke, lack of oxygen or strangulation, or poisoning.



TBI has been linked to increased risk of perpetration of crime and multiple or more severe TBIs have been associated with more violent offending. There is a pressing need for more research to characterise the association between TBI and criminal behaviour in offender populations.



Rehabilitation for moderate and severe TBI is usually provided by a combination of inpatient and community services, with an interdisciplinary team. Rehabilitation services for mild TBI are not universally available or accessible in Victoria, especially in rural and regional areas.



Recent media interest in sports concussion has led to a significant international investment in researching the potential long-term effects of multiple mild TBIs, including early onset dementia.

Background

Family violence

The Royal Commission into Family Violence adopted the definition for family violence that is provided in the Family Violence Protection Act (see Definitions). Recognising the diversity of needs and experiences related to family violence, the Royal Commission paid specific attention to:

- children
- seniors
- Aboriginal and Torres Strait Islander peoples
- people within culturally and linguistically diverse communities
- lesbian, gay, bisexual, transgender and intersex people
- people living in rural, regional and remote communities
- people with a disability.

These groups have been identified as bearing a disproportionate risk of family violence and its effects.

Nature of family violence

The Terms of Reference for the Royal Commission state that:

Family violence is the most pervasive form of violence perpetrated against women in Victoria. While both men and women can be perpetrators or victims of family violence, overwhelmingly the majority of perpetrators are men, and victims are women and children.

The causes of family violence are complex, and include gender inequality and community attitudes towards women. Contributing factors may include financial pressures, alcohol and drug abuse, mental illness, and social and economic exclusion. In Victoria, three-quarters of victims in family violence incidents attended by police are female and 77 per cent of perpetrators recorded by police are male.

A major driver of family violence is understood to be the exertion of power and control, typically by a man, over his partner and children (Our Watch, 2018). Family violence may present as single isolated instances, or be a pattern of abuse experienced over time (Department of Human Services, 2012).

The impacts of family violence are substantial and wide reaching. A recent estimate places the total cost of family violence in Victoria at \$5.3bn in 2015–16, of which \$1.8bn was borne by government, \$2.6bn by individuals and their families, and \$918m by the Victorian community and broader economy (KPMG, 2017).

For victims of family violence, including children, its effects can be profound and lifelong. Family violence is the largest avoidable risk factor for preventable illness, disability and death for women aged 15 to 44. It is also a key driver for homelessness and child protection notifications (Our Watch, 2018).

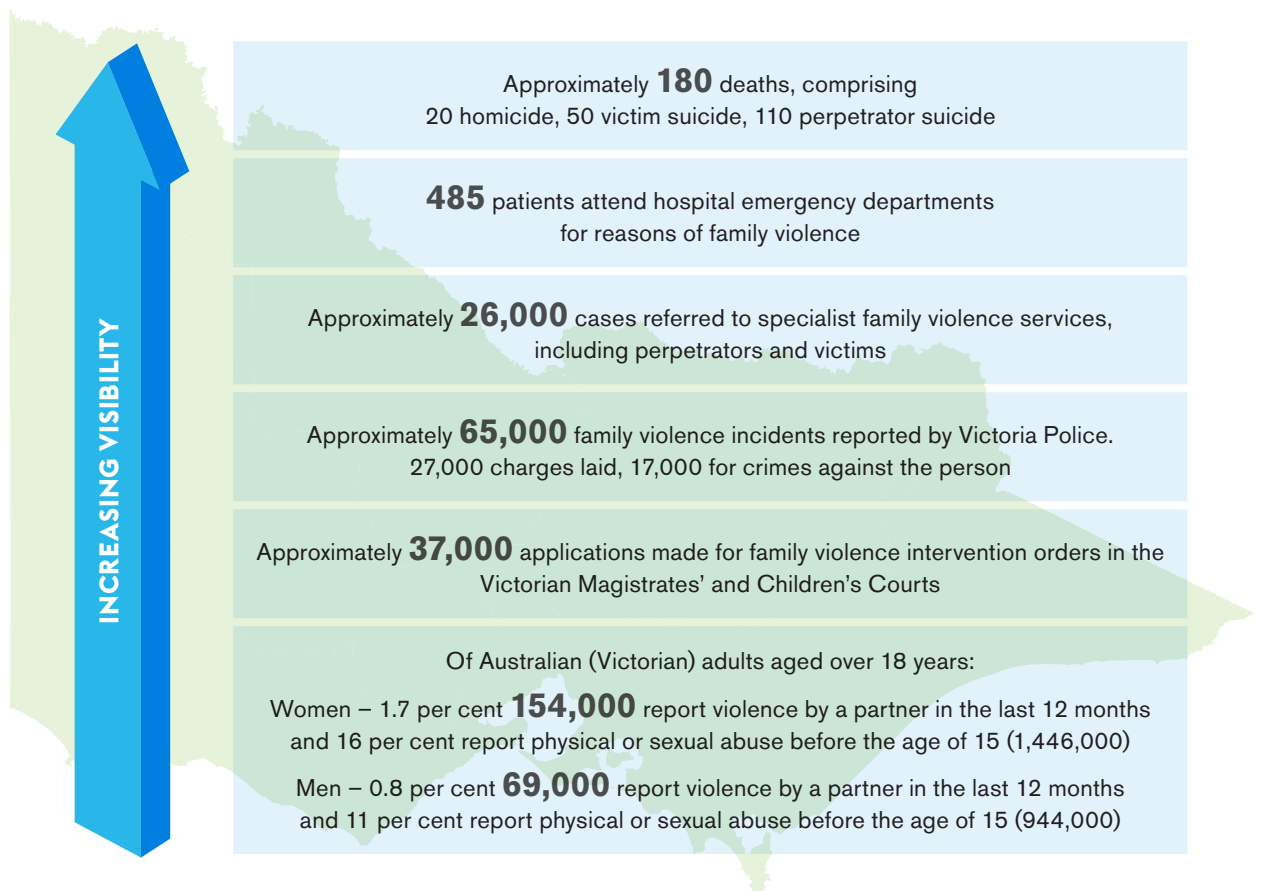
Other difficulties that arise for victims of family violence, such as anxiety and insecurity, severely reduce their wellbeing and opportunity for employment and social connection (Domestic Violence Victoria, 2018a).

Extent of family violence

The report for the Royal Commission brought together the data available on family violence in Victoria (State of Victoria, 2014–2016). Since that report's publication, the Australian Bureau of Statistics has released the findings of its latest Personal Safety Survey (Australian Bureau of Statistics, 2017).

Figure 1 provides an indicative sample of data, which demonstrates that available data only illustrates a small part of the family violence problem, and data from different sources may lead to underreporting and double counting. The iceberg-like nature of family violence makes it difficult to estimate incidence or prevalence because of the amount of abuse that remains unseen, unreported or unknown.

Figure 1. Indicative data on family violence (annual estimates for Victoria)



These figures provide a broad context for the work undertaken by this project, which explores brain injury associated with family violence.

Responses to family violence

In Victoria, the response to family violence draws on an integrated system of government, statutory and community-based organisations, including:

- specialist family violence services, including refuges
- housing services
- community legal services
- police
- Magistrates' Courts and Family Courts
- child and family services
- child protection
- men's referral services and men's behaviour change programs
- corrections services.

(Domestic Violence Victoria, 2018b, Department of Human Services, 2012)

The Royal Commission provides an overview of the family violence system and a history of major developments that have taken place to 2015. Their report goes on to make 227 recommendations, which signify further reform of the family violence system.

The Victorian Government has committed to implementing all of the Royal Commission's recommendations, including the establishment of Support and Safety Hubs, which will provide a focal point for referral in each of the 17 Department of Health and Human Services local areas.

Acquired brain injury

Acquired brain injury (see Definitions) includes traumatic brain injury (TBI) due to an external force applied to the head, and non-TBI, including from stroke, lack of oxygen or poisoning. The severity of TBI may be categorised as 'mild', 'moderate' or 'severe', according to the Glasgow Coma Scale (GCS), which assesses the injured person's response to stimuli, and the duration of post-traumatic amnesia (PTA), which is the period during which the injured person is unable to lay down new memories.

Nature of acquired brain injury

Brain injury can result in physical, cognitive and behavioural disability.

The physical disabilities include:

- paralysis
- poor balance or coordination
- chronic pain
- seizures
- loss of the sense of taste or smell
- vision and hearing disturbance
- speech impairment.

Cognitive disabilities include:

- fatigue
- problems with memory and concentration
- difficulties with goal-setting, formulating and operationalising plans, making decisions and reacting to environmental changes
- learning new information and learning from mistakes
- thinking through consequences.

Behavioural disability can result from damage to those parts of the brain responsible for its higher, so-called 'executive' functions.

A recent Australian study assessed 659 clients of New South Wales' 14-centre Brain Injury Rehabilitation Program for 'challenging behaviours' (sometimes referred to as 'behaviours of concern').

More than half (53 per cent) of the study participants 'met criteria for challenging behaviour', including: 'inappropriate social behaviour; verbal aggression; adynamia/lack of initiation; perseveration/repetitive behaviour; physical aggression against others; physical aggression against objects; physical acts against self; inappropriate sexual behaviour and absconding/wandering behaviour' (Brain Injury Rehabilitation Directorate, 2010).

Significantly, 'unlike most neurobehavioural consequences of TBI that improve over time, irritability, aggression and other behaviour problems may worsen, both in children and adults' (Ylvisaker et al., 2007).

Longer-term consequences of acquired brain injury

Recent media interest in sports concussion has led to a significant international investment in researching the potential long-term effects of multiple mild TBIs (Finnoff et al., 2011), including:

- chronic traumatic encephalopathy – a degenerative condition linked to repeated concussions
- cognitive impairment
- early onset dementia
- movement disorders
- psychiatric disorders
- potentially, motor neuron disease.

A study of all Swedes aged 50 years and over (Nordstrom and Nordstrom, 2018), found that a documented TBI increased the risk of a diagnosis of dementia by 80 per cent, and also identified a 'dose-response relationship' in that:

- a single mild TBI increased the risk by 60 per cent
- a single severe TBI doubled the risk
- multiple TBIs almost tripled the risk, regardless of sex.

A case-control study of 40 Canadian women diagnosed with Alzheimer's disease and reporting 'spousal abuse with head trauma'⁵, found the 'odds of [Alzheimer's disease] for victims of spousal abuse could possibly be as high as four times greater than those not abused, and clearly indicates the need for a larger study to evaluate spousal abuse as a potential risk factor' for dementia⁶ (Leung et al., 2006).

Acquired brain injury has also been linked to increased risk of perpetration of crime. The New South Wales' Brain Injury Rehabilitation Directorate's research into 'challenging behaviours' referred to above, found 'increased contact...with police and the criminal justice system' was one of the 'notable consequences of challenging behaviour' (Brain Injury Rehabilitation Directorate, 2010).

A range of studies have examined TBI as a risk factor for violent crime. A recent meta-analysis of twenty TBI prevalence studies involved 4,865 adults imprisoned for violent crime in the United States, the United Kingdom, New Zealand and Australia. The study reported an average TBI prevalence of 60 per cent (ranging from 10 per cent to 100 per cent) (Shiroma et al., 2010).

TBI has also been identified as a risk factor among young offenders, and multiple or more severe TBIs have been associated with more violent offending (Williams et al., 2010, Kenny and Lennings, 2007). A prospective study of 1,265 children born in New Zealand in 1977 found those who sustained a mild TBI prior to age five were at between 35 per cent and 129 per cent increased risk of contact with the criminal justice system than a control group with no history of TBI (McKinlay et al., 2010).

While an association between TBI and criminal behaviour has been observed, the causal relationship has not been clearly established.

There is a pressing need for more research to characterise the association between TBI and criminal behaviour in offender populations. In particular, longitudinal studies are needed to understand the increased risks of crime in those with TBI, the causal relations between TBI and criminal behaviour, and the factors that contribute to these risks. Furthermore, studies are needed to characterise imaging abnormalities and neuropsychological impairments associated with TBI in offender populations to understand how brain injury affects behaviour, including risk of reoffending (Maas et al., 2017).

5 'having been struck on the head on five or more occasions with loss of consciousness (of any time duration) on two or more of these occasions, the details of which are provided by the patient and substantiated by one or more of her children'

6 'Two control groups of 40 women were established. Control group 1 consisted of women who presented with ischaemic neurological disease such as stroke or transient ischaemic attack. Control group 2 consisted of women over age 45 years presenting with a diagnosis of epilepsy.'

Extent of acquired brain injury

There is limited information available on the incidence and prevalence of acquired brain injury in Australia.

The Australian Institute of Health and Welfare reported 22,710 hospitalisations for TBI during 2004–2005, of which 165 were sustained by women due to an assault by a spouse or domestic partner, acquaintance or friend, or other family member (Helps et al., 2008). The report did not disaggregate the hospitalisations by injury severity.

Access Economics (2009) estimated there were 1,493 new cases of moderate TBI and 1,000 new cases of severe TBI in Australia during 2008.

In an analysis for Brain Injury Australia, the Australian Bureau of Statistics (2012), when interpreting data from its *Survey of Disability, Ageing and Carers 2012*, estimated that 727,000 Australians were living with an acquired brain injury in 2012, with daily activity limitations and participation restrictions.

Responses to acquired brain injury

Rehabilitation for moderate and severe TBI is usually provided by a combination of inpatient and community services, with an interdisciplinary team including rehabilitation physicians and nurses, neuropsychologists, clinical psychologists, physiotherapists, speech pathologists, occupational therapists and others.

'Although such specialised teams are available in all regions of Australia, some states have more comprehensive services than others' (Khan et al., 2003). Recovery 'is most rapid in the first three to six months' (Jagnoor and Cameron, 2014), but 'long-term studies...show ongoing improvements for at least two to five years after injury' (Khan et al., 2003).

It is estimated that between 70 per cent and 85 per cent of all TBIs are mild (Khan et al., 2003). While most people sustaining a mild TBI make a complete recovery within three to six months, a recent World Health Organization review that summarised more than 100 studies of outcomes following mild TBI, concluded that '22% to 36% of patients continue to report three or more post-traumatic symptoms six months after injury' (Carroll et al., 2014). 'This large group of people with TBI can face many years of impairment, possibly affecting health, education, occupation, and social and emotional functioning' (Donovan et al., 2014).

Rehabilitation services for mild TBI are not universally available or accessible in Victoria, especially in rural and regional areas (Knox et al., 2017).

Brain injury associated with family violence

A simplified view of the association between family violence and brain injury for both perpetrators and victims is provided in Table 1 (see Appendix B for a more detailed description). A pre-existing brain injury can result in 'challenging behaviours', such as aggression, which, if unaddressed, may contribute to that person's propensity to perpetrate family violence.

A person with a brain injury may be more vulnerable to becoming a victim of family violence due to their loss of agency and care arrangements.

People who are already victims of family violence are at risk of sustaining a brain injury. In this group, women and children have greater vulnerability to brain injury, including the cumulative effects of mild injuries, especially when the brain isn't allowed sufficient time to repair and recover.

