

# Biennial report of the deaths of children in New South Wales: 2018 and 2019

Incorporating reviewable deaths of children

A report to Parliament under sections 34G and 43 of the  
*Community Services (Complaints, Reviews and Monitoring) Act 1993*.



24 AUGUST 2021

## Acknowledgements

We extend our appreciation to the NSW Government agencies that provided ongoing access to records for this report. They include the NSW Registry of Births, Deaths and Marriages, the Office of the NSW State Coroner, NSW Health, the Department of Communities and Justice, the Department of Education, and the NSW Police Force.

Many other government and non-government agencies also provided records and other information to assist our work and reviews, including agencies and child death review committees in other states and territories, and we thank them for their timely and helpful input. We also appreciate the assistance of staff from the Australian Bureau of Statistics for their quality assurance and support in relation to coding.

We also thank all CDRT members and expert advisers for their contributions, expert advice and support.

Finally, we thank the Ombudsman staff who manage the day-to-day work of our death review functions.

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24 August 2021

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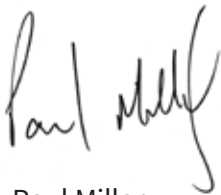
Dear Mr President and Mr Speaker,

As Convenor of the NSW Child Death Review Team, I am pleased to present the Biennial report of the deaths of children in New South Wales: 2018 and 2019, incorporating reviewable deaths of children.

This report is presented in accordance with section 34G and section 43 of the *Community Services (Complaints, Reviews and Monitoring) Act 1993* (the Act). It concerns the deaths of 989 children who died in in NSW 2018 and 2019, including 38 children who died while in care (19), or in circumstances of (or suspicious of) abuse or neglect (19).

I recommend that this report be made public immediately.

Yours sincerely



Paul Miller

**NSW Ombudsman**  
**Convenor, NSW Child Death Review Team**

## Foreword

A core tenet of the NSW Child Death Review Team (CDRT) is that we can, and indeed have a responsibility to, learn from the deaths of children and to use that knowledge to prevent and reduce the risk of deaths in the future.

This report concerns the 989 children who died in New South Wales in calendar years 2018 and 2019. The report also includes information about longer term trends in child mortality in this state.

This is the second biennial report to combine the work of the CDRT (which the NSW Ombudsman convenes) with the Ombudsman's separate responsibility for 'reviewable' deaths of children. A child's death is 'reviewable' if it occurred in circumstances of, or suspicious of, abuse or neglect, or where the child had been living in care.

It is pleasing to be able to report that infant and child mortality rates in NSW are overall, continuing to decline in NSW. Over the 15-year period from 2005 to 2019, the infant (aged less than 1) mortality rate declined by 30%; and for children aged 1 to 17 years, the rate declined by 26%.

However, there remains much more to be done to prevent child deaths in NSW.

The report again highlights that declines in mortality are not uniform. There are clear variations in the risk of child deaths in NSW by region and across different socioeconomic groups. Consistent with our previous reports, infants and children from disadvantaged families are over-represented in deaths from almost all causes, and the mortality rate for Aboriginal and Torres Strait Islander infants and children remains significantly higher than for non-Indigenous children.

While the general link between socioeconomic status and the risk of child death is well established, questions remain about the factors underpinning this relationship. The CDRT, through the Australian Institute of Health and Welfare, is currently undertaking research using data-linkage to improve our understanding of the relationship between antenatal care, birth conditions and socio-economic status on early childhood mortality. The project will model the effect of individual level characteristics of the child and the mother at the time of death and area-level socio-economic factors to better understand the underlying risk factors for early child mortality. This is an important step in working toward preventive strategies that will make a difference. Once complete, I expect to table the results of this research in 2022.

Also of particular concern is that, unlike other causes of death, the rate of suicide among children and young people aged 10 to 17 has significantly increased over the past 15 years, and in 2018 and 2019 suicide was the leading cause of death for young people aged 15 to 17 years.

This report has been prepared during a time of great challenge associated with the global COVID-19 pandemic, including for the work of the CDRT. Many of the members of the CDRT work on the front lines of health and service provision for children and their families, and I thank the Team for its support in the preparation of this report.

On behalf of the Team and staff, I wish to convey my sincere condolences to the families and friends of the infants, children and young people who have died, and whose deaths are considered in this report.

It is our foremost responsibility that, in reviewing these deaths, we learn from them and use that knowledge to make a difference.



Paul Miller

**NSW Ombudsman**  
**Convenor, NSW Child Death Review Team**

**Vale Dr Ferry Grunseit (1922-2021)**

Ferry Grunseit was a much-esteemed former colleague and exceptional paediatrician who successfully advocated for the establishment of the NSW Child Death Review Committee in the early 1990's – which later became the NSW Child Death Review Team.

Ferry was appointed to the Ombudsman's Reviewable Child Deaths Advisory Committee upon its establishment in early 2003, until he retired from this role in September 2009.

Ferry's humanity, his insight into the issues facing families and agencies alike, his medical knowledge, and his understanding of child protection in NSW, were of enormous value to the Team. We are indebted to his vision and activism in preventing and reducing child deaths.