For all groups, the risk of brain injury may be compounded by drug and alcohol abuse. In turn, a person's risk of drug and alcohol abuse may be increased by both brain injury and family violence.

The strong and multiple drivers and feedbacks implied in Table 1 may help to explain the apparent intractability of some aspects of family violence, and suggest points for intervention. For example, people with pre-existing brain injury could be more comprehensively followed up to identify and address challenging behaviours if they emerge, and taking account of the potential for family violence.

Similarly, victims of family violence with a brain injury could be supported to reduce their exposure to harm, and to maximise their recovery and life prospects.

Table 1. Groups experiencing brain injury and family violence

Predisposing factor	Factor influencing personal outcome	Personal outcome	Impact
Pre-existing brain injury	Inadequately addressed 'challenging behaviours'	Perpetrator of family violence	Increased avoidable costs due to family violence Increased vulnerability to and/or propensity to commit future family violence events
Pre-existing brain injury	Loss of agency and inadequate oversight of care arrangements	Victim of family violence	
Victim of family violence	Violence leads to a brain injury (women and children are more vulnerable)	Victim of family violence with a brain injury	

Note: Alcohol and drug use may result in or exacerbate the impacts of brain injury, and may be more likely in the context of family violence and brain injury.

Approach

The incidence and prevalence of family violence-related brain injury has been estimated from Victorian hospital data supplemented by international studies reported in the academic literature. Qualitative evidence of the adequacy of current service responses to brain injury associated with family violence has been derived from interviews with practitioners working in the integrated family violence system. Extensive stakeholder consultation has guided these research components and has recommended interventions to address the problem.

Literature review

A rapid systematic review was conducted to investigate the current literature regarding prevalence, incidence and contributing factors of brain injury within a family violence context (see Annex A for details). The search strategy was designed to provide, within the project timeframe, a reasonable indication of the literature and data available on the topic of brain injury and family violence, nationally and internationally.

The search strategy yielded 65 studies that met the inclusion criteria. Forty-two of these studies were conducted in the United States, five in New Zealand and 12 were from the United Kingdom, Taiwan, Nigeria, Canada, Wales, Estonia, France, Japan, China, Brazil and Spain. The remaining six studies reflected the global context of brain injury and family violence. There were no Australian studies.

The study designs comprised:

- 22 retrospective record audits or retrospective cohort studies
- 11 cross-sectional studies
- 16 primary studies (qualitative research, case control, case series, prospective cohort and court reviews)
- 16 literature reviews.

The majority of studies examined the prevalence and/or incidence of inflicted TBI in children, including 'shaken baby syndrome'. Other studies focused on high-risk groups within the population, such as groups recruited via hospitals, prisons, domestic violence shelters and domestic violence support groups. Other groups studied included military veterans and pregnant women.

The selectivity and design of existing research means that general community estimates of brain injury and family violence are not available, and available results cannot be generalised to the Australian context.

What does emerge from the literature is a consistent association between brain injury and family violence.

For the purposes of this project, findings reported in the literature have been grouped according to whether the assessment was based on:

- pre-screening (questions asking about loss of consciousness, being hit in the head)
- screening (validated tools such as the HELPS screening tool developed by the International Center for the Disabled in 1992 (National Association of State Head Injury Administrators, 2018))
- diagnosis (brain imaging, neuropsychological assessment).

Pre-screening and screening methods help to assess a person's risk of having sustained a brain injury, but do not constitute a diagnosis. This is an important distinction and carries through to the proposed interventions and recommendations of this project.

Hospital population-based datasets

An analysis was conducted of data from three population-based datasets and one population-based longitudinal study of injury outcomes for the period July 2006 to June 2016 (see Annex B for details).

The datasets were:

- the Victorian State Trauma Registry (VSTR), which collects and analyses patient information from 138 health services managing trauma patients across Victoria
- the Victorian Admitted Episode Dataset (VAED), which details each admitted patient episode for all Victorian public and private hospitals, including rehabilitation centres, extended care facilities and day procedure centres
- the Victorian Emergency Minimum Dataset (VEMD), which details presentations at 40 Victorian public hospitals with designated emergency departments
- REcovery after Serious Trauma – Outcomes, Resource use and patient Experiences (RESTORE), which is a longitudinal study of major trauma patients with a date of injury from July 2011 to June 2012, exploring patient outcomes in the first five years after injury.

Rigorous methods were used to capture as many cases of family violence-related TBI from the datasets as possible. These methods are detailed in Annex B and have enabled improved estimates and a uniquely authoritative account of hospitalisations for family violence-related injury and associated brain injury.

The six aims addressed in the analysis of population-based datasets were to:

- describe the incidence of hospitalised family violence-related TBI in Victoria
- describe the profile of patients sustaining family violence-related TBI in Victoria
- report the proportion of family violence-related TBI emergency department presentations, hospital admissions and major trauma cases in Victorian over the past decade
- describe the longer-term outcomes of family violence-related TBI
- explore the lived experience of major trauma patients who have sustained a TBI through violence
- provide estimates of the number of new cases each year of family violence-related TBI in Victoria who will experience life-long impacts.

Practitioner perspectives

A qualitative study (see Annex C for details) was conducted with practitioners to gain their perspective on the extent and indicators of brain injury associated with family violence and the potential contributing factors. The study included 22 practitioner interviews and one focus group with four practitioners.

Brain Injury Australia also held consultations with stakeholders to generate ideas on interventions to reduce the impact of brain injury and family violence.

Quality of evidence

This section describes the limitations of the quantitative and qualitative analyses conducted by Monash University School of Public Health and Preventive Medicine for this project (see Annexes A, B and C).

Coverage

The systematic review of the international literature identified few prior research studies that directly addressed the topic of brain injury and family violence, and found no Australian studies. This limited coverage of the topic in the academic literature restricts the strength and generalisability of the project's conclusions.

Quantitative analysis of administrative health data (hospital datasets) provided new information on family violence-related injury cases attending hospital, including major trauma, hospital admissions and emergency department presentations. The short timeframe for the study precluded applying for, obtaining and analysing linked datasets. Therefore, it was not possible to assess recidivism in this report, or to assess patterns of presentation in people known to be victims of family violence.

Future analysis should focus on establishing linked datasets to better understand patterns of presentation, recidivism and long-term healthcare utilisation in this patient population.

It has not been possible to quantify the incidence of brain injury associated with family violence among those Victorians who do not attend hospital. A carefully designed program of screening, complemented by follow-up diagnosis and support services, is needed to confirm the presence of brain injury, and to help clients deal with the implications of their suspected injury. This finding forms part of the report's recommendations.

Practitioner interviews have provided useful insights about knowledge and service gaps. However, it has not been feasible to gather information from clients (victims and perpetrators of family violence) about their experiences.

Data quality

The data provided in this report has largely been obtained from existing administrative health datasets and the statewide population-based trauma registry. Changes in coding over time, and limitations in the codes used in these datasets, limits the capacity to characterise family violence cases.

The diagnosis codes (ICD-10-AM⁷) used provide limited information about the alleged perpetrator of the injury and the details of the event (for example, an inability to separate strangulation from hanging and suffocation). The nature of family violence may also result in undercoding or incomplete coding of family violence cases, as the details may not be fully disclosed at the point of healthcare or during hospitalisation.

Text narratives of the injury event were included in the VSTR for major trauma, and the VEMD for emergency department presentations. This additional information was not available in the VAED for hospital admissions.

Where they were available, the quality of the text narratives varied substantially, limiting the ability to establish the sex of the alleged perpetrator of the injury (for example, whether a parent who injured their child was male or female) and to gather further information about the event leading to hospitalisation.

Review of administrative health dataset coding should be undertaken to maximise the capacity to obtain data that is useful for prevention and management purposes, and to enable more detailed monitoring of trends in family violence over time, as implemented prevention programs and policy changes take effect.

The identification of TBI cases is specific to each dataset as different coding systems are employed.

The approach the Monash University researchers employed included:

- The VSTR (major trauma cases) uses the Abbreviated Injury Scale that allows coding of injuries to the head and has an inbuilt severity scoring system ranging from 1 (mild) to 6 (maximum). For the purpose of analysis, a TBI was defined if the person had sustained any injury to the head region (concussion, brain injury or skull fracture) of any severity. A 'serious' TBI was defined as an injury to the head with a severity score of 3 (serious) or higher.
- The VAED (hospital admissions) uses ICD-10-AM coding to record injury diagnoses. For the purposes of analysis, a TBI was defined if a code in the range S00 to S09 was recorded, including all concussion, intracranial injuries and skull fractures.
- The VEMD (emergency department presentations) records a limited number of diagnoses, coded using ICD-10-AM. These diagnosis codes were used to identify TBI cases in the same way as for the hospital admissions data.

A number of demographic indicators, such as age at the time of injury, sex, preferred language, socioeconomic status and geographic remoteness, were able to be obtained from the health datasets, while others were not consistently available.

The VSTR does not collect information about whether the person identifies as Aboriginal or Torres Strait Islander. However, an indicator for Aboriginal or Torres Strait Islander status is available for the hospital admissions and emergency department presentations.

7 ICD-10-AM is the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification. It consists of a tabular list of diseases and accompanying index (see <https://www.accd.net.au/lcd10.aspx>).

THE ANALYSIS OF VICTORIAN HOSPITAL DATA BETWEEN JULY 2006 AND JUNE 2016 YIELDS NEW INFORMATION THAT CONTRIBUTES TO THE CURRENT STATE OF KNOWLEDGE ON FAMILY VIOLENCE.



Ten years' hospital data on family violence cases

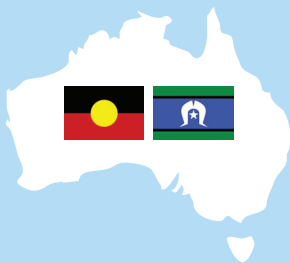
- 203 major trauma cases, of which 17 died
- 5,165 hospital admissions
- 10,928 presentations to emergency departments.



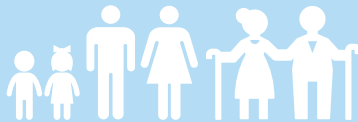
Irrespective of the source of data, there was no evidence of a decline in family violence-related cases over the 10-year period. By contrast, evidence supports a reduction in the incidence of other interpersonal violence cases over the same timeframe.



The number of people attending hospital for reasons of family violence is likely to be underestimated. Of 29,945 hospital admissions for assault, 17% were identified as family violence-related whereas a further 49% recorded the perpetrator as 'unspecified person'.



People identifying as Aboriginal or Torres Strait Islander were overrepresented in hospital admissions (6%) and emergency department presentations (3%) compared with the Victorian population (0.8%).



Of all 16,296 family violence cases attending Victorian hospitals:

- 43 per cent were injured by a spouse or domestic partner
- 37 per cent were injured by a parent
- 20 per cent were injured by another family member.



Of all victims of family violence presenting to hospital:

- 84% victims of a spouse or domestic partner were women
- 54% victims of a parent were male
- 59% victims of another family member were male.

Prevalence of family violence

The aims of the analysis of Victorian hospital data (see Annex B) were focused specifically on brain injury associated with family violence. However, the analysis also yielded broader prevalence data on family violence that contributes to the current state of knowledge on family violence. That data is presented in this section, followed by data that is specific to brain injury among perpetrators and victims of family violence.

Understanding family violence cases

The identity of the person alleged to have caused injury to the hospital patient has been derived from hospital records and has been allocated the term 'perpetrator' for the purposes of the analysis in this chapter and Annex B. It is important to note that hospital data provides limited and unverified information about the circumstances leading to a patient's attendance at hospital.

The alleged perpetrator of the injury may not be the same person as the perpetrator of family violence. Similarly, the patient cannot be assumed to be the victim of family violence. For example, the person causing the injury might have acted in self-defence (Domestic Violence Death Review Team, 2017). For this reason, the term 'cases' of hospital attendance is used throughout this report to ensure attribution of 'victim' and 'perpetrator' of family violence is not oversimplified (see Glossary).

Number of cases

Analysis of Victorian hospital data over the 10-year period from 2006 to 2016 identified:

- 203 family violence-related major trauma cases (average annual incidence 0.37 per 100,000 population) of which 17 died
- 5,165 family violence cases admitted to hospital⁸ (average annual incidence 9.3 per 100,000 population)
- 10,928 family violence cases presenting to emergency departments (average annual incidence 19.6 per 100,000 population).

These figures improve on the annual estimate provided in the report of the Royal Commission into Family Violence (485 emergency department presentations for reasons of family violence, see Figure 1). The improved annual estimate (average annual incidence applied to Victoria's 2017 population) is 1,240 emergency department presentations, 588 hospital admissions and 23 major trauma cases.

Irrespective of the source of data, there was no evidence of a decline in family violence-related cases over the 10-year period. By contrast, evidence supports a reduction in the incidence of other interpersonal violence cases over the same timeframe. This observation is consistent with the findings of the recent *ABS Personal Safety Survey* (2016).

The proportion of Australians experiencing violence in the previous 12 months has declined over the last decade, driven by a drop in experiences of physical violence, from 7.5 per cent in 2005 to 4.5 per cent in 2016. By contrast, the prevalence of partner violence (including physical and sexual violence) has remained relatively stable over the last decade (Australian Bureau of Statistics, 2017).

Major trauma cases

Family violence major trauma cases differed from other major trauma with an overrepresentation of children and women, and a higher proportion of cases residing in the most socioeconomically disadvantaged areas.

Compared to other interpersonal violence cases, the key differences for the family violence group were:

- the much higher representation of females
- the lower representation of adolescents
- a higher representation of children and older adults
- a lower prevalence of pre-existing mental health, drug and alcohol conditions.

8 In addition, 49 per cent of hospital admissions for assault with an external cause code recorded the perpetrator as 'unspecified person'. This could result in undercounting of family violence cases in this category.

While the Injury Severity Score⁹ of family violence cases was similar to unintentional (accidental) injury cases, the median length of hospital stay was almost two days shorter for family violence cases. Of 203 family violence cases, only 13 per cent were discharged to inpatient rehabilitation, compared with 43 per cent of unintentional injury. The proportion of cases that died during their hospital stay was higher for family violence cases, compared to other violence groups (8.4 per cent versus 5.8 per cent).

Most (82 per cent) family violence cases were injured in their own home. The most common type of injury was penetrating trauma (36 per cent), followed by blunt trauma involving hitting, punching and kicking (34 per cent) and assault with a blunt object (nine per cent). Consistent with the high proportion of penetrating trauma, the most common cause of family violence-related major trauma in people over the age of 14 years was a cutting or piercing object, typically a kitchen knife.

Assault with an object was confined to major trauma cases aged 15 to 64 years only. The exact mechanism of injury was unknown in almost 13 per cent of cases classified as family violence, and this was most common in the case of injured children.

Hospital admissions

In cases where the perpetrator was a spouse or domestic partner, 84 per cent of family violence-related admissions were female, compared with 16 per cent male. Compared with other assault admissions, family violence assault admissions (5,165) involved a higher percentage of women (66 per cent compared with 21 per cent), children (7.1 per cent compared with 2.9 per cent) and older adults (6.5 per cent compared with 3.2 per cent).

There was also a slightly higher representation of socioeconomic disadvantage and languages other than English. Six per cent (323) of family violence-related hospital admissions identified as Aboriginal or Torres Strait Islander, which shows this group is overrepresented, as the proportion of Aboriginal and Torres Strait Islander people living in Victoria in 2016 was 0.8 per cent (Australian Bureau of Statistics, 2016).

Among family violence-related assault admissions, the most common causes were bodily force (61 per cent), assault by sharp object (12 per cent), assault by blunt object (8.7 per cent) and other maltreatment (6.5 per cent). Together, these causes accounted for 89 per cent of family violence-related admissions. Assault by suffocation, strangulation or hanging accounted for one per cent of family violence-related hospital admissions.

Head injuries (not necessarily the main injury) were more common among family violence-related (54 per cent) and assault-related (69 per cent) admissions compared with all external cause admissions (21 per cent). Of the family violence-related admissions who identified as Aboriginal or Torres Strait Islander, 54 per cent had sustained a head injury.

Although all assault admissions (family violence and other assault) were more likely to have sustained a serious injury than other external cause admissions, they were also more likely to have a shorter stay in hospital.

Emergency department presentations

Compared with other assaults presenting at emergency departments, assaults related to family violence (10,928) involved a higher proportion of females (58 per cent compared with 26 per cent)¹⁰ and children (42 per cent compared with 4.7 per cent).

There was also a slightly higher representation from the Melbourne metropolitan area and areas of socioeconomic disadvantage, and a higher proportion reported a preferred language other than English. Three per cent (343) of family violence-related emergency department presentations identified as Aboriginal or Torres Strait Islander.

Among family violence-related emergency department presentations, the most common causes were being struck by or colliding with a person (38 per cent), and being struck by or colliding with an object (9.1 per cent). The cause was unspecified in 26 per cent of cases.

9 The Injury Severity Score (ISS) is an established score to assess the overall severity of a person's injuries. Major trauma is defined if the Injury Severity Score is greater than 12.

10 The proportion of females is given as an aggregate figure across all age groups.

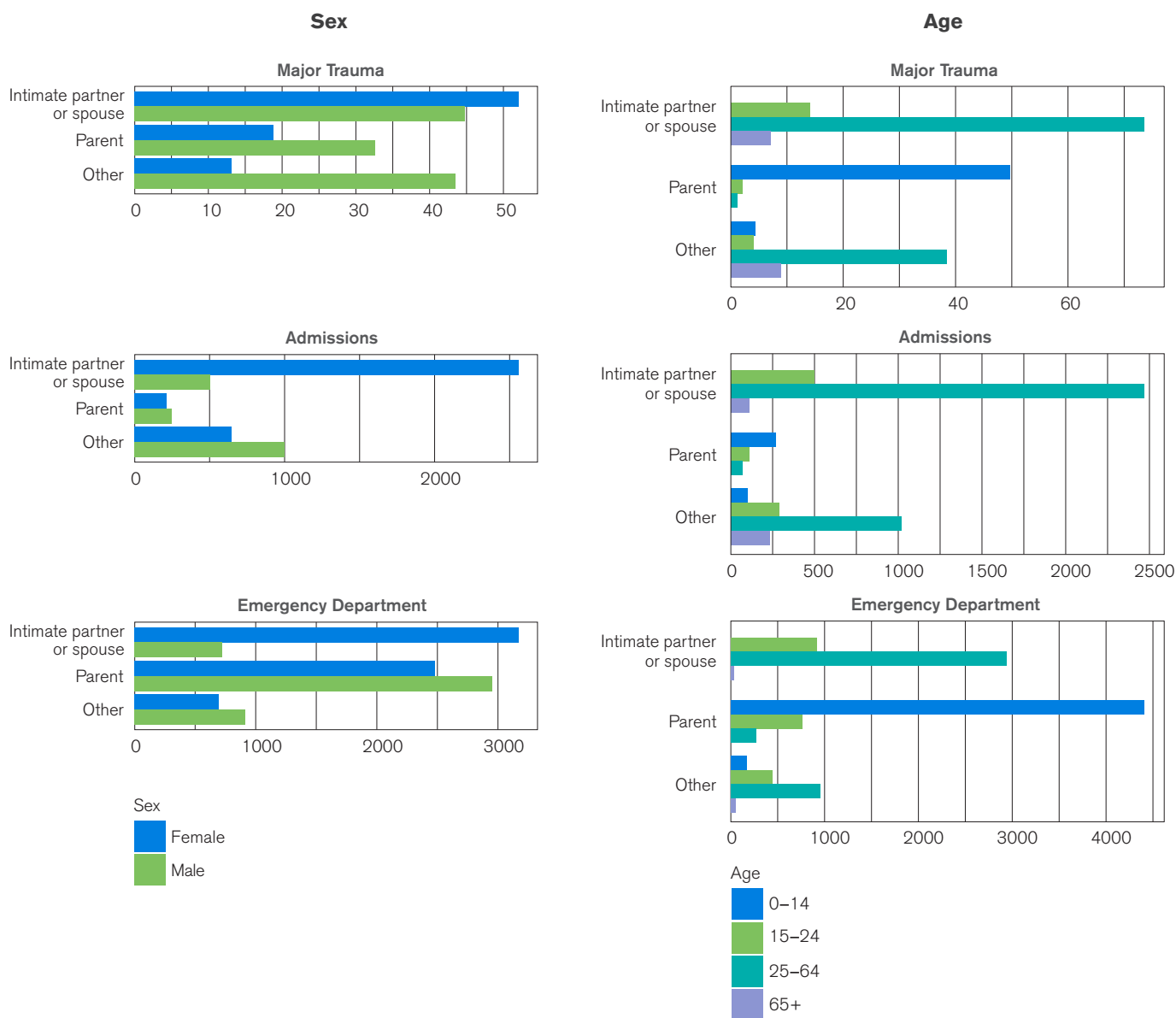
Assault by suffocation, strangulation or hanging accounted for less than one per cent of family violence-related emergency department presentations. Injuries of any type to the head were more common among assault-related (56 per cent) than family violence-related (32 per cent) presentations. Among family violence-related emergency department presentations who identified as Aboriginal or Torres Strait Islander, 42 per cent had sustained a head injury.

Identity of perpetrator

To enable comparison across categories, Figure 2 combines information presented in Annex B for each hospital dataset to show the type of perpetrator according to the age and sex of the victim. The term 'perpetrator' has been adopted for the purposes of analysis and refers to the alleged perpetrator of the injury leading to the victim's attendance at hospital.

While the sex of the victim is recorded in the hospital data, the sex of the alleged perpetrator is generally not recorded, although it has been determined from the text narratives for some aspects of major trauma cases.

Figure 2. Perpetrator type by hospital attendance category and age and sex of victim July 2006–June 2016



Note: Perpetrator type 'Other' denotes family members other than a parent or intimate partner/spouse, for example, a sibling, child, grandfather, uncle, nephew or carer.

Of all 16,296 family violence cases attending Victorian hospitals between July 2006 and June 2016, 43 per cent were injured by a spouse or domestic partner, 37 per cent were injured by a parent and 20 per cent were injured by another family member.

In cases where the family member alleged to have caused the patient's injuries was a spouse or domestic partner, 84 per cent of patients were female. In cases where the alleged perpetrator of injury was a parent or other family member, 56 per cent of patients were male.

Of the total number attending hospital for family violence-related reasons, 60 per cent (9,845) were female. Fifty-nine per cent of these females received their injuries from a spouse or domestic partner.

Figure 2 illustrates the differences between types of hospital attendance (major trauma, hospital admissions or emergency department presentations). Almost half (47 per cent or 45 cases)¹¹ of the victims of a spouse or domestic partner treated in major trauma were male, compared to 16 per cent (504 cases) for admissions and 19 per cent (720 cases) for emergency.

Overall, women comprised 84 per cent of all victims of a spouse or domestic partner. Victims where the parent was the perpetrator were more likely to be male across all types of hospital attendance, from 63 per cent (33 cases) in major trauma through to 54 per cent in each of admissions (248 cases) and emergency (2,951 cases).

Similarly, victims of another family member were also more likely to be male across all types of hospital attendance, from 77 per cent (44 cases) in major trauma through to 61 per cent (994 cases) in admissions and 57 per cent (913 cases) in emergency.

In major trauma cases, sibling and child perpetrators were mostly brothers (95 per cent or 19 out of 20 cases) and sons (89 per cent or 17 out of 19 cases)¹². Data were not available about the sex of perpetrators who were parents, as this information was not often included in the text narrative of the injury event.

Where the spouse or domestic partner was the perpetrator (7,060 cases), 76 per cent of victims were aged 25 to 64. Significant numbers of victims were aged 15 to 24 in 15 per cent (14 out of 94) of major trauma cases, 16 per cent (500 out of 3,075) hospital admissions and 24 per cent (920 out of 3,890) emergency department presentations.

Where a parent was the perpetrator, 94 per cent of victims in major trauma were under the age of 15 (50 out of 53). The majority of victims in hospital admissions (60 per cent or 270 out of 450) and emergency department presentations (81 per cent or 4,400 out of 5,430) were also children under the age of 15 although there was some representation in older age groups.

Of the 450 cases of hospital admissions where a parent was the perpetrator, 43 per cent of victims were under the age of five, with a further 35 per cent aged 10 to 24 years. Of all 5,430 emergency department presentations where a parent was the perpetrator, 69 per cent of victims were under the age of nine years.

Overall, children under the age of 15 represented 31 per cent of the total 16,296 hospital attendances for reasons of family violence.

11 The problem of perpetrator misattribution may impact these figures (see <http://whwest.org.au/police-response-to-family-violence/>, for example). The data shows the most common cause of family violence-related major trauma in people over the age of 14 years is penetrating trauma (most commonly with a kitchen knife) a scenario that could suggest an act of self-defence. Further examination of the data shows penetrating trauma was the mechanism of injury in 69 per cent (31) of male patients and 30 per cent (15) of female patients allegedly injured by their intimate partner/spouse.

12 This information was derived from a detailed examination of text narratives available for major trauma cases.



Long-term outcomes

The VSTR routinely follows up all major trauma patients who survive to hospital discharge at six, 12 and 24 months post-injury. Since follow up of paediatric patients only commenced in 2010, the number of paediatric family violence-related cases was too small for analysis. Similarly, the number of family violence-related brain injury cases was too small for analysis.

Long-term outcomes were analysed for 143 adult family violence-related major trauma cases and compared to the long-term outcomes for cases of major trauma resulting from accidents. The analysis showed that family violence-related cases demonstrated poorer function, lower odds of return to work, and higher prevalence of pain, anxiety and depression than major trauma cases injured in accidents. Health-related quality of life, and in particular, mental health, was significantly poorer in the family violence group.

Conclusion

Analysis of administrative health data has identified an average annual incidence of 0.37 family violence-related major trauma cases per 100,000 population, 9.3 family violence cases admitted to hospital per 100,000 population and 19.6 family violence cases presenting to emergency departments per 100,000 population. Using 2017 population figures for Victoria, these estimates of annual incidence translate to an estimated number of family violence-related cases of 1,240 emergency department presentations, 588 hospital admissions and 23 major trauma cases.

Grouping together all forms of hospital attendance for reasons of family violence (16,296 cases), children under the age of 15 represented 31 per cent (5,007) of cases and females represented 61 per cent (9,845) of cases. People identifying as Aboriginal or Torres Strait Islander were also disproportionately represented, comprising 6 per cent of family violence-related hospital admissions and 3 per cent of family violence-related emergency department presentations.

The number of people attending hospital for reasons of family violence is likely to be underestimated. For example, of 29,945 hospital admissions for assault in the period July 2006 to June 2016, 17 per cent (5,165) were identified as family violence-related. A further 49 per cent (14,667) of cases with an external cause code recorded the perpetrator as 'unspecified person'.

A PRE-EXISTING BRAIN INJURY CAN RESULT IN 'CHALLENGING BEHAVIOURS', SUCH AS AGGRESSION, WHICH, IF UNADDRESSED, MAY CONTRIBUTE TO THAT PERSON'S PROPENSITY TO PERPETRATE FAMILY VIOLENCE.



The systematic literature review located just three studies of the prevalence of brain injury among perpetrators of family violence.



Family members reported aggressive behaviour in brain injury patients following discharge from major trauma. These behaviours differed from their pre-injury personalities and persisted, and in a few cases deteriorated, over time.

2x

Two studies of male intimate partner aggression reported rates of brain injury of 61% and 58%, twice the rate of a comparison group. One study of female child maltreatment reported rates of brain injury of 36%, three times the rate of a comparison group.



While our analysis indicates that brain injury is a risk factor for family violence, it is not inevitable that a person with a brain injury becomes a perpetrator.



Further research is required to understand the interplay between brain injury and other factors known to influence the perpetration of family violence.



There is good evidence for the effectiveness of interventions, such as tailored services providing psychological support to the person with a brain injury and their family.

Brain injury among perpetrators of family violence

This section focuses on the issue of pre-existing brain injury associated with the perpetration of family violence. It draws on the academic literature and supplements this with practitioner perspectives. Hospital data has provided qualitative data on patients from major trauma who have sustained a severe brain injury and subsequently become perpetrators of family violence.

Literature review

Just three studies of perpetrators were located by the systematic literature review. These studies were of relatively small groups of perpetrators, both male and female, and reported brain injury as indicated by pre-screening or screening techniques rather than full diagnosis. (See Annex A.).

The two studies of male groups explored the relationship between brain injury and intimate partner aggression, whereas the study of a female group explored the relationship between brain injury and child maltreatment. These studies met the selection criteria for the systematic review, and while recognising that they do not represent the full spectrum of perpetration of family violence, they have examined the relationship between perpetration and brain injury.

Male intimate partner aggression

A United States study (Walling et al., 2012) compared a community sample of 102 male perpetrators of intimate partner aggression with 62 non-aggressive men. The study investigated head injury, executive functioning and intelligence as neuropsychological correlates of intimate partner aggression.

The study found that 61 per cent of men reporting to an intimate partner aggression program reported head injury. Men with a history of intimate partner aggression were twice as likely to report a head injury as non-aggressive men.

The results indicated that 'a history of head injury and lower mean score on a measure of verbal intelligence were associated with the frequency of male-perpetrated physical intimate partner aggression as reported by male perpetrators and their female partners. Lower mean scores on a measure of verbal intelligence also predicted frequency of perpetration of psychological intimate partner aggression.' However, the authors caution against considering the contribution of head injury to intimate partner aggression in isolation from the range of complex interrelationships between environmental, biological and individual differences at play¹³.

A New Zealand study (Marsh and Martinovitch, 2006) explored the prevalence of executive dysfunctions (a common result of TBI) in 38 men with criminal convictions for violence, who were in a treatment program for partner abuse.

The study explored the suggestion that 'impairment in executive functions may facilitate aggression and violent behaviour [given that] executive dysfunctions have been linked with both brain injury and violent behaviour, especially in situations that are stressful, precarious, frustrating or provocative.' A medical history interview was conducted and TBI severity was assessed by self-reported duration of loss of consciousness.