# Contents

<b>Executive summary</b> .....	<b>1</b>
A note on terminology .....	1
<b>Overview of key observations</b> .....	<b>1</b>
<b>1. Introduction</b> .....	<b>6</b>
1.1. The NSW Child Death Review Team .....	6
1.2. 'Reviewable' deaths of children .....	7
1.3. About this report .....	7
1.4. Key terms and definitions .....	7
1.5. Methods .....	9
1.6. Deaths of resident children living outside NSW .....	10
<b>2. Infant and child deaths: an overview</b> .....	<b>11</b>
2.1. Infant and child deaths in 2018-2019 .....	11
2.1.1. Infant deaths by demographics and cause of death .....	11
2.1.2. Child deaths by demographics and cause of death .....	12
2.1.3. Child protection history .....	13
2.2. Leading causes of death in 2018-2019 .....	14
2.3. Reviewable deaths in 2018-2019 .....	15
2.4. Trends in infant and child deaths, 2005-2019.....	16
2.4.1. Infant deaths by year, demographics, and cause.....	16
2.4.2. Child deaths by year, demographics, and cause.....	19
2.4.3. Trends in leading causes of deaths, 2005-2019 .....	21
2.4.4. Trends in reviewable deaths, 2010-2019 .....	23
2.5. Observations.....	24
2.5.1. Infant and child mortality rates in NSW are declining overall .....	24
2.5.2. Some infants and children have higher mortality rates than others.....	24
2.5.3. Cause of death trends differ for infants and children.....	24
<b>3. Natural causes</b> .....	<b>25</b>
3.1. Natural cause infant and child deaths in 2018-2019 .....	25
3.1.1. Natural cause deaths among infants by demographics.....	25
3.1.2. Natural cause deaths among children by demographics .....	26
3.1.3. Leading causes of death among infants .....	26
3.1.4. Leading causes of death among children .....	27
3.2. Trends in natural cause infant and child deaths, 2005-2019 .....	27
3.2.1. Trends in natural cause deaths by year .....	28
3.2.2. Trends in natural causes of death by cause of death .....	28
3.3. Factors identified for natural cause infant and child deaths, 2018-2019 .....	29
3.3.1. Premature birth .....	29
3.3.2. Maternal factors and complications in pregnancy.....	30
3.3.3. Congenital and chromosomal abnormalities.....	30
3.3.4. Vaccine-preventable diseases .....	30
3.4. Infants and children in care, 2018-2019.....	32
3.5. Observations.....	32
3.5.1. Natural cause mortality rates are declining .....	32
3.5.2. Potentially preventable natural deaths among young children require further investigation	32
<b>4. Sudden Unexpected Death in Infancy</b> .....	<b>33</b>
4.1. SUDI overview .....	33
4.2. SUDI in 2018-2019, and trends .....	34
4.2.1. SUDI by demographics .....	34
4.2.2. SUDI by cause of death.....	35

4.3.	Factors associated with SUDI deaths, 2018-2019 .....	37
4.3.1.	Intrinsic factors .....	38
4.3.2.	Extrinsic factors.....	39
4.4.	Agency responses to SUDI.....	40
4.4.1.	Investigations of SUDI in 2018-2019 .....	42
4.4.2.	Child protection concerns.....	42
4.5.	Observations and recommendations .....	44
4.5.1.	SUDI mortality has not declined in the last five years in NSW.....	44
4.5.2.	Infants were frequently exposed to multiple risk factors that could have been avoided .....	44
4.5.3.	Disadvantaged families are over-represented in SUDI .....	44
4.5.4.	There has been little improvement in the number of SUDI medical histories completed .....	45
<b>5.</b>	<b>Injury: an overview.....</b>	<b>46</b>
5.1.	Injury fatalities in 2018-2019, and trends .....	46
5.1.1.	Injury-related deaths by demographics.....	47
5.2.	Injury-related deaths by cause .....	48
5.2.1.	Causes of injury-related deaths by age and gender .....	48
5.2.2.	Causes of injury-related deaths by Aboriginal and Torres Strait Islander status .....	49
5.2.3.	Causes of injury-related deaths by remoteness and socio-economic status .....	49
5.3.	Child protection history .....	49
5.4.	Observations.....	49
5.4.1.	Injury-related deaths are the ‘tip of the iceberg’ for childhood injury.....	49
5.4.2.	Injury-related child deaths are decreasing in NSW except for suicide.....	49
5.4.3.	Injury-related deaths are higher for certain groups of children .....	50
<b>6.</b>	<b>Transport .....</b>	<b>51</b>
6.1.	Transport fatalities in 2018-2019, and trends .....	51
6.1.1.	Transport fatalities by demographics .....	52
6.1.2.	Transport fatalities by nature of incident .....	53
6.1.3.	Transport fatalities by ‘fault’ .....	54
6.2.	Factors identified in transport-related deaths, 2018-2019 .....	54
6.2.1.	Speeding.....	55
6.2.2.	Reckless driving.....	55
6.2.3.	Driving under the influence of alcohol and drugs.....	55
6.2.4.	Age and inexperience.....	55
6.2.5.	Restraints and protective equipment .....	56
6.2.6.	Environmental factors and visibility .....	57
6.2.7.	Driver distraction.....	57
6.2.8.	Vehicle safety .....	57
6.2.9.	Supervision.....	60
6.3.	Observations and Recommendations.....	60
6.3.1.	Unsafe driver behaviours remain the key contributing factor in transport crashes.....	61
6.3.2.	More than half the at-fault drivers were novice drivers .....	61
6.3.3.	Seatbelts and child restraints can prevent deaths of children in vehicle crashes.....	61
6.3.4.	Quad bikes are inherently dangerous for children.....	62
6.3.5.	The majority of deaths involved older, less safe vehicles .....	63
<b>7.</b>	<b>Drowning.....</b>	<b>65</b>
7.1.	Drowning in 2018-2019, and trends .....	65
7.1.1.	Drowning deaths by demographics.....	65
7.1.2.	Location of drowning by age of children .....	66
7.2.	Factors identified for drowning-related deaths, 2018-2019 .....	67
7.2.1.	Swimming pools .....	68
7.2.2.	Bathtub drowning .....	68
7.2.3.	Dams and other inland waterways .....	69
7.3.	Observations and Recommendations.....	69
7.3.1.	Compliance with child safety barrier fencing requirements is essential.....	70