Twenty-two (58 per cent) of the men reported a history of brain injury and had a lower average IQ and reduced cognitive functioning, when compared to the 16 men with no reported brain injury. The study referred to similar rates of brain injury (62 per cent and 53 per cent) determined by other studies of convicted male spouse abusers.

The self-reported rates of head injury in male perpetrators of intimate partner violence found in the US study and the New Zealand study are consistent with the findings of a recent Australian study (Perkes et al., 2011).

This study compared a group of 200 male prisoners with a matched (by sex and location of usual residence) community sample and found that at least one TBI with loss of consciousness was reported by 64.5 per cent of prisoners and 32.2 per cent of matched community participants.

13 A person with a brain injury may, through their disability, be at increased risk of becoming a victim of family violence, as noted by the Royal Commission into Family Violence.

Female child maltreatment

A New Zealand study (McKinlay et al., 2014) examined reported TBI among a group of 206 mothers who had been referred to a child abuse prevention program. The study aimed to 'examine reports of a traumatic brain injury history for parents identified at a high risk of engaging in child abuse or neglect as this may impact both on their ability to parent and their ability to benefit from treatment programs.' The study found a prevalence of TBI of 36.4 per cent, more than three times the rate found in a community sample of women the same age. Of the mothers reporting TBI, 58.7 per cent had experienced their first brain injury prior to age 16.

Practitioner perspectives

Practitioner perceptions, drawn from interviews conducted as part of this study, support a positive association between brain injury and perpetration of family violence. For example, practitioners from acquired brain injury services estimate that between 40 per cent and 60 per cent of clients may have experienced family violence related to their brain injury, although most of these are victims, and only a few are perpetrators¹⁴. (See Annex C.)

In separate discussions, the Court Support and Diversion Service worked with repeat offenders with a cognitive impairment, of whom a proportion (anecdotal estimate is around 25 per cent) are family violence-related. It is important to note that while some of this group are perpetrators of family violence, others are victims of family violence who have perpetrated different types of crimes, such as stealing (Magistrates' Court of Victoria, 2018).

Diverge Consulting, a brain injury support service, reports working with clients and their families and support networks to reduce the likelihood and impact of family violence following brain injury. Post-injury assistance extends to identifying those at risk of becoming victims of family violence, such as through financial abuse from a family member (Diverge Consulting, 2018).

Lived experience

The RESTORE qualitative study of major trauma patients in the first five years after injury provides longitudinal data on patient outcomes (see Approach chapter). The study included 20 interviews with eight people with brain injury, who went on to perpetrate family violence post-injury. Four of these were male, and four were female. At the time of their injury, two of the eight were under 16 years old (interviews were held with their guardians), and the remaining six were over 16 years old (interviews were held with family members for five of the cases and with the injured person for the other one). (See Annex B.)

The themes identified in the interviews are given in Table 2.

Table 2. Themes described by those who sustained a severe TBI and became perpetrators of family violence

Theme	Sub-theme
Behaviour changes post severe TBI	Aggression following severe TBI Triggers for aggressive behaviour
Outcomes of aggressive behaviours	Altered social dynamics & family impacts Restricted freedoms Housing issues
Variable effectiveness of services	n/a

¹⁴ Information is not available on the extent to which brain injury acquired through family violence may contribute to future perpetration.

Family members described all adult and child participants as displaying verbally aggressive behaviours after their brain injury. Verbal aggression was described as 'threatening', 'screaming', 'frightening' and 'abusive' and was sometimes physically manifested by damaging property.

Most family members reported that these behaviours were in contrast to the pre-injury personalities of the participants. Aggressive behaviours persisted, and in a few cases deteriorated, over time. Only the guardians of children reported physical abuse to another person, who was typically the parent or sibling of the child with brain injury.¹⁵



'I'm afraid of her. I'm really frightened of her. She makes threats. She'll break a door... but she is far more out of control now... she's a very frightening person to be with.'

'He just can't control himself and then he gets frustrated and then he gets angry... since the head injury, like he always had that problem of trying to understand stuff, he just couldn't work it out in his head. We understood that because we knew about the injuries, but it's developed into something really bad.'

15 See <https://aifs.gov.au/cfca/2015/12/08/adolescent-violence-home-how-it-different-adult-family-violence> for an explanation of adolescent violence in the home.

Triggers for aggressive behaviour were identified as frustration, difficulties in communicating or understanding, fatigue and poor impulse control. Many family members stated they could not live with their relative due to their aggressive behaviours. Some adult participants subsequently struggled to find and retain appropriate places of residence. Family members reported distress over making decisions that meant their relative could no longer live with them.

Owing to aggressive behaviours, some adults with brain injury were refused services and freedoms. Two family members described taking out intervention orders, and reported their relative being banned from places of business, prosecuted for offences, and/or refused healthcare services. One person with brain injury commented on the benefit of psychological services in managing aggressive behaviours.



'It's so hard because he sort of... he's more abusive and threatening to the family than he is to outsiders, and that's why quite a few of his sisters have backed off, and they've stopped helping him.'

'Because at times he can't hear what they're saying he gets aggravated... or he misunderstood, or he mix up a bit and the rest of it is lost. And that's when misunderstandings and problems happen.'

'(The psychologist) gives me techniques on how to distract and calm myself down while that person's annoying the hell out of me. And also... just giving me a third-point perspective. She helps... with my anxiety, but we've figured it out, it's anger that I have, not anxiety.'

Conclusion

Although there are few studies of the prevalence of brain injury among perpetrators of family violence, the evidence available indicates that rates of brain injury are disproportionately high in perpetrators of family violence, compared with matched non-violent community samples and the general population.

Studies have found that the rate of brain injury among samples of male perpetrators of intimate partner violence is around 60 per cent, and that this is double the rate found in matched community samples. Similarly, the rate of brain injury among a sample of mothers at risk of child maltreatment is around 36 per cent, which is more than triple the rate found in a community sample of women the same age.

While our analysis indicates that brain injury is a risk factor for family violence, it is not inevitable that a person with a brain injury becomes a perpetrator. Further research is required to understand the interplay between brain injury and other factors known to influence the perpetration of family violence. There is good evidence for the effectiveness of interventions, such as tailored services providing psychological support to the person with a brain injury and their family.

PEOPLE WHO ARE ALREADY VICTIMS OF FAMILY VIOLENCE ARE AT RISK OF SUSTAINING A BRAIN INJURY. IN THIS GROUP, WOMEN AND CHILDREN HAVE GREATER VULNERABILITY TO BRAIN INJURY, INCLUDING THE CUMULATIVE EFFECTS OF MILD INJURIES, ESPECIALLY WHEN THE BRAIN ISN'T ALLOWED SUFFICIENT TIME TO REPAIR AND RECOVER.

Of 16,296 people presenting at Victorian hospitals between July 2006 and June 2016 for family violence reasons, brain injuries were sustained by:

57%

Major trauma cases

54%

Hospital admissions

32%

Emergency department presentations



14% of major trauma cases with a serious brain injury died during their hospital stay, compared to 2.9% of cases without serious brain injury.

61

new cases of permanent disability related to brain injury will be added each year as a result of family violence-related admissions to Victorian hospitals.



Among family violence-related emergency department presentations who identified as Aboriginal or Torres Strait Islander, 42% sustained a brain injury.

Brain injury among victims of family violence

This section focuses on brain injury sustained by victims of family violence. It draws on the academic literature and hospital data, and supplements this with practitioner perspectives and patient experiences.

Literature review

Separate studies of adult victims of family violence report rates of head injury with loss of consciousness from hospital presentations (30 per cent), shelters (40 per cent) and non-sexual interpersonal violence (56 per cent). Administration of a screening questionnaire reported a history of interpersonal violence-related hits to the head or face in around 90 per cent of victims attending family violence shelters.

Neuropsychological assessment diagnosed brain injury in 74 per cent of victims attending family violence shelters. The literature notes that concussion or mild TBI is rarely diagnosed in adult victims of family violence. For example, one study reports that although 80 per cent of female victims seeking medical assistance for intimate partner violence-related injuries have sustained facial injuries, the potential for TBI is often overlooked (Banks, 2007). (See Annex A.)

Formal diagnoses are more available for children and infants, although the studies identified by the literature review cover different countries, and so may not be comparable. Nonetheless, the literature indicates a strong association between child abuse and brain injury.

For those children attending hospital for brain injury, several studies report abuse. For example, a US study reports that in 39.2 per cent of cases where children under 18 years of age were admitted to hospital for brain injury, the cause was abuse (Leventhal and Gaither, 2012). Figures available for the incidence of brain injury and child abuse indicate a higher risk of injury among children less than one year old (Sibert et al., 2002).

Hospital data

Analysis of Victorian hospital data for all family violence-related cases over the 10-year period from July 2006 to June 2016 is provided in the chapter on Prevalence of family violence. A similar analysis addressed to the subset of cases involving brain injury (see the Approach chapter for the definitions used) is presented below. (See Annex B.)

Major trauma

Fifty-seven per cent of 203 family violence-related major trauma cases had sustained a head injury, and in 86 per cent of these cases, the TBI sustained was 'serious', involving an intracranial injury and/or skull fracture.

Compared with family violence cases without serious brain injury (103 cases) where 11 per cent of victims were children under 15 years of age, 43 per cent of the 100 serious brain injury cases were children. As a consequence, a higher proportion of the serious brain injury cases involved parent perpetrators (40 per cent) compared with cases without a serious brain injury (13 per cent).

A higher proportion (48 per cent) of family violence cases with serious brain injury were female, compared with 33 per cent without serious brain injury. Otherwise, cases of family violence with and without serious brain injury were similar in terms of their socioeconomic status, geographic region of residence and preferred language spoken.

In terms of outcome, 38 per cent of family violence cases with serious brain injury had an Injury Severity Score¹⁶ greater than 24, compared to only 13 per cent of cases without a serious brain injury. Fourteen per cent of family violence-related major trauma cases with a serious brain injury died during their hospital stay, compared to 2.9 per cent of cases without serious brain injury, and the rate of discharge to inpatient rehabilitation was also higher (23 per cent compared with four per cent).

Key points: review article (Banks, 2007)

- *More than 80 per cent of female victims of intimate partner violence, presenting in emergency departments or primary care, have received facial injuries.*
- *Mild TBI is seldom diagnosed in victims.*
- *There is little literature about brain injury as a consequence of intimate partner violence.*
- *Mild TBI symptoms vary considerably in manifestation and intensity, but most are amenable to rehabilitation.*
- *Appropriate assessment and rehabilitation, as a foundation for other interventions, can be critical in breaking the cycle of abuse and violence.*

16 The Injury Severity Score (ISS) is an established score to assess the overall severity of a person's injuries. Major trauma is defined if the Injury Severity Score is greater than 12.

Hospital admissions

Fifty-four per cent of 5,165 family violence-related hospital admissions, were diagnosed with brain injury.

In general, the characteristics of those with a brain injury were similar to those without a brain injury. Compared with family violence cases without brain injury, a higher proportion of patients with a brain injury were aged 25 to 64 years (72 per cent compared with 65 per cent). Correspondingly lower proportions of family violence cases with brain injury were children under the age of 15 (5.6 per cent compared with 8.9 per cent) and adults over the age of 65 (4.9 per cent compared with 8.5 per cent). There was a slightly higher proportion of females in the family violence cases with brain injury than without brain injury (68 per cent compared with 65 per cent).

Socio-economic disadvantage (SEIFA quintiles 4 and 5¹⁷) was more common in cases with brain injury than those without brain injury (36 per cent compared with 31 per cent). Otherwise, cases of family violence with and without brain injury were similar in terms of their geographic region and preferred language status.

Emergency department presentations

Thirty-two per cent of 10,928 family violence-related presentations to the emergency department were diagnosed with brain injury, compared with 56 per cent in other assault presentations. Similarly, assaults involving the head, face or neck represented 35 per cent of family violence-related assaults and 58 per cent of other assaults.

Family violence-related presentations with brain injury involved 49 per cent of patients aged 25 to 64 years, compared with 33 per cent of those without brain injury. Children under the age of 15 represented 30 per cent of family violence-related presentations with brain injury compared with 48 per cent of those without brain injury.

More patients from rural and regional areas were represented in family violence-related presentations with brain injury (23 per cent) compared with those without brain injury (18 per cent).

Practitioner perspectives

Drawn from interviews (see Annex C), practitioners recognise a proportion of victims of family violence as showing signs of, or having a diagnosis of, brain injury. However, practitioners report that no formal screening measures are in place, and data is not available on the potential for brain injury among their clients.



'I've seen a lot of women who I would think were very clever in their younger day, married very young and then were psychologically chipped away at over a period of 10, 20, 30, maybe 40 years. They can't put two words together and fear is what they feed on from day to day. A lot of them don't eat. The violence can be drug use, extensive drug use. We've got a lot of women who've come in who are addicted to drugs, the continuous assaults, head injuries, ear, inner ear, hearing, jaws being broken.'

17 The Australian Bureau of Statistics (ABS) produces measures called Socio-Economic Indexes for Areas (SEIFA), which compare the relative social and economic conditions of cities, towns and suburbs across Australia.

Similarly, formal screening and recordkeeping for family violence is reportedly not undertaken by specialist brain injury services. However, practitioners in those services provide anecdotal accounts of brain injury sustained through family violence.

Lived experience

The RESTORE qualitative study of major trauma patients in the first five years after injury provides longitudinal data on patient outcomes. The study included 10 interviews with five cases of moderate-to-severe TBI sustained through family violence (see Annex B). Four of these were female and one was male.

At the time of their injury, two of the five were under 16 years old (interviews were held with their guardians) and the remaining three were over 16 years old (interviews were held with the injured person). Of the adult participants, two of the three did not report a history of violence. The events that caused the brain injury were reported to occur without warning.

All participants described emotional, mental, physical and cognitive issues in the first five years after injury. The themes identified in the interviews are given in Table 3.

Table 3. Themes described by participants with a moderate-to-severe TBI through family violence

Theme	Sub-theme
Persistent disability	Emotional and mental health issues
	Persistent pain
	Physical and functional issues
	Cognitive issues
	General health changes
	Adjustments over time
Significant losses from injuries sustained and from the cause of the injuries	Loss of a previous life
	Loss and changes in significant relationships
	Reduction in social networks
	Activity restrictions
	Career and financial losses
	Future losses
Challenges encountered when engaging with systems	Unique circumstances unrecognised by bureaucratic systems
	Struggling to manage in bureaucratic systems
	Communication issues within and across systems
	Service access issues

Guardians reported that children often displayed intermittent emotional 'outbursts', 'meltdowns' and 'tantrums'. Fatigue, loud noises, and crowds were identified as triggers. Adults reported persistent pain, and physical and functional issues.

All the adult participants reflected on and made comparisons to their pre-injury life, referencing the changes and reduction in quality of life post injury.



'Actually, I have a lot of arguments with my children and I know it was my fault because of my situation. My physical and mental status brought that... I can see after what happened that it's my fault... I can't control myself.'

'She's very emotional... Just dissolves into tears for no real reason. I've been seeing the neuropsychologist and a lot of that they reckon it is fatigue, kids with an acquired brain injury do tire much easier than another five-year-old.'

The injuries sustained and the cause of the injuries had significant consequences for families and close personal relationships. Adult participants all reported poor mental health and wavering emotions, which contributed to emotionally unstable home environments.

Guardians described that until children commenced school, young injured children spent large amounts of time with adults. Physical disability or the risk of injury, fatigue and behavioural issues restricted opportunities to build social networks with other children. Guardians predicted that children would never achieve full independence.

'She'll never recover from her cerebral palsy, it's a lifelong disability... Unfortunately, she'll never walk unassisted... which affects a lot of things, not just the walking. It will affect the toileting, the bathing, the getting in and out of bed.'

Long-term outcomes

The number of family violence-related brain injury cases in the VSTR was too small for analysis of long-term outcomes in major trauma patients (see the Prevalence of family violence chapter).

Based on the data available for hospital admissions, an estimate has been made of the number of cases of family violence-related brain injury who may be expected to experience lifelong disability from their injury (see Annex B).

The Validating and Improving Injury Burden Estimates Study (Injury-VIBES) (Gabbe, 2018) used data from 40,000 injured participants in six countries to generate disability weights, based on the proportion of each ICD-10-AM diagnosis code (skull fracture or intracranial injury) who reported continued limitations on the three-level EQ-5D health status measure at 12 months post injury (van Reenan and Oppe, 2015).

The 5,165 cases of family violence-related hospital admission were searched for TBI diagnosis codes. Where more than one diagnosis code was allocated, the code with the highest prevalence of disability was used. The injury-VIBES disability weights were applied to the selected cases and the figure adjusted to provide an annual estimate of the incidence of persistent disability resulting from family violence-related brain injury cases admitted to hospital in Victoria.

Using this method, an estimated 61 cases per year of family violence-related hospital admissions in Victoria were expected to have permanent problems related to brain injury. The potential for undercounting family violence-related hospital admissions is high, since 49 per cent of hospital admissions for assault with an external cause code recorded the alleged perpetrator of the injury as 'unspecified person'.

Similarly, this analysis has focused on specific diagnosis codes related to intracranial injury or skull fracture, so that the estimate of cases expected to have permanent problems related to brain injury sustained through family violence is likely to be a lower bound.

Conclusion

Around 40 per cent (6,409 cases) of family violence-related attendances at Victorian hospitals between July 2006 and June 2016 were diagnosed with brain injury, made up of:

- *57 per cent (116) of 203 major trauma cases*
- *54 per cent (2,774) of 5,165 hospital admissions*
- *32 per cent (3,519) of 10,928 emergency department presentations.*

In family violence-related major trauma cases, brain injury was associated with 14 of the 17 deaths over the 10-year period. Brain injury was also a factor in the majority of cases of children attending major trauma for reasons of family violence.

An estimated additional 61 Victorians each year, who have been admitted to hospital for family violence-related injury, can be expected to experience permanent problems related to brain injury.

For the majority of family violence victims who do not attend hospital, information derived from the academic literature suggests that a significant proportion of family violence cases (between 30 per cent and 74 per cent) may sustain brain injuries.

Further research is required to establish the risk of and prevalence of brain injury among this much-larger group of victims of family violence, and the role of evidence-based interventions.

INTERVENTIONS WITH THE GREATEST POTENTIAL TO REDUCE THE IMPACT OF BRAIN INJURY ASSOCIATED WITH FAMILY VIOLENCE FOCUS ON SCREENING AND DIAGNOSIS, AND GUIDANCE ON HARM PREVENTION, REHABILITATION AND RECOVERY.



Practitioners report a low level of awareness of brain injury throughout the integrated family violence service system.



Practitioners working in family violence settings report difficulty accessing appropriate diagnosis for suspected brain injury in their clients.



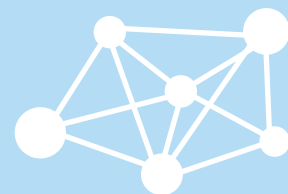
Formal diagnosis is vital to accessing a range of important supports, such as extended family violence case management funding.



There is no guidance available for family violence practitioners on how to follow up on a client's potential for brain injury – what further questions to ask, and how and why to make a referral for a clinical assessment and diagnosis.



Even without the compounding circumstances of family violence, people with prolonged symptoms following concussion or mild TBI report difficulty in obtaining appropriate guidance and support to aid their recovery and adaptation.



Service gaps include:

- provision of initial advice and guidance following identification of a potential brain injury
- making appropriate referral for formal diagnosis if appropriate
- adapting the services and supports provided to suit the client's brain injury difficulties.

Needs analysis

Interviews were conducted with 26 practitioners involved in the integrated family violence system, including specialist family violence services, child and family services, perpetrator intervention services, and related health and justice sectors. (See Annex C.)

Interviewees had experience of working with men, women and children across:

- crisis (short-term intervention)
- case management (longer-term intervention)
- health (community/GP, acute, rehabilitation)
- justice
- rural and urban
- housing
- migrants and culturally and linguistically diverse (CALD) groups.

This information has been supplemented by further discussions and practitioner workshops focused on interventions.

Identifying brain injury

Interviewees identified a number of barriers to identifying cases of brain injury associated with family violence.

Limited practitioner awareness

Practitioners report a low level of awareness of brain injury throughout the integrated family violence service system. Those who are aware of the potential for brain injury rely on their individual awareness of indicators, such as memory loss and multiple trauma, to alert them to the potential for brain injury in a client.

Once identified, there is no formal system for recording or following through on brain injury concerns. For example, the current risk assessment framework does not include indicators or 'flags' for brain injury. There is also no guidance available for family violence practitioners on how to follow up on a client's potential for brain injury – what further questions to ask, and how and why to make a referral for a clinical assessment and diagnosis.



'I think knowledge of brain injury is a huge gap because I've had a fairly broad background and didn't think about all of that... I've worked with a lot of women who have had facial injuries and head injuries but I've understood it as broken bones that may be repaired. I never thought about it from is there a brain injury there. So I think number one, is knowledge of brain injury and how it occurs, and then knowledge of good partnerships with services that can work towards [diagnosis and follow up care].'

'Men tend to punch upwards to the head... If the woman falls on the ground, it's generally kicking into the torso...They do get kicked in the head a lot.'

'Brain injury I think is really misunderstood and not even really thought about much.'

Many practitioners working in family violence settings report difficulty in understanding how to distinguish potential brain injury from multiple other issues, such as post-traumatic stress disorder and drug and alcohol abuse.

Practitioners also find it difficult to allocate attention to a potential for brain injury in what is essentially a triage situation where the primary concern is client safety. They are also reluctant to cause alarm to their client by suggesting the possibility of brain injury without providing any relevant advice or support.

Health practitioners report similar knowledge gaps in relation to indicators of family violence¹⁸. Work is currently underway to address this, following the Royal Commission into Family Violence Recommendation 95: 'The Victorian Government resources public hospitals to implement a whole-of-hospital model for responding to family violence, drawing on evaluated approaches in Victoria and elsewhere', and Recommendation 103: 'The Victorian Government, through its membership of the Australian Health Workforce Ministerial Council, encourage the Ministerial Council to approve standards that facilitate a mandatory requirement that general practitioners complete family violence training as part of their continuing professional development'.



'Obviously the focus is on safety and reducing the violence. It's not actually writing a formal evaluation [or referral] of anything.'

'The social worker actually asked her straight out if there was family violence involved, which she denied. It was something we had all suspected based on past presentations as well as the [current] presentation and the injuries that she had ...I guess patients are sometimes not willing to answer questions.'

18 Successful models include the Royal Children's Hospital, where cases are reassessed for family violence every 24 hours.

Resistance to brain injury identification

Family violence practitioners report that clients may be resistant to having brain injury identified. For adult victims, this resistance may stem from a fear that they will lose custody of their children. For both victims and perpetrators, there may be stigma attached to a suggestion that someone has a brain injury or a disability resulting from family violence.

This can be a heightened concern in more vulnerable groups. For example, in migrant or CALD populations, an adult victim may be more extensively reliant on their spouse due to visa restrictions, or where interpreters may be known to the client and their family.



'[The threats from the partner are] most often it's things like - I've spoken to the child protection and they're going to come and take your kids away because you're a bad mother.'

'Sometimes they don't want to access family violence support through [specific service] because they know that their cousin or aunty or somebody is there.'

'Fear of being deported, fear that their children will be taken away from them, fear that they won't be able to support themselves; and that comes to the whole financial issue.'

Brain injury diagnosis

Interviewees identified a number of barriers to obtaining a diagnosis of brain injury associated with family violence.

Need for diagnosis

Formal diagnosis is vital to accessing a range of important supports, such as extended family violence case management funding (26 weeks extended from 13 weeks). Assistance may also be available from other agencies on diagnosis, including the Victims of Crime Assistance Tribunal, Centrelink and the National Disability Insurance Scheme.



‘So with the advent of the NDIS, we’ve come up against that quite a lot, where it would be great for the clients to have the NDIS, but we just can’t get them to get a diagnosis of a brain injury because the waitlist is too long and we can’t pay for it, we don’t have enough money.’

Difficulty accessing diagnosis

Practitioners working in family violence settings report difficulty accessing appropriate diagnosis for suspected brain injury in their clients. These difficulties extend across knowledge of appropriate referral points and service availability, general practitioner (GP) knowledge and awareness of concussion and mild TBI, and the costs of comprehensive neuropsychological assessment.

‘We face six months waiting lists at the minimum – probably 12 months – to get a neuropsychological assessment done and then you have to pay in excess of \$1,500. We just do not have that funding.’

‘But what I’ve noticed too is a lot of women with brain injuries aren’t taken seriously by the medical profession. It is assumed that they’re drug affected and part of my role is to actually go to doctor appointments with our clients to advocate on [their] behalf that they’re not drug affected, they are unwell.’

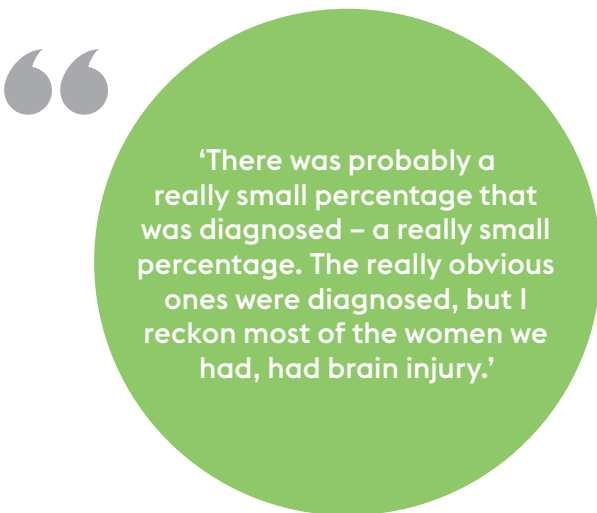
Practitioners also emphasise the challenges of obtaining appropriate GP support in the context of family violence.

In support of these observations, Brain Injury Australia (Knox et al., 2017) estimates around 2,000 to 3,000 Australians experience prolonged symptoms following concussion or mild TBI each year. These symptoms are sufficiently debilitating to prevent people from working and carrying out the normal activities of living and socialising, generally for around 12 months, but in a substantial proportion of cases, for much longer.

Even without the compounding circumstances of family violence, people with prolonged symptoms following concussion or mild TBI report difficulty in obtaining appropriate guidance and support to aid their recovery and adaptation.

In response to the same challenges, the Court Support and Diversion Service of the Magistrates' Court of Victoria has established a tailored neuropsychology service as part of their successful intervention activities dealing with repeat offenders who exhibit signs of cognitive impairment. Again, in this case, formal diagnosis is essential to access and inform expanded support in the form of non-custodial arrangements and intensive case management.

Even if appropriate services were to be available, practitioners observe that victims of family violence face additional barriers to those mentioned above (resistance to diagnosis). These span difficulties experienced with brain injury (remembering appointments, working out how to travel to a new place and the costs of travel) to difficulties attached to family violence (repeat abuse/injury, low attention to personal health needs and priorities, lack of a support person to help take information in and low health literacy).



‘There was probably a really small percentage that was diagnosed – a really small percentage. The really obvious ones were diagnosed, but I reckon most of the women we had, had brain injury.’

Integrated specialist supports

Interviewees report significant gaps, relating to specialist services focused on family violence and those focused on brain injury.

Specialist family violence supports

Given the lack of current referral pathways for brain injury available to family violence services, practitioners report frustration about their lack of capacity to provide appropriate support to their clients.

These service gaps include:

- provision of initial advice and guidance following identification of a potential brain injury
- making appropriate referral for formal diagnosis if appropriate
- adapting the services and supports provided to suit the client's brain injury difficulties.

Practitioners also report the difficulties faced by clients with brain injury in navigating services. A survey conducted by Brain Injury Australia in 2017 identified that people with a brain injury experience extreme difficulty and frustration when interacting with necessary services, such as Centrelink (Brain Injury Australia, 2017).



'It might be that he might disclose that he's got an acquired brain injury. Now what do we do with that...?'

'The men, many of whom had experienced family violence from a young age and many of whom went on then to become perpetrators of violence. Which in the context of their ABIs, became quite challenging to manage because of the symptoms of ABI; reduced consequential decision-making, the heightened aggression, those things that can mean that a situation escalates more quickly. They can appear more intimidating and aggressive as a result of their disability.'

'We found often that they had lots of complex health needs, so their acquired brain injury was part of [other] issues that they had... with mental health, with substance abuse, housing and homelessness...'

'The lack of safe, affordable housing and navigating a system like that when you have an acquired brain injury – even more difficult and huge bureaucracy to find your way around.'

Practitioners highlighted the possible connection between childhood experiences and adult perpetration of family violence. The potential for unaddressed brain injury and family violence experiences in childhood to play a role in promoting intergenerational family violence is also noted in the literature (Campo, 2015).

'[They experienced] extreme neglect and abuse as a child, acquired brain injury from beatings and continued brain damage from alcohol misuse.'

'So a majority, and I would say a very, very high majority [of perpetrators], really 80 per cent, have been exposed to family violence themselves.'

Specialist brain injury supports

Practitioners from all sectors reported the increased difficulty of obtaining specialist brain injury supports during the transition period to the National Disability Insurance Scheme. Services that were already stretched have been further reduced as their capacity to move from block funding to case funding has been challenged.

The issue of service gaps around prison release was raised, for example, where National Disability Insurance Scheme funding is not available to prisoners, and this and related support services can only be applied for post release.

A promising integrated model is found in the Court Support and Diversion Service, which has developed a capacity to scope and adjust the neuropsychology services to meet the needs of clients and the interrelated, but separate, systems they face. For example, based on experience, the service added a 'debrief to client' to the cognitive impairment assessment to help repeat offenders understand their diagnosis.

The neuropsychological assessment also produces a briefing document to help the various court services (for example, magistrates, men's behaviour change, social work and mental health) working with the client to understand what can be achieved, and how to achieve it in the specific context of this person's brain injury. The integrated supports provided within the Court Support and Diversion Service help to establish a bridge to longer-term services and supports, such as housing, brain injury services and the National Disability Insurance Scheme.