<b>8. Other unintentional injury .....</b>	<b>71</b>
8.1. Other unintentional injury-related deaths in 2018-2019, and trends .....	71
8.1.1. Other unintentional injury-related deaths by cause of death .....	71
8.2. Factors identified in unintentional injury-related deaths, 2018-2019 .....	72
8.2.1. Lack of active supervision .....	72
8.2.2. Risk-taking .....	72
<b>9. Suicide .....</b>	<b>73</b>
9.1. Suicide deaths among young people in 2018-2019, and trends.....	73
9.1.1. Suicide among young people by demographics.....	74
9.1.2. Suicide among young people by child protection history .....	74
9.2. Factors identified for suicide among young people, 2018-2019 .....	75
9.2.1. Individual risk factors .....	75
9.2.2. Family factors .....	76
9.2.3. School, employment, and peer-related factors.....	76
9.3. Was suicide risk identified? .....	77
9.3.1. Multiple factors and high risk .....	77
9.3.2. Some factors and moderate risk.....	78
9.3.3. Few factors and low risk.....	79
9.4. Young people in care .....	79
9.5. Observations and Recommendations.....	81
9.5.1. The rate of suicide among young people in NSW is increasing.....	81
9.5.2. A coordinated approach to responding to risk is critical .....	81
9.5.3. Timely access to appropriate services and strategies to address emerging mental health concerns continues to be crucial to the delivery of services and support .....	82
9.5.4. Young people in care remain vulnerable to suicide.....	83
<b>10. Abuse and neglect .....</b>	<b>84</b>
10.1. Abuse and neglect overview .....	84
10.2. Abuse and neglect-related deaths in 2018-2019, and trends .....	84
10.2.1. Abuse and neglect-related deaths by demographics .....	85
10.2.2. Abuse and neglect-related deaths by child protection history.....	85
10.2.3. Charges and convictions.....	85
10.3. Circumstances of abuse and neglect-related deaths .....	86
10.3.1. Persons causing harm.....	87
10.4. Factors identified for abuse and neglect deaths, 2018-2019.....	87
10.4.1. Family violence and relationship factors .....	87
10.4.2. Parental mental illness .....	89
10.4.3. Alcohol and other drug use.....	90
10.5. Child protection risk and response .....	92
10.5.1. Communities and Justice .....	92
10.5.2. NSW Health .....	95
10.5.3. Child protection as a shared responsibility .....	96
10.6. Observations and Recommendations.....	98
10.6.1. Case coordination, collaboration and information sharing remains an area of concern .....	99
10.6.2. Premature closure of high-risk cases .....	99
10.6.3. Methadone deaths require close monitoring .....	100
<b>Appendices.....</b>	<b>101</b>
Appendix 1: NSW Child Death Review Team .....	102
Appendix 2: Monitoring previous recommendations.....	104
Appendix 3: Methods.....	107
Appendix 4: SUDI classifications .....	114
Appendix 5: Leading causes of death.....	119
Appendix 6: Supplementary data.....	126



# Executive summary

This report concerns the deaths of 989 children who died in New South Wales (NSW) in 2018 and 2019. It also provides information about trends in child mortality over time.

The report examines the underlying risk factors that may have contributed to preventable deaths, and seeks to identify actions that can and should be done to prevent or reduce the deaths of children in NSW in the future.

This report brings together the observations, findings, and recommendations arising from our statutory child death review responsibilities under the *Community Services (Complaints, Reviews and Monitoring) Act 1993*. These include both,

- The work of the NSW Child Death Review Team (CDRT), which is responsible for registering, classifying, analysing, and reporting to the NSW Parliament on data and trends relating to all deaths of children in NSW. The CDRT's purpose is to eliminate preventable deaths in NSW by working collaboratively to drive systemic change based on evidence.
- Reviews by the NSW Ombudsman's office of the deaths of children in care or detention, and children who died as a result of abuse or neglect or that occurred in suspicious circumstances. Reviews focus on factors that may have contributed to the child's death, agency responses to identified risk, and systemic issues related to prevention.

Thirty-eight of the 989 deaths covered by this report were reviewable by the Ombudsman because the child died while in care (19) or in circumstances of (or suspicious of) abuse or neglect (19).

## A note on terminology

In this report, unless otherwise specified:

- 'child' includes any person under 18 years
- 'infant' refers to a child under the age of one year
- 'young person' refers to a child aged 15 years or older.

Where it is necessary to refer to children of other specific age groups (for example, children excluding infants) those age groups are separately identified (for example, by referring to them as 'children aged 1-17 years').