'The age seems to be dropping at the moment. We're getting more women that have been exposed to a cumulative amount of level of violence over a longer period of time from a younger age, that are experiencing ABIs at an earlier age. It's maybe three or four years of really severe violence and they're only 24. So I've got one client... She's in her early 30s and had a significant history [of family violence] but quite a significant injury regarding her brain.'

'Not all people with a brain injury use family violence. So obviously, it's not a foregone conclusion that that happens... I don't believe that giving you an acquired brain injury leads you to become violent. I think it's there to start with and then they are limited in their strategies for coping with life.'

'There was a woman that I dealt with and worked with for quite a long period of time and it was about her comprehension. The woman I've got at the moment, it's about her memory, it's about her ability to do menial tasks.'

Summary of needs

The body of work presented in this report draws on and brings together multiple lines of inquiry. The Royal Commission made 227 recommendations, of which 43 have been identified as having relevance to the challenge of intervening on brain injury (see Appendix A). The rationale for potential interventions to reduce the impact of brain injury associated with family violence is provided in Appendix B.

The resulting list of interventions has been prepared with the input of stakeholders, including consultations with members of Domestic Violence Victoria and No to Violence incorporating the Men's Referral Service.

The three main groups of people for whom brain injury may be associated with family violence are:

- people with a pre-existing brain injury who are more prone to perpetrate family violence because of their challenging behaviours and other stressors related to their injury
- people with a pre-existing brain injury who are more vulnerable to family violence because of their disability and loss of independence
- victims of family violence (adults and children) who are vulnerable to brain injury through physical abuse, including strangulation and repeated abuse.

The needs of these groups of people who may be affected by brain injury and family violence are discussed in detail in Appendix B.

Avoidable costs

Brain injury requiring hospitalisation can lead to permanent disability with associated increased risk of becoming a victim of family violence. People who have sustained a severe or moderate TBI may also develop challenging behaviours, which have the potential to contribute to perpetration of family violence.

A 2009 Access Economics report commissioned by the Victorian Neurotrauma Initiative found that the annual total cost to Victoria of an estimated 370 new cases of moderate TBI and 248 new cases of severe TBI across all age groups and external causes was \$2.2 billion, the greatest portions borne by individuals (66.8 per cent), then the State Government (19.2 per cent), and the Federal Government (9.7 per cent).

Even in its milder forms, brain injury can require extended recovery times, with impacts on employment, parenting capacity, relationships and day-to-day living. These impacts can be enduring. For example, a period of unemployment can create additional financial stress and erode future employment prospects.

During the recovery period, tasks that are usually simple, such as planning, can be challenging. Without appropriate support and guidance, recovery may be hampered and coping strategies unnecessarily limited. Over time, the specific vulnerabilities introduced by brain injury can increase the risk of further family violence.

Identification and provision of appropriate support for people with brain injury experienced in association with family violence may provide a new and powerful opportunity to interrupt the cycle, and minimise the impacts and costs involved.

A number of studies have estimated the avoidable costs of family violence in Australia and Victoria. A 2009 Access Economics report defined seven areas of avoidable cost in family violence.

They are:

- pain, suffering and premature death
- health costs
- production-related costs
- consumption costs
- second generation costs
- administrative and other costs
- transfers.

These have since been updated, with a 2015 estimate by PricewaterhouseCoopers that the cost of violence against women in Australia was \$21.7bn per year, and a 2017 estimate by KPMG that the cost of family violence in Victoria was \$5.3bn in 2015–16. Excepting consumption costs, costs in all categories attributable to family violence would be increased by the presence of brain injury.

Further, the academic literature suggests that the experience of childhood abuse appears to be a contributory factor for both victims and perpetrators of family violence as adults (Smith-Marek et al., 2015). The intergenerational transmission of family violence is an effect acknowledged by practitioners and researchers in the field, although the nature and extent of it is still being explored.

Interventions

Interventions with the greatest potential to reduce the impact of brain injury associated with family violence focus on screening and diagnosis, and guidance on harm prevention, rehabilitation and recovery.

Screening and diagnosis

Screening

Screening can take place at three levels of accuracy (see Annex A), being:

- pre-screening – involving a few indicative questions regarding a person's potential to have experienced a brain injury (for example, the number of times they have lost consciousness following a blow or fall, and whether they have been strangled)
- screening – involving a brief assessment including, for example, a test of short-term memory, as used in many hospital emergency departments
- diagnosis – involving a comprehensive assessment by a specialist clinician, typically a neuropsychologist, extending over a few hours.

Both pre-screening and screening activities are helpful in:

- providing more comprehensive indications of the potential for brain injury in a particular case, in order to further assess and manage family violence risks
- assisting with provision of immediate guidance and information resources to victims and perpetrators, for the purpose of increased awareness and risk reduction
- raising awareness of practitioners working in family violence settings, and providing them with appropriate information resources to alert them to the potential risks of specific cases and the possible additional needs of their clients, regarding planning and communication
- identifying cases that may benefit from comprehensive diagnosis and specialist support
- tracking the results of campaigns aimed at increasing awareness of the potential for brain injury as a result of family violence.

Screening for potential brain injury in either victims or perpetrators of family violence introduces new knowledge and a related responsibility to follow through with information, care and support.

Diagnosis

For a person experiencing brain injury, access to specialist healthcare and neuropsychology services is required to provide them with:

- an accurate diagnosis so that they, and their practitioner supports, can understand the nature of their impairment and their needs for recovery and coping, and can integrate this knowledge with the rest of their life and family violence planning
- ongoing connection with appropriate services and supports
- access to additional sources of funding to support their treatment and recovery
- access to medical certificates and additional financial support (for example, to cover temporary inability to work).

Guidance on harm prevention, rehabilitation and recovery

Evidence-based information resources, complemented by practice experience developed through their use, can inform family violence prevention programs. The available evidence (see Annexes A, B and C) can help target these prevention activities to high-risk groups (for example, pregnancy, multiple or premature births, and young or single parents)¹⁹.

Information resources

It is clear that appropriate evidence-based information resources are required to complement pre-screening and screening activities, so that victims, perpetrators and practitioners have guidance on harm prevention, rehabilitation and recovery.

These resources would enable all parties to understand the causes and impacts of brain injury, and potentially take action to modify their circumstances and behaviour, as well as gaining awareness of potential symptoms and strategies for coping and recovery. For example, a positive recovery experience can promote resilience by helping victims to maintain employment and financial independence.

Engagement with adult perpetrators and victims of family violence, including providing them with additional information, should help identify children with potential for brain injury associated with family violence. The new referral systems for the pilot Support and Safety Hubs, along with new mandatory reporting requirements from January 2018, will bring children forward for screening and assessment for brain injury, as well as rehabilitation and recovery support. In addition, more information and training could be provided to schools.

Prevention through improved post-brain injury supports

Improved follow through is required for people with a pre-existing brain injury following discharge from medical care or rehabilitation, recognising they are at greater risk of either perpetrating or being subject to family violence (see Appendix B).

For those at risk of becoming victims of family violence because of their disability, increased communication and oversight is required regarding their welfare. For example, National Disability Insurance Scheme planning and funded supports, and the activities of State Trustees, could include a family violence awareness and response approach.

Linkages to mainstream services within the community for people with a brain injury need to be strengthened, and these services need to be adequate and adequately funded to provide follow-through support for people with a brain injury at whatever point post injury they are identified.

Integrated brain injury and family violence specialist supports

Services, such as the existing successful Court Support and Diversion Services, should be extended to cover more points in the justice system, police referrals and other entry points (Men's Referral Service). By incorporating diagnosis, these services clarify the nature of the perpetrator's impairment and provide guidance on suitable approaches.

New services are required that build on this successful experience and apply it to the context of victims of family violence with a brain injury, most commonly adult women and children. These services are essential complements to activities of screening and information provision.

Many family violence service settings, such as the initiative of Support and Safety Hubs²⁰, provide, or are moving to, an integrated approach.

19 Refer the Royal Commission into Family Violence Recommendation 96: 'The Department of Health and Human Services require routine screening for family violence in all public antenatal settings. The screening guidance should be aligned with the revised Family Violence Risk Assessment and Risk Management Framework. Implementation will require targeted and continued training, the development of specific guidelines, and clinical support.'

20 Refer the Royal Commission into Family Violence Recommendation 37: 'The Victorian Government introduces Support and Safety Hubs in each of the state's 17 Department of Health and Human Services regions.'

The Royal Commission into Family Violence Recommendation 37 states that:

'These hubs should be accessible and safe locations that:

- receive police referrals (L17 forms) for victims and perpetrators, referrals from non-family violence services and self-referrals, including from family and friends
- provide a single, area-based entry point into local specialist family violence services, perpetrator programs and integrated family services, and link people to other support services
- perform risk and needs assessments, and safety planning using information provided by the recommended statewide Central Information Point
- provide prompt access to the local Risk Assessment and Management Panel
- provide direct assistance until the victim, perpetrator and any children are linked with services for longer-term support
- book victims into emergency accommodation and facilitate their placement in crisis accommodation
- provide secondary consultation services to universal or non-family violence services
- offer a basis for colocation of other services likely to be required by victims and any children.'

Risk of, and responses to, brain injury are tightly woven into the family context, especially in the presence of family violence. Tailored neuropsychology services, addressed to men, women and children, victims and perpetrators, and in an integrated way, can offer:

- assessment and diagnosis for clients screened and referred by family violence services
- guidance to clients regarding their diagnosis and its implications
- guidance to family violence practitioners on the specific needs of individual clients
- validation and continuous improvement of pre-screening, screening and diagnosis-informed supports
- referral and relationship-building with other brain injury services, such as specialist subacute care and concussion clinics
- relationship-building with education and school supports
- provision for ongoing access and support.

Conclusion

Brain injury exacerbates the avoidable costs of family violence, both for families and for the wider community. For family members, death, permanent disability or temporary disability result in lost opportunity for economic and social participation, independence and quality of life. Brain injury reduces the capacity of either victim or perpetrator to address their situation and to become more resilient to their circumstances.

For children, brain injury constrains their development of life skills and opportunities. For the community, the costs of policing, hospitalisation and rehabilitation, the increased need for supports, such as income, housing, education and parenting, and the lost productivity and increased disability are all higher when brain injury is associated with family violence.

This project has drawn together the available evidence on brain injury associated with family violence.

A number of questions remain including:

- What is the incidence of brain injury associated with family violence in the general community, including victims and perpetrators, men, women and children?
- What are the core information resources needed (plus content) to support practitioners and their clients in family violence settings?
- What information needs to be integrated into activities on family violence prevention and workforce training?
- What combination of pre-screening tools and referral, including detailed screening and diagnosis, is most appropriate in whole of family/family violence settings?
- What communication tools and approaches are most effective in promoting integrated approaches across and within client groups, among specialist neuropsychology supports, among family violence supports, and between neuropsychology and family violence practitioners?
- What are the available service design options and which are preferred for trial?

Answering these questions will generate benefits for perpetrators, victims (adult and children) and practitioners working in family violence settings, as shown in Figure 3.

Figure 3. Benefits to families and practitioners

Perpetrators	Adult and child victims	Practitioners
Self-management strategies More knowledgeable/skilled family/support network Response planning	Recover further, more quickly Better work/education prospects	Information resources for self and clients Validated screening approaches Dovetailed approach to referral and psychologist-informed family violence management
Lower avoidable cost More social connection/resilience Reduced further family violence exposure		

Recommendations

The consortium recommends that the Victorian Government:

- develops and distributes information resources on brain injury, aimed at both victims and perpetrators of family violence, as well as the integrated family violence system
- adds screening questions for brain injury to family violence risk assessments, including the Multi-Agency Risk Assessment and Management Framework (MARAM)
- pilots an integrated brain injury and family violence service to support diagnosis, rehabilitation and harm reduction, in conjunction with complementary government initiatives, such as the Support and Safety Hubs
- develops, and where they do not exist, maps, services and supports relevant to the profile of brain injury and family violence detailed in this report, for all people with a brain injury at increased risk of perpetrating or becoming a victim of family violence due to their disability, as well as people with a brain injury resulting from family violence.

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Glossary

CALD	Culturally and linguistically diverse
Cases	Used in this report to describe instances of hospital-provided care. Family violence-related cases are those instances where people are recorded as attending hospital for family violence-related reasons.
GCS	Glasgow Coma Scale
GP	General practitioner
Injury-VIBES	Validating and Improving Injury Burden Estimates Study
Hospital attendances	Used in this report to describe people attending hospital for care, including major trauma, hospital admissions and emergency department presentations.
Perpetration of family violence	Defined as 'behaviour that controls or dominates a family member and causes them to fear for their own or another person's safety or wellbeing' (Department of Human Services, 2012).
Practitioner	Used in this report to refer to the range of services involved in the integrated family violence system, including specialist family violence services, child and family services, perpetrator intervention services, and related health and justice sectors.
PTA	Post-traumatic amnesia
RESTORE	REcovery after Serious Trauma – Outcomes, Resource use and patient Experiences – a longitudinal study of major trauma patients with a date of injury from July 2011 to June 2012, exploring patient outcomes in the first five years after injury.
TBI	Traumatic brain injury
Victim	Victims of family violence are subject to perpetrator behaviour that 'extends beyond physical and sexual violence and often involves emotional or psychological abuse and economic abuse. It can involve overt or subtle exploitation of power imbalances and may consist of isolated incidents or patterns of abuse over a period of time. ...While anyone can be a victim or perpetrator of family violence, it is most likely to be committed by men against women, children and other vulnerable people' (Department of Human Services, 2012).
VAED	Victorian Admitted Episode Dataset – details each admitted patient episode for all Victorian public and private hospitals, including rehabilitation centres, extended care facilities and day procedure centres.
VEMD	Victorian Emergency Minimum Dataset – details presentations at 40 Victorian public hospitals with designated emergency departments.
VSTR	Victorian State Trauma Registry – collects and analyses patient information from 138 health services managing trauma patients across Victoria.

Appendix A. Royal Commission into Family Violence: Recommendations relevant to Recommendation 171

Group 1 – Procedures

- 1. Revised CRAF Dec 2017
- 4. RAMP for high risk cases
- 26. Child protection referrals
- 27. Child risk assessment
- 81. Criminal offences in context of FV deemed FV matters
- 101. Access to VIFM assessments
- 138. Systemic review of FV related deaths
- 174. VicPol collect additional data on disability

Group 2 – Perpetrators

- 85. Map roles and responsibilities of all agencies dealing with perpetrators
- 86. Review of perpetrator interventions and behaviour change programs
- 87. Improved or extended perpetrator services
- 170. Data on people with disabilities who perpetrate FV

Group 3 – Data

- 143. FV Index
- 194. Outcomes, priorities, performance targets
- 197. Better data collection systems
- 203. Evaluation
- 204. Data linkage
- 205. CSA to maintain FV database
- 219. Cost of FV
- 220. Emphasis on prevention, intervention and long-term recovery
- 223. Demand modelling or indicators for service planning, including mainstream services

Group 4 – Services

- 10. Information website for victims
- 37. Support and safety hubs
- 39. Services funding for recovery support for those entering hubs
- 123. Adolescent FV program
- 139. FV connections for CALD, seniors, ATSI, etc
- 145. ATSI
- 153. Seniors
- 178. Extend access to FV disability crisis response beyond definition of Disability Act
- 180. Appropriate online resources for male victims
- 182. Rural and regional service capacity
- 183. Female prisoner victim services
- 185. Appropriate post-release services for victims on release from prison
- 224. Service streamlining and sharing

Group 5 – FV workforce

- 3. Workforce development and training
- 29. Training child protection practitioners
- 173. Disability response training
- 208. Social worker FV training

Group 6 – Medical workforce

- 95. Whole of hospital FV response
- 96. Screening in ante-natal settings
- 100. Database of specialist FV services to assist GP referrals
- 102. Medical learning agenda in FV
- 103. Mandatory GP training in FV

Appendix B. Interventions to reduce the impact of brain injury associated with family violence

This appendix describes a range of potential interventions to reduce the impact of brain injury associated with family violence. The interventions have been developed with stakeholders.

We have identified three categories of brain injury associated with family violence, which are:

- a) people with a pre-existing brain injury who are more prone to perpetrate family violence because of their challenging behaviours and other stressors related to their injury
- b) people with a pre-existing brain injury who are more vulnerable to family violence because of their disability and loss of independence
- c) victims of family violence (adults and children) who are vulnerable to brain injury through physical abuse, including strangulation and repeated abuse.

Each category presents specific opportunities for early action. Existing and potential interventions are discussed below for each category.

a) People with a pre-existing brain injury who are more prone to perpetrate family violence because of their challenging behaviours and other stressors related to their injury

What we know

There is evidence that effective support can help people with a brain injury and their families and carers to adapt to and manage challenging behaviours. Existing services, such as those offered by Diverge Consulting (Diverge Consulting, 2018), have demonstrated success in helping people with a brain injury and others in their support networks, to develop skills and strategies to reduce the frequency and severity of challenging behaviours, and to keep themselves safe.

Current research - funded by Victoria's Transport Accident Commission, and led by Professor Jennie Ponsford of Monash University, Professor Malcolm Hopwood of the University of Melbourne and Dr Tim Feeney from Belvedere Health Services in New York State - includes the world's first randomised controlled trial of Positive Behaviour Support for a group of adults with traumatic brain injury and challenging behaviours.²¹

Later stage interventions, such as those developed by the Court Support and Diversion Service (Magistrates' Court of Victoria, 2018), have demonstrated a positive benefit-cost ratio by reducing rates of reoffending for people with cognitive impairment. These interventions have focused on people who have been involved with the justice system for an average of 14 years, and yet they are achieving some success.

Around 25 per cent of Court Support and Diversion Service participants have an identified connection to family violence. The service employs dedicated, tailored supports (addressing factors such as brain injury, drug and alcohol, and family violence) to work with participants over a three to twelve-month period. This period is used, where necessary, to connect participants to longer-term supports available in the community.

Practitioners in men's behaviour change programs report that their current programs require higher-order cognitive skills. Suitably tailored programs and related specialised skills and knowledge are not currently available to meet the specific needs of participants with a brain injury. As a result, participants with a brain injury may be screened out from attending these programs.

There is a particular concern that perpetrators may seek to use brain injury as an excuse for their family violence, and that suitable approaches should be built on a clear diagnosis, coupled with maintaining individual responsibility for violent behaviour. Evidence from brain injury-focused support services demonstrates that a) under skilled assessment, brain injury cannot be 'faked', and b) tailored services, including group work, can be beneficial.

21 Brain Injury Australia serves as the Consumer Representative on the Steering Committee for this research

Where the gaps are

There are numerous gaps and missed opportunities in the existing systems.

First, follow through and support for people who sustain a brain injury, and their families and carers, is sporadic and inconsistent. Ongoing support often depends on how the injury was sustained. For example, some people are eligible for transport or work-related injury compensation schemes. Challenging behaviours are not always predictable and can take time to emerge. Left unchecked, they often worsen with time.

Second, beyond the immediate follow-through supports, there are very few opportunities to identify and intervene with brain injury-related challenging behaviours. As well as people who have not received adequate support following their injury, some people have never been diagnosed with a brain injury and they may not know about it, let alone its possible consequences for their behaviour.

The Court Support and Diversion Service is an example of an intervention opportunity, but it is limited to people who have a long record within the criminal system. Other opportunities for intervention in the justice system, such as intervention order processes in the civil system, are yet to be pursued.

Third, there are no processes in place to identify and provide appropriate responses to perpetrators with a brain injury who may emerge through police referrals (L17), or other referrals such as child safety and protection. Rather, these people may be screened as unsuitable for available services.

Fourth, the mainstream community support for people with a brain injury is experiencing significant financial uncertainty with the shift to the National Disability Insurance Scheme (NDIS). Reduced capacity in these services, coupled with uncertainty regarding NDIS eligibility, makes it difficult to obtain the supports that are needed, especially in the context of family violence.

Interventions

Existing successful interventions should be expanded by:

- improving follow through and access to supports for people with a brain injury and their families and carers, following discharge from medical care and rehabilitation
- extending services similar to the existing successful Court Diversion Service to more points in the justice system, police referrals and other entry points (Men's Referral Service). By incorporating diagnosis, these services clarify the nature of the perpetrator's impairment and provide guidance on suitable approaches
- ensuring mainstream services within the community for people with a brain injury are adequate and adequately funded to provide follow-through support for people with a brain injury at whatever point they are identified.

b) People with a pre-existing brain injury who are more vulnerable to family violence because of their disability and loss of independence

What we know

The Royal Commission into Family Violence identified that people with a disability, including people with a brain injury, are more vulnerable to family violence. In this context, family violence can take all forms, such as where a young person with a brain injury is subjected to financial abuse by a parent.

Where the gaps are

Difficulties arise from the initial lack of follow through and supports post injury, and the possible complexities of guardianship arrangements and insurance.

Interventions

As in category a), there should be improved follow through and access to support for people with a brain injury and their families and carers, following discharge from medical care and rehabilitation.

Approaches should also increase communication and oversight regarding the welfare of people with a disability. For example, NDIS planning and funded support, and the activities of State Trustees, could include a family violence awareness and response approach.

c) Victims of family violence (adults and children) who are vulnerable to brain injury through physical abuse, including strangulation and repeated abuse

What we know

Physical abuse, such as striking, shaking and strangulation, can result in brain injury, including circumstances where victims sustain repeated mild injury. While some of these injuries may be severe enough to result in hospital admission, many remain undiagnosed and unaddressed. Victims who are unaware of their potential injuries and ongoing risks may not understand the importance of protecting themselves from further injury. They are also compromised in their ability to manage the impacts of their injury, such as their capacity to work.

Research shows that the rate and duration of persistent symptoms following mild TBI or concussion can be effectively reduced by a combination of appropriate information, support and self-management.

'Early diagnosis and management of mild traumatic brain injury (mTBI) improves patient outcomes and reduces the impact of persistent physical, behavioural/emotional and cognitive symptoms' (Marshall et al., 2015). 'We found some evidence that early educational information can reduce long-term complaints and that this early intervention need not be intensive' (Borg et al., 2004). 'The provision of an information booklet reduces anxiety and reporting of ongoing problems' (Ponsford et al., 2002).

Persistent symptoms were reduced in a randomised controlled trial where subjects 'received a printed manual and met with a therapist prior to hospital discharge to review the nature and incidence of expected symptoms, the cognitive-behavioral model of symptom maintenance and treatment, techniques for reducing symptoms, and instructions for gradual resumption of premorbid activities' (Mittenberg et al., 1996).

A Canadian program on youth recovery from concussion is based on a synthesis of best evidence and expert opinion. Information delivered in a 90-minute interactive session with ongoing web-based peer support has resulted in 'strong positive self-reported changes in knowledge' (Hunt et al., 2016).

Specialist brain injury clinics have been established at Epworth, Monash and Caulfield hospitals. These offer an integrated set of specialist brain injury services, including neurologists, neuropsychologists, clinical psychologists, physiotherapists, speech pathologists and occupational therapists. People with a brain injury who have gained access to these services, and also to knowledgeable and supportive GPs, often report positive recovery experiences.

More recently, specific clinics have started to be established that address people experiencing longer-duration symptoms following a concussion. However, these services are not easy to find and access. Discussions are underway on the establishment of a concussion clinic for children at the Royal Children's Hospital.

Regional coordination services have been available for those victims of family violence who use alcohol or drugs, resulting in or exacerbating brain injury. For example, acquired brain injury training and development coordinators were attached to regional health services with a focus on drug and alcohol participants. However, it is understood that all but one of these positions has been defunded.

There are also proposals to provide family violence coordinators located in drug and alcohol services regionally. These regional coordination initiatives should be considered for supplementation with other brain injury interventions or pathways.

Where the gaps are

A recent National Disability Insurance Agency funded survey and interviews with Brain Injury Australia's constituents has confirmed that people who experience symptoms from a mild TBI or concussion over an extended duration (longer than three months) have difficulty in obtaining the information, support and guidance they need for optimal recovery.

Reported gaps include:

- poor recognition of brain injury in ambulance, hospital and GP settings
- lack of information at the time of injury regarding self-care and follow-up treatment
- inadequate GP support for people with a brain injury to assist with assessment and diagnosis, referral for specialist support and other practical support, such as medical certificates and emotional support
- difficulty gaining access to specialist brain injury clinics and services, and lack of availability of these services.

These common barriers to support and guidance in recovery result in much-extended periods of symptoms, emotional difficulties such as anxiety, frustration and fear, and suboptimal outcomes in the areas of work, financial support and relationships. Unfortunately, the barriers experienced extend across all categories of age and socioeconomic status, including in infants and children (Knox et al., 2017).

The combination of low GP awareness of problems following concussion or mild TBI, lack of suitable information resources, unclear referral pathways, and inadequate treatment and support services, makes seeking assistance for recovery a fraught and often tortuous exercise. This is the case even without the additional barriers pertaining to family violence cases, as discussed in the Needs analysis chapter and Annex C.

Interventions

Information resources for family violence practitioners, victims and perpetrators would enable parties to understand the causes and impacts of brain injury, and potentially take action to modify their circumstances and behaviour, as well as gaining awareness of potential symptoms and strategies for coping and recovery.

If we can better identify people who have sustained a brain injury, then we can ensure they have the information, guidance and support they need to stay safe and recover. A positive recovery experience will promote resilience by helping victims to maintain employment and financial independence, for example.

Engagement with adult perpetrators and victims of family violence, including providing them with adequate information, should help identify children with potential brain injury associated with family violence. The new referral systems for the pilot Support and Safety Hubs, along with new mandatory reporting requirements from January 2018, will bring children forward for screening and assessment for brain injury, as well as rehabilitation and recovery support. We will also consider incorporating more information and training for schools.

Given the current paucity of appropriate information, guidance and support for people who are experiencing mild TBI or concussion, and the more complex needs of people who are also experiencing family violence, there is no existing referral pathway suited to this group. HealthPathways Melbourne does not include a brain injury pathway and the current GP guidelines for family violence (The Royal Australian College of General Practitioners, 2014) do not include extensive brain injury information.

Eventually, these pathways should become established, but this may take several years. Brain Injury Australia is advocating strongly for improved follow through and supports for people with a brain injury. A proposal is under consideration with the National Disability Insurance Agency for web-based resources to support patients, their families and carers, and their GPs, in self-management and appropriate specialist referral during recovery.

Over time, better information, supports, services and pathways for brain injury should be established. In the interim, preparatory work should be undertaken to establish:

- better estimates of the numbers of victims and perpetrators of family violence who have an associated brain injury, with a focus on the unknown number living with disability as a result of multiple mild injuries and who, the limited international evidence suggests, are unaware of the potential effects of chronic injury and rarely seek medical attention
- how brain injury rehabilitation and recovery, alongside prevention of further injury, can best be facilitated in conjunction with other family violence support.

This work would enable design of long-term referral pathways to complement the family violence initiatives developed following the Royal Commission report.

Slater+Gordon
Lawyers

Premier Partner of Brain Injury Australia

Hospitalisation for head injury due to assault among Indigenous and non-Indigenous Australians, July 1999 – June 2005

Lisa M Jamieson, James E Harrison and Jesia G Berry

Head injury is a leading cause of disability globally, with survivors often suffering cognitive, mood and behavioural disorders.¹ Serious head injury may have long-lasting impacts on social and emotional development, and in employment.^{2,3} Quality of life following severe head injury can be markedly reduced,^{4,5} and behavioural sequelae frequently fail to resolve over time.⁶ The societal cost of disability following head injury is consequently substantial: services may need to be provided for life,⁷ and the personal and family burden is sometimes heavy.

Injury rates among the Indigenous Australian population are generally higher than those among other Australians. For example, in 1999–2000, the rate of hospitalisation for injury was about twice as high among those identifying as Indigenous as among non-Indigenous Australians.⁸ Assault was the most frequent cause of hospitalisation due to injury among Indigenous Australians between 2000 and 2002, but it ranked fourth among non-Indigenous Australians.⁹ Assault was responsible for about 44% of injury hospitalisations among Indigenous women, compared with only 2.3% among non-Indigenous women.

There has been little documentation of head injury rates among Indigenous Australians, particularly those resulting from assault. Estimating the magnitude of this problem will allow the burden of head injuries due to assault to be compared with other preventable health problems. This comparison can then provide a basis for deciding an appropriate level of investment in prevention.¹⁰ Here, we describe rates of head injury due to assault among Indigenous and non-Indigenous Australians by age, sex and location of residence.

METHODS

Hospital separation data on patients with head injuries due to assault who received inpatient care at public and private hospitals in Queensland, Western Australia, South Australia and the Northern Territory between 1 July 1999 and 30 June 2005 were obtained from the Australian Institute of Health and Welfare's National Hospital Mor-

ABSTRACT

Objective: To describe rates of hospitalisation for head injury due to assault among Indigenous and non-Indigenous Australians.

Design, setting and participants: Secondary analysis of routinely collected hospital morbidity data for 42 874 inpatients at public and private hospitals in Queensland, Western Australia, South Australia and the Northern Territory for the 6-year period 1 July 1999 – 30 June 2005.

Main outcome measures: Rates per 100 000 population of head injury due to assault by Indigenous status, age, sex and location of residence.

Results: The overall rate of head injury due to assault was 60.4 per 100 000 population (95% CI, 59.8–60.9). The rate among the Indigenous population was 854.8 per 100 000 (95% CI, 841.0–868.9), 21 times that among the non-Indigenous population (40.7 per 100 000; 95% CI, 40.2–41.2). Most Indigenous (88%) and non-Indigenous (83%) victims of head injury due to assault were aged between 15 and 44 years. The peak incidence among the Indigenous population was in the 30–34-year age group, whereas that among the non-Indigenous population was in the 20–24-year age group. Indigenous females experienced 69 times the injury rate experienced by non-Indigenous females.