## Overview of key observations

Overall, infant and child mortality rates in NSW are declining, in both natural and injury-related causes.

During the 15-year period from 2005 to 2019, the mortality rate for infants declined by 30%, from 4.7 to 3.3 deaths per 1,000 live births. For children aged 1-17 years, the mortality rate declined by 26%, from 15.4 to 11.4 deaths per 100,000 children.

However, children who have higher mortality rates than others include:

- those living in the most disadvantaged areas of NSW
- those living in regional and remote areas
- Aboriginal and Torres Strait Islander infants and children, and
- families with a child protection history.

Unlike other causes of death, the rate of suicide among children aged 10 to 17 years in NSW has significantly increased over the past 15 years. In 2018 and 2019, suicide was the leading cause of death for young people aged 15 to 17 years.

## Infants (aged less than one)

- In 2018 and 2019, more than half (61%, 599) of all children who died in NSW were infants.
- Most infant deaths (86%, 517) were due to natural causes and occurred in the first 28 days of life (75%, 446).
- Other infant deaths were due to injury (1.5%, 9), were undetermined (4.3%, 26), or were still under investigation (7.8%, 47).
- Over the past 15 years, the overall Infant Mortality Rate declined by 30% in NSW.

## Children aged 1-17 years

- In 2018 and 2019, 39% (390) of all children who died in NSW were aged 1-17 years.
- Just over half (52%, 204) of these children died from natural causes. Other child deaths were due to injury (39%, 151), or were still under investigation.
- Young people aged 15-17 years had the highest mortality rate, followed by children aged 1-4 years.
- Over the past 15 years, the overall Mortality Rate among children (aged 1-17 years) declined by 26%.
- In contrast to this overall decline, the rate of suicide among children aged 10-17 years has increased by 47% over the period.

## Leading causes of death: 2015-2019

The leading cause of death over the past five years differed according to age:

- For infants: the leading cause of death was perinatal conditions.
- For children aged 1-4 years, 5-9 years, and 10-14 years: the leading cause of death was cancers and tumours.
- For young people: the leading cause of death was suicide.

## Deaths from natural causes

In 2018 and 2019, 721 children died from natural causes in NSW. Nearly three-quarters (72%, 517) were infants. The highest risk of infant mortality is among infants born prematurely, particularly those born at less than 24 weeks gestational age.

Natural cause mortality rates are declining. Over the 15-year period 2005-2019, there have been significant declines in natural cause deaths for both infants (mostly driven by a significant decrease in perinatal conditions) and other children in NSW.

## Sudden Unexpected Death in Infancy (SUDI)

In 2018 and 2019, 80 infant deaths were classified as SUDI.

Most infants who died suddenly and unexpectedly were less than three months of age. The majority of infants were exposed to at least one avoidable risk, including tobacco smoke and objects or bedding that posed a risk of suffocation in their sleep environment.

Infants from families known to child protection authorities, and those who lived in the most disadvantaged areas of NSW, were over-represented in SUDI. Targeted interventions by frontline agencies need to focus on disadvantaged and vulnerable families.

## Injury-related deaths overview

In 2018 and 2019, 160 children died from injury-related causes in NSW.

Injury-related deaths are decreasing in NSW, except for suicide.

Young people (aged 15-17) consistently had the highest injury-related mortality rate of any age group, with suicide and transport fatalities accounting for most deaths.

Deaths from injury-related causes also include poisoning, falls, fire, being struck by an object, and accidental threats to breathing.

## Transport

In 2018 and 2019, 54 children died in transport fatalities in NSW.

Males, young people (aged 15-17), those living in regional or remote areas of NSW, and those from the most disadvantaged areas, were more likely to die in a transport-related incident than other children.

Unsafe driver behaviours – such as speeding, alcohol and drug use, and reckless driving – remain the key contributing factor in transport fatalities, especially in combination with driver inexperience. In 2018 and 2019, more than half the ‘at-fault’ drivers were young novice drivers.

The majority of child deaths occurring in motor vehicle incidents involved older, less safe vehicles. Seatbelts and child restraints can prevent the deaths of children in vehicle crashes.

## Drowning

In 2018 and 2019, 12 children died by drowning in NSW.

Drowning remains the leading cause of unintentional injury-related death for children aged 1-4 years in NSW. Most drownings of children this age occurred in private swimming pools. These fatalities often result from a chain of events – a faulty pool gate left unsecured, a carer distracted with household chores or attending to other children, unclear delegation for supervision, and/or a child able to leave the house unseen. Compliance with child safety barrier fencing requirements is essential.

Constant and arms-length supervision of infants and very young children in bathtubs is also vital.

For older children, most drowning incidents occurred in natural bodies of water such as beaches, rivers, and lakes. Other factors come into play in these drowning fatalities, such as a lack of experience in assessing or paying heed to danger.

## Suicide

In 2018 and 2019, 51 children died by suicide in NSW.

Unlike other causes and circumstances of death, the rate of suicide in NSW is increasing. Aboriginal and Torres Strait Islander children have a much higher rate of suicide than non-Indigenous children. More males than females die by suicide, and this gender gap has increased in the last 5 years.

No single factor or combination of factors can predict suicide – there are a range of individual, family, school and peer factors, and other demographic factors that are associated with suicide risk. A sustained, coordinated approach to responding to risk, timely access to appropriate services, and strategies to address emerging mental health concerns are crucial to reducing the rate of suicide.