Conclusions: Indigenous people, particularly women, were disproportionately represented among those hospitalised for head injury due to assault. Head injury imposes a substantial burden of care on individuals and communities. Along with the costs of treating head injury, these are good reasons to strengthen efforts to prevent head injury generally, with special attention to high-risk population segments.

MJA 2008; 188: 576–579

bidity Database. The scope of the study was restricted to these four jurisdictions because assignment of “Indigenous status” has been assessed as being too incomplete elsewhere.¹¹

Data were coded according to the International classification of diseases, 10th revision, Australian modification (ICD-10-AM). Records were selected if the principal or any additional diagnosis fields contained an ICD-10-AM code for *Injury to the head* (S00–S09). Sites of injuries include the skull and brain, ear, eye, face, gum, jaw, oral cavity, palate, periocular area, scalp, temporo-mandibular joint area, tongue and tooth. The codes do not include burns to the head. Traumatic brain injury, as defined by the Centers for Disease Control and Prevention's case definition,¹² included open wound of head, fracture of skull or facial bones, intracranial injury, crushing injury of head and other unspecified head injuries. About half of selected cases included more than one code in this range, mostly referring to different aspects of the same head injury (for example, principal diagnosis S06.4 *Epidural*

haemorrhage, plus additional diagnosis codes S02.0 *Fracture of vault of skull* and S06.02 *Loss of consciousness for less than 1 hour*). Head injuries were defined as being due to assault if they were described by one or more external cause codes of X85–Y09 (*Assault*), Y35–36 (*Legal intervention and operations of war*), Y87.1, Y89.0 and Y89.1 (sequelae, or late effects of these). To reduce double-counting, separations were excluded if the mode of admission was inward transfer from another acute care hospital.

Demographic information available from the hospital records included age, sex, Indigenous status and residential location. “Indigenous status” was defined as an individual who identified as being Aboriginal, Torres Strait Islander or both. Patients with Indigenous status “not stated” were included as “non-Indigenous” as per recommended practice.¹¹ Residential location was grouped using the Rural, Remote and Metropolitan Areas classification,¹³ an index based on statistical local areas that allocates each such area in Australia to a category based primarily on population numbers and an index of

1 Rates of head injury due to assault and incidence rate ratios among Indigenous and non-Indigenous Australians in four jurisdictions,* July 1999 – June 2005

Variable	Indigenous (I)				Non-Indigenous (NI)				Rate ratio (I:NI)
	No.	Rate per 100 000 (95% CI)	Unadjusted rate ratio (95% CI)	Adjusted rate ratio† (95% CI)	No.	Rate per 100 000 (95% CI)	Unadjusted rate ratio (95% CI)	Adjusted rate ratio† (95% CI)	
Total	14 715	854.8 (841.0–868.9)	na	na	28 159	40.7 (40.2–41.2)	na	na	21.0
Age group (years)									
0–4‡	137	61.3 (51.7–72.7)	1.0	1.0	290	6.6 (5.9–7.4)	1.0	1.0	9.3
5–9	48	20.8 (15.6–27.8)	0.3 (0.2–0.5)	0.3 (0.2–0.5)	67	1.4 (1.1–1.8)	0.2 (0.2–0.3)	0.2 (0.2–0.3)	14.9
10–14	158	75.3 (64.3–88.1)	1.2 (1.0–1.5)	1.2 (1.0–1.5)	474	10.1 (9.3–11.1)	1.5 (1.3–1.8)	1.5 (1.3–1.8)	7.5
15–19	1476	852.4 (809.7–897.3)	13.9 (11.6–16.6)	13.9 (11.6–16.6)	4560	96.7 (93.9–99.6)	14.6 (13.0–16.5)	15.4 (13.6–17.3)	8.8
20–24	2383	1695.9 (1628.6–1765.9)	27.7 (23.2–32.9)	26.8 (22.5–31.9)	5601	117.8 (114.7–121.0)	17.8 (15.8–20.1)	19.8 (17.6–22.3)	14.4
25–29	2720	2006.1 (1931.3–2083.8)	32.7 (27.5–38.9)	31.6 (26.6–37.7)	4369	87.3 (84.8–90.0)	13.2 (11.7–14.9)	14.3 (12.7–16.1)	23.0
30–34	2782	2140.4 (2061.4–2222.5)	34.9 (29.3–41.5)	33.7 (28.3–40.1)	3571	67.7 (65.5–70.0)	10.2 (9.1–11.5)	10.9 (9.6–12.3)	31.6
35–39	2145	1884.3 (1805.1–1966.9)	30.7 (25.8–36.6)	29.5 (24.8–35.2)	3065	57.8 (55.8–59.9)	8.7 (7.8–9.9)	9.0 (8.0–10.2)	32.6
40–44	1422	1495.5 (1419.3–1575.9)	24.4 (20.4–29.1)	23.8 (19.9–28.5)	2281	45.8 (43.9–47.7)	6.9 (6.1–7.8)	6.6 (5.9–7.5)	32.7
45–49	762	1003.5 (933.8–1078.4)	16.4 (13.6–19.7)	16.0 (13.3–19.2)	503	30.5 (29.0–32.1)	4.6 (4.1–5.2)	4.7 (4.1–5.3)	32.9
50–54	384	663.2 (599.6–733.7)	10.8 (8.9–13.2)	10.5 (8.6–12.7)	989	21.4 (20.1–22.8)	3.2 (2.8–3.7)	3.3 (2.9–3.7)	31.0
55–59	128	317.5 (266.4–378.3)	5.2 (4.1–6.6)	4.9 (3.9–6.3)	615	16.2 (15.0–17.6)	2.5 (2.1–2.8)	2.4 (2.1–2.8)	19.6
60–64	96	340.3 (278.6–415.7)	5.6 (4.3–7.2)	5.1 (3.9–6.6)	317	10.5 (9.4–11.8)	1.6 (1.4–1.9)	1.6 (1.3–1.8)	32.4
65–69	30	144.0 (99.5–208.6)	2.3 (1.6–3.5)	2.1 (1.4–3.2)	143	5.6 (4.8–6.7)	0.9 (0.7–1.0)	0.9 (0.7–1.0)	25.7
≥ 70	44	71.3 (51.7–98.5)	1.2 (0.8–1.7)	1.0 (0.7–1.5)	314	5.0 (4.4–5.6)	0.8 (0.6–0.9)	0.9 (0.7–1.0)	14.3
Sex									
Male‡	6540	767.4 (748.8–786.4)	1.0	1.0	23 471	67.8 (67.0–68.7)	1.0	1.0	11.3
Female	8175	940.4 (920.0–961.2)	1.2 (1.2–1.3)	1.2 (1.2–1.2)	4688	13.6 (13.2–14.0)	0.2 (0.2–0.2)	0.2 (0.2–0.2)	69.1
Location									
Metropolitan‡	1816	214.8 (205.1–224.9)	1.0	1.0	14 259	23.9 (23.5–24.2)	1.0	1.0	9.0
Rural or remote	12 586	1499.7 (1473.7–1526.1)	7.0 (6.6–7.3)	6.9 (6.6–7.3)	13 399	163.2 (160.5–166.0)	6.8 (6.7–7.0)	7.2 (7.0–7.4)	9.2

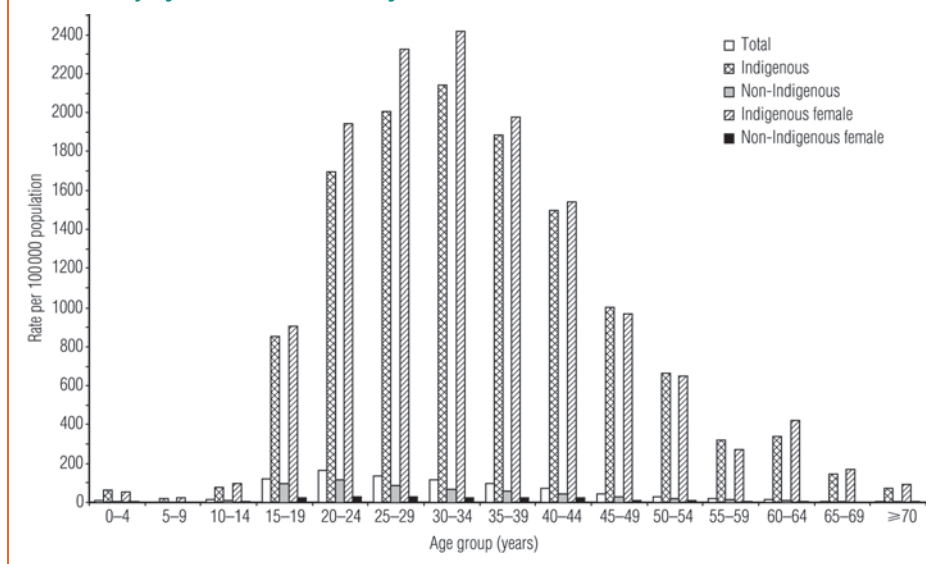
na = not applicable. * Queensland, Western Australia, South Australia and Northern Territory. † Generalised estimates of rate ratio by Poisson regression model are adjusted for all other covariates. ‡ Reference category.

remoteness. “Metropolitan” is defined as any capital city or other city with a population of >100 000; “rural” areas are those with a population ranging from 10 000 to 99 999; and “remote” areas are those with a population of <10 000. For the purposes of this study, rural and remote areas were combined.

Estimated resident population counts for all demographic strata (age, sex, Indigenous status, residential location) in the four jurisdictions as at 31 December in each year were obtained from the Australian Bureau of Statistics (ABS). Annual average rates of head injury incidence (estimated number of

new hospital admissions for head injury per annum in a specified stratum divided by the estimated resident population of the same stratum, multiplied by 100 000) and incident rate ratios were calculated along with 95% confidence intervals using a generalised Poisson regression model.¹⁴ Results

2 Head injury due to assault, July 1999 – June 2005



from the Poisson regression model are presented as unadjusted and adjusted incident rate ratios to estimate the independent effect of each covariate on the rate of head injury due to assault. Data were analysed using Intercooled Stata 8.0 software (StataCorp, College Station, Tex, USA).

RESULTS

There were a total of 42 874 patients hospitalised for head injury due to assault during the 6-year period 1 July 1999 to 30 June 2005 in the four Australian jurisdictions included in our study. Rates were markedly higher among the Indigenous population (Box 1). The rate of head injury due to assault among non-Indigenous people rose in early adulthood, peaked at ages 20–24 years and declined thereafter. On the other hand, the rate among Indigenous people rose in early adulthood, peaked at ages 30–34 years and remained elevated through middle age. Most Indigenous (88%) and non-Indigenous (83%) victims of head injury due to assault were aged between 15 and 44 years (Box 1, Box 2).

The rate of head injury due to assault in the total population was 60.4 per 100 000 (95% CI, 59.8–60.9). Among the Indigenous population it was 854.8 per 100 000, while among the non-Indigenous population it was 40.7 per 100 000, giving a rate ratio of 21.0 (Box 1). The Indigenous to non-Indigenous rate ratios ranged from 23 to 33 among the 25–29-year to 45–49-year age groups. The rate ratio was especially high among females: 69.1 at all ages and 93.3 at 30–34 years. Indigenous people

living in both metropolitan and rural/remote locations experienced nine times the rate experienced by non-Indigenous people.

Indigenous females experienced greater rates of head injury due to assault than Indigenous males, and the rate among Indigenous people living in rural/remote locations was seven times the rate among those living in cities. The rate among non-Indigenous females was around one-fifth that of non-Indigenous males; but, as in the Indigenous population, the rate among non-Indigenous people living in rural/remote locations was seven times the rate among those living in cities.

DISCUSSION

Our findings indicate that the rate of hospitalisation for head injury due to assault among Indigenous Australians in four jurisdictions was 21 times that among non-Indigenous Australians in the 6-year period 1 July 1999 to 30 June 2005 after adjustment for differences in age, sex and residential location. Indigenous people had higher rates in every age group; the excess morbidity was greatest at 30–34 years, and the ratio of Indigenous to non-Indigenous rates was largest at 35–49 years. Indigenous females experienced 69 times the rate of head injury due to assault experienced by non-Indigenous females. The excess of head injury due to assault among the Indigenous population has an age distribution (15–49 years) similar to that of the excess of all causes of mortality in this population.¹⁵ That is, this condition has its greatest impact upon people upon whom

communities depend for parenting, income and other activities.

An earlier study of hospitalisations for injury among Indigenous people noted that, according to ABS census data, about two-fifths of Indigenous people live in New South Wales, Victoria, the Australian Capital Territory and Tasmania, the four jurisdictions for which “Indigenous status” enumeration is considered to be of insufficient quality to warrant reporting.⁹ In their study period (1 July 2000 to 30 June 2002), almost a quarter of all external cause separations recorded for Indigenous people involved residents of these jurisdictions. While the excluded jurisdictions represent a sizeable proportion of the Indigenous population of Australia, their inclusion would reduce the reliability of our findings, and we do not think it advisable to generalise our findings to them.

The finding that Indigenous people had much higher rates of head injury due to assault than non-Indigenous people is consistent with reports in other developed countries with indigenous populations.¹⁶ The high rates in our study imply a substantial personal and social burden on injured people, their families and their communities, and a financial burden on already stretched health systems.¹⁷ However, the most serious cost is arguably the stressing and disruption of social bonds among Indigenous Australians as a result of such trauma.

It has been suggested that the rate and types of violence among Indigenous Australians are increasing, with much of the aggression being directed towards women.¹⁸ The “Little children are sacred” report states that the role of alcohol in violence among Indigenous communities cannot be emphasised enough, and suggests that aggression is greater in communities where alcohol is easily obtained.¹⁹ The complex social history of Indigenous Australians needs to be carefully considered if alcohol-related violence is to be comprehensively explained. It has been asserted that the inferior health status of Indigenous Australians is inextricably linked to their historical legacy, their ongoing social and economic disadvantage (including displacement from their homes, land and lifestyle) and psychosocial trauma (particularly in regard to child separation).²⁰

Non-urban place of residence was a risk factor for hospitalisation for head injury due to assault among both Indigenous and non-Indigenous Australians. Retrieval and transport of patients with head injury to designated trauma centres may be difficult for

those living in rural or remote locations.²¹ Although services to manage the consequences of assault are essential, primary prevention is at least as important.

Priority areas of action to reduce the prevalence of head injury due to assault among Indigenous Australians that are supported by the National Public Health Partnership²² include:

- collaborating with key agencies responsible for services and planning among Indigenous groups to ensure that prevention of head injury due to assault is integral to policy development;
- raising awareness of the challenges of program implementation among Indigenous populations, particularly when populations are small and dispersed; and
- supporting safety promotion and injury prevention policies that address a range of social, environmental and behavioural factors and provide good examples of dealing with the underlying alienation and disadvantage of Indigenous people.

The associated National Aboriginal and Torres Strait Islander Safety Promotion Strategy²³ takes a broad approach emphasising the diverse determinants of safety. However, before true parity between Indigenous and non-Indigenous victims of head injury due to assault is reached, fundamental shifts in the political and societal paradigms that determine Indigenous social capital may also be necessary.

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COMPETING INTERESTS

None identified.

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