## Abuse and neglect

In 2018 and 2019, 19 children died in circumstances of (or suspicious of) abuse or neglect in NSW.

Most of the children who died were from families known to child protection authorities. Well-recognised child protection issues – including family violence and relationship breakdown, parental mental illness, and parental alcohol and drug abuse – were often present in families where children died in circumstances of abuse or neglect.

Children under 5 years are the most vulnerable to fatal abuse and neglect – they accounted for more than half of all abuse and neglect-related deaths in the 10-year period.

More still needs to be done by agencies to address practice and systems issues to ensure better protection of children and improved support of vulnerable families. Key issues include case coordination, collaboration and information sharing, and the premature closure of high-risk cases.

## Recommendations 2021

The following list includes all recommendations made in this report.

### Sudden Unexpected Death in Infancy

1. That NSW Health complete a detailed audit of compliance with the revised SUDI medical history protocol. The audit should include information and analysis about:
  - a. The number of infants presented to emergency departments following their sudden and unexpected death.
  - b. The number of medical history interviews conducted in response to these deaths.
  - c. An assessment of whether the intent of the policy directive has been met and is reflected in the information gathered.
  - d. Information about the position of the health professional who completed the interviews, the location of the health facility, and the timing of the interview in relation to the death incident.
  - e. Whether the information gathered in the interview was provided to Forensic Medicine, and the timeliness of this (within 24 hours of the infant's death).
  - f. Where SUDI medical history interviews are not conducted, whether relevant staff are aware of health's policy, and reasons why the interview was not completed.
  - g. Details about any strategies or outcomes arising from the audit.

NSW Health should provide an audit plan and timeframes to the CDRT by 17 December 2021.

### Transport

2. Transport for NSW (Centre for Road Safety) include in its proposed website to allow consumers to search vehicles within a price range and by safety rating, a page targeted at young drivers. The website should be promoted directly to young drivers through a focused campaign.

### Drowning

3. The Department of Customer Service, in its planned upgrade of the Swimming Pool Register, ensure its collection and reporting capability allows for public amalgamated reporting of compliance data relating to the key aspects of swimming pool regulation, including the reasons pools barriers fail inspections, and whether non-compliances were rectified by owners within reasonable timeframes.

### Suicide

4. The Department of Communities and Justice (DCJ) detail:
  - a. the current response pathway when a ROSH report relating to suicide risk or suicide-related behaviours is made for a child or young person in out-of-home care.
  - b. the current response pathway when a case manager or caseworker otherwise identifies suicide risk or suicide-related behaviours for a child or young person in out-of-home care.
  - c. current interventions that have been implemented to reduce suicide risk or suicide-related behaviours for children and young people in out-of-home care, including but not limited to gatekeeper training or other skills training for caseworkers and foster or kinship carers.
  - d. The current status of the Out-of-Home Care Health Pathway Program and available data from this program that relates to the identification of and response to suicide risk or suicidal-related behaviours.
  - e. Any screening tools in place to identify suicide risk or suicide-related behaviours for a child or young person in out-of-home care that are applied during routine placement or other annual reviews.

## Abuse and neglect

5. The Department of Communities and Justice:
  - a. Detail the actions it is taking at a strategic level to address the premature closure of ROSH reports due to competing priorities, including cases closed without comprehensive assessment or face-to-face contact, and where referrals are made (in place of an assessment).
  - b. Advise us of the findings and outcomes of its review of existing policy and practice mandates around case closure, as recommended by the Deputy State Coroner in June 2020, and actions it is taking to address these.
  - c. Detail the outcomes of its review of practice mandates and policies in relation to the triage, allocation of ROSH reports, and closure of ROSH reports, as described in the March 2021 coronial inquest into the death of Z.

Advice regarding each of these points should be provided to us by 17 December 2021.

6. The Department of Communities and Justice advise us about any actions it is taking to record the outcome of referrals made when ROSH reports are not prioritised for comprehensive assessment, as well as actions it is taking, if any, to introduce a prompt to review DCJ's response to ROSH reports where referrals are unable to be allocated by service providers.

7. NSW Health:

- a. Outline its current processes for ongoing auditing of prescriber compliance with the NSW Clinical Guidelines: Treatment of Opioid Dependence (2018), including how prescribers are applying guidance regarding safe prescribing of opioid treatment medications for clients with children in their care.
- b. Provide us with a copy of any review by the Centre for Alcohol and Other Drugs of prescriber practices in incidents where a child has presented to a hospital with methadone or buprenorphine poisoning in the period 2018-2020.
- c. Describe and outline any risk assessment guidance it provides to authorised prescribers, in addition to information included in the Guidelines, including any information provided for prescribers to consider a patients overall caring responsibilities (for example grandparents or others who may provide occasional care to children).
- d. Clarify whether the revised Opioid Treatment Accreditation Course includes a child protection component.

This information should be provided by 17 December 2021.

## Monitoring previous recommendations

In addition to the recommendations made above, we continue to monitor agency progress in implementing some of our earlier recommendations. The NSW Child Death Review Team Annual Report 2019-20 provides detailed information about the progress agencies reported to us in 2020 in relation to CDRT recommendations.<sup>1</sup> This report can be accessed here:

<https://www.ombo.nsw.gov.au/news-and-publications/publications/annual-reports/nsw-child-death-review/nsw-child-death-review-team-annual-report-2019-20>.

Information about the extent to which recommendations made by the NSW Ombudsman in relation to reviewable child deaths have been implemented is also included in this report. Currently we are monitoring two Ombudsman recommendations.

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1. NSW Child Death Review Team 2020. NSW Child Death Review Team Annual Report 2019-20. NSW Ombudsman, Sydney.

# 1. Introduction

This report brings together observations, findings and recommendations arising from two statutory functions under the *Community Services (Complaints, Reviews and Monitoring) Act 1993 (CS CRAMA)*. It includes:

- Analysis of the deaths of all children in NSW for the NSW Child Death Review Team – under Part 5A of CS CRAMA.
- Reviews by the Ombudsman’s office of the deaths of children who die in circumstances of abuse or neglect, and children in care or detention – under Part 6 of CS CRAMA.

The combined reporting of these two functions provides for a holistic and contextual approach to the analysis and consideration of trends and issues.

## 1.1. The NSW Child Death Review Team

The purpose of the NSW Child Death Review Team (CDRT) is to prevent or reduce the likelihood of deaths of children in NSW. The CDRT consists of experts in healthcare, child development, child protection and research, as well as representatives of key government agencies (see Appendix 1). The main functions of the CDRT are to:

- maintain a register of child deaths occurring in NSW
- classify those deaths according to cause, demographic criteria and other relevant factors, and to identify trends and patterns relating to those deaths
- undertake, alone or with others, research that aims to help prevent or reduce the likelihood of child deaths and to identify areas requiring further research, and
- make recommendations that may assist in preventing or reducing the likelihood of child deaths.

The Ombudsman is the CDRT’s Convenor, and Ombudsman staff provide support and assistance to the Team, including maintaining, and analysing information contained in, the Child Death Register.

The CDRT reports directly to the NSW Parliament. There are three provisions in CS CRAMA under which the CDRT is required to report to Parliament:

- The annual report (s 34F), which details the activities of the CDRT and progress of its recommendations.
- The biennial child death review report (s 34G), which consists of data collected and analysed in relation to child deaths. Until 2016, this report was prepared and tabled on an annual basis. The first biennial report – which covered deaths of children that occurred in 2016 and 2017 – was tabled in Parliament in June 2019. This is the biennial child death review report for deaths in 2018 and 2019.
- Other reports (s 34H), which provide information on the results of research undertaken in the exercise of our research functions. The CDRT may report to Parliament at any time and is expected to report on its research at least once every three years.

All CDRT reports (annual, biennial, and research) are available on the NSW Ombudsman website: <https://www.ombo.nsw.gov.au/news-and-publications/publications>.

## 1.2. ‘Reviewable’ deaths of children

The Ombudsman has a separate responsibility for reviewing the deaths of children in circumstances of abuse or neglect, and the deaths of children in care or detention. On average over the 15 years to 2019, there have been 25 reviewable deaths of children each year. Under Part 6 of CS CRAMA, the Ombudsman’s functions are to:

- maintain a register of reviewable deaths
- monitor and review reviewable deaths
- undertake, alone or with others, research that aims to help prevent or reduce, or remove factors associated with, reviewable deaths that are preventable
- make recommendations as to policies and practices for implementation by government and non-government service providers to prevent or reduce the likelihood of reviewable child deaths.

Section 43(1) and (2) of CS CRAMA requires the Ombudsman to report to the NSW Parliament on a biennial basis about data collected and information relating to reviewable deaths, any recommendations made and the implementation or otherwise of previous recommendations. This report is the Ombudsman’s biennial report for reviewable child deaths in 2018 and 2019.

## 1.3. About this report

Since 2019, the CDRT biennial report and the Ombudsman’s biennial report of reviewable child deaths are combined into one report. Combined reporting allows us to present an integrated report that examines all child deaths in NSW, and the contexts in which the deaths occur, in a way that focuses on factors and whole of population measures for prevention.

This report concerns the deaths of 989 children that occurred in NSW in 2018 and 2019, and examines how these deaths relate to trends in child deaths over time. In the two-year period, the deaths of 38 (3.8%) of these 989 children were determined to be ‘reviewable’ deaths because they were the result of abuse or neglect or occurred in suspicious circumstances (19 children), or the child died while they were in care (19 children). No child died in detention during the two-year period.

To understand key trends over time, the 989 deaths in 2018-2019 are considered within the wider context of the 8,302 deaths of infants and children in NSW over the 15-year period, 2005-2019.

## 1.4. Key terms and definitions

**Abuse:** abuse deaths are those which involve an act of violence by any person directly against a child that causes injury or harm leading to death. Excluded from this definition are lawful acts of force which result in the death of a child or young person, for example police discharge of a firearm to bring a dangerous individual under control.

**Child:** a person under the age of 18 years. Unless otherwise stated, a child includes an infant and a young person.

**Child protection history:** a child who has died is considered to have a child protection history if, within the three years before their death, the child and/or a sibling was the subject of a report (ROSH or non-ROSH) about their safety, welfare or wellbeing made to the Department of Communities and Justice (DCJ) or a Child Wellbeing Unit (CWU). This definition is broader than DCJ’s ‘known to DCJ’ definition, which includes children (or their siblings) who were subject to a ROSH report within the three years before their death, as well as where a child was in out of home care at the time of their death. DCJ does not include children (or their siblings) who were the subject of a report screened as non-ROSH or made to a CWU.<sup>2</sup> In this report we provide information against both definitions.

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2. Department of Communities and Justice 2020. Child Deaths 2019 Annual Report: Learning to improve services, NSW Department of Communities and Justice, Sydney.



**Co-sleeping or bed-sharing:** a situation where a child is sleeping with an adult (adults) on a shared surface such as a bed, sofa, or mattress. The term co-sleeping is used when a child is intentionally placed for sleep. Bed-sharing includes situations where an adult carer unintentionally falls asleep with a child while feeding or settling.

**Child Wellbeing Unit (CWU):** CWUs operate within NSW Health, the NSW Police Force and the Department of Education. CWUs assist staff in these agencies meet their mandatory child protection reporting obligations.

**Department of Communities and Justice (DCJ):** formerly known as the Department of Family and Community Services. On 1 July 2019, as part of machinery of Government changes, the former Departments of Family and Community Services and Attorney General and Justice merged to form the Department of Communities and Justice.

**Infant:** a child less than one year (12 months) of age.

**Neonatal period:** the period from birth to aged less than 29 days.

**Neglect:** a death is classified as neglect-related if a reasonable person would conclude that the actions or inactions of a carer exposed the child to a high risk of death or serious injury.

**Out of home care (in care):** for the purposes of the *Children and Young Persons (Care and Protection) Act 1998* (NSW), out of home care means residential care and control of a child or young person that is provided by a person other than a parent of the child or young person, and at a place other than the usual home of the child or young person. There are three types of out of home care provided for in the *Children and Young Persons (Care and Protection) Act 1998*: statutory out of home care (section 135A), supported out of home care (section 135B) and voluntary out of home care (section 135C).<sup>3</sup>

**Perinatal period:** the period commencing at 20 weeks of gestation and ending 28 completed days after birth.<sup>4</sup>

**Post neonatal period:** the period 29 days after birth and within 365 days of birth.

**Risk of significant harm (ROSH):** section 23 of the *Children and Young Persons (Care and Protection) Act 1998* (NSW) defines a child or young person as being at risk of significant harm if current concerns exist for the safety, welfare or wellbeing of the child or young person because of the presence, to a significant extent, of any one or more of the following circumstances:

- a. the child's or young person's basic physical or psychological needs are not being met or are at risk of not being met
- b. the parents or other caregivers have not arranged and are unable or unwilling to arrange for the child or young person to receive necessary medical care
- b1. in the case of a child or young person who is required to attend school in accordance with the *Education Act 1990* (NSW) – the parents or other caregivers have not arranged and are unable or unwilling to arrange for the child or young person to receive an education in accordance with that Act
- c. the child or young person has been, or is at risk of being, physically or sexually abused or ill-treated
- d. the child or young person is living in a household where there have been incidents of domestic violence and, as a consequence, the child or young person is at risk of serious physical or psychological harm
- e. a parent or other caregiver has behaved in such a way towards the child or young person that the child or young person has suffered or is at risk of suffering serious psychological harm
- f. the child was the subject of a prenatal report under section 25 and the birth mother of the child did not engage successfully with support services to eliminate, or minimise to the lowest level reasonably practical, the risk factors that gave rise to the report.

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3. Ibid.

4. Australian Institute of Health and Welfare 2021. Perinatal period. Metadata Online Registry. Accessed from <https://meteor.aihw.gov.au/content/index.phtml/itemId/327314> on 24 March 2021.



**Sudden Unexpected Death in Infancy (SUDI):** the death of an infant that is sudden and unexpected, and where the cause was not immediately apparent at the time of death. Excluded from this definition are infants who died unexpectedly as a result of injury – for example, transport fatalities – and deaths that occurred in the course of a known acute illness in a previously healthy infant. Following investigation, infant deaths classified as SUDI can be explained (where a cause of death is determined) or unexplained (where a cause of death is unable to be determined).

**Suspicious:** a child's death is classified as suspicious where there is evidence that the death may have been the result of abuse or neglect, but the evidence is insufficient for this to be reasonably determined.

**Young person:** a person aged 15 to 17 years.

## 1.5. Methods

### The NSW Child Death Register

The NSW Ombudsman is notified of the deaths of all children aged 0-17 years in NSW by the NSW Registry of Births Deaths and Marriages (BDM). Relevant information is then sourced from government and non-government agencies and service providers, including NSW Health, Department of Education, Department of Communities and Justice, NSW Police, and the Coroner, and held in the Register.

**Cause of death:** The International Statistical Classification of Diseases and Related Health Problems (ICD), 10th revision, is used to code cause of death (based on the underlying cause of death) in this report. Analysis of cause of death in this report relates primarily to underlying cause of death. This is defined as 'disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury'.<sup>5</sup>

**Aboriginal and Torres Strait Islander status:** Since 2012, the CDRT has used a consistent approach to identifying Aboriginal and Torres Strait Islander status, which considers relevant records that may identify a child as Indigenous. The CDRT records Aboriginal and Torres Strait Islander status as identified by BDM birth and death records, as well as status identified through other reliable sources. As the approach was not consistent before 2012, any description of trends in the deaths of Aboriginal and Torres Strait Islander children over the 2005-2019 period is based on identification of Indigenous status in data from the BDM only. For the 2018-2019 period, the broader approach to identifying Aboriginal and Torres Strait Islander children has been used. More details about classification of Aboriginal and Torres Strait Islander status are included in Appendix 3.

**International Classification of Diseases (ICD):** the ICD is the international standard health classification published by the World Health Organization (WHO) for coding diseases for statistical aggregation and reporting purposes.<sup>6</sup> The International Classification of Diseases – Australian Modification (ICD-10-AM) contains additional codes that are useful in the Australian setting but is otherwise equivalent to the ICD-10.

**Remoteness:** a reference to the extent of geographical distance from services. The Australian Bureau of Statistics (ABS) Accessibility and Remoteness Index of Australia (ARIA+) was used to code for geographic remoteness based on the place of usual residence of the child. Remoteness is grouped into five levels: major cities (highly accessible), inner regional (accessible), outer regional (moderately accessible), remote, and very remote areas. In this report, we have generally summarised this variable into two categories: major cities and regional/remote areas.<sup>7</sup>

5. World Health Organization 2010. International Statistical Classification of Diseases and Related Health Problems, 10th Revision. World Health Organisation, Geneva.

6. World Health Organization 2010. International Statistical Classification of Diseases and Related Health Problems, 10th Revision. World Health Organisation, Geneva.

7. Australian Bureau of Statistics 2018. The Australia Statistical Geography Standard (ASGS) Remoteness Structure. Accessed from <http://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness+structure> on 1 March 2021.

**Socio-economic status:** a measure of the relative material resources of an individual or group. The ABS Index of Socio-economic Disadvantage (IRSD) was used to calculate socio-economic status. This results in five quintiles, where Quintile 1 refers to areas of most disadvantage and Quintile 5 refers to areas of least disadvantage. This report uses the results of two of these five quintiles to demonstrate socio-economic disadvantage between the least and most disadvantaged: comparing the results for Quintile 1 with Quintile 5. Full details about all five quintiles are provided in supplementary tables included in the Appendices. To provide a further measure of a family's socio-economic background, it is recommended to examine other indicators of disadvantage.<sup>8</sup> The Index of Education and Occupation (IEO) was used to further examine socio-economic status. The Appendices contain tables which include both IRSD and IEO for each cause of death chapter, and for trends over time.

## Statistical analysis

In this report, the mortality rate was calculated separately for infants aged less than one year and children aged 1-17 years, as below:

**Infant Mortality Rate (IMR):** the rate of infant death per 1,000 live births. In this report, rates are not calculated for numbers less than four because of lack of reliability. The IMR was calculated by dividing the number of infant deaths each year by the number of live births in that year and multiplying it by 1,000.

**Mortality Rate (MR):** the rate of deaths in a given population per 100,000 children (other than Infant Mortality Rates – see definition above). In this report, Mortality Rates are sometimes given for all children, for children aged one to 17 (that is, excluding infants) and, in the case of the chapter relating to suicide (chapter 9), for children aged 10-17. The MR is a crude rate and is calculated by dividing the number of child deaths in a given year by the total population of children in that age group and multiplying it by 100,000. This resulted in a MR of deaths per 100,000 children. The population used for the child MR is clearly articulated in each chapter to avoid confusion. Rates are not calculated for numbers less than five because the small numbers may result in a lack of reliability.

**Statistical significance:** a measure of whether the difference between population groups (such as males and females) or trends over time are significant (less than 5% likely to be due to chance).

Statistical analysis was conducted to determine significant differences by key demographic variables such as gender, age group, Aboriginal and Torres Strait Islander status, remoteness, and socio-economic status.

For full details of our methodology, see Appendix 3.

## 1.6. Deaths of resident children living outside NSW

Information about deaths of children that are registered interstate is generally not available for the current reporting year, 2019. The latest information relates to the 24 deaths of NSW resident children registered in other states or territories in 2017 and 2018.

There were 12 children from NSW who died outside of the state in 2017, and 12 children in 2018. Nearly all (22) children died in states bordering NSW.

The CDRT's jurisdiction is limited to NSW, so we are unable to request agencies in other states or territories to provide information about the deaths of children outside NSW. Limited information is provided by child death review teams (or similar) in other states and territories. For this reason, the deaths of children outside of NSW are not included in the detailed analysis in this report.

As in previous years, the majority of the 24 children were infants (18) and almost all died from natural causes (19). Two children died from injury-related causes. The cause of death for three children is subject to ongoing coronial inquiry.

8. Saunders P 2012. Report for the NSW Child Death Review Team on measuring socio-economic status, prepared by the Social Policy Research Centre. University of New South Wales, Sydney.

## 2. Infant and child deaths: an overview

### **Infants (less than one year)**

In 2018 and 2019, 599 infants died in NSW, reflecting an infant mortality rate of 2.9 deaths per 1,000 live births. Most (86%, 517) infant deaths were due to natural causes and occurred in the first 28 days of life (75%, 446).

Over the past 15 years 2005-2019, the overall infant mortality rate significantly decreased in NSW.

Infant mortality rates in the two-year period, and over time, were higher among Aboriginal and Torres Strait Islander infants than non-Indigenous infants, and higher for infants living in the most socio-economically disadvantaged areas of NSW compared with infants living in the least disadvantaged areas.

### **Children (aged 1-17 years)**

In 2018 and 2019, 390 children aged 1-17 years died in NSW, reflecting a mortality rate of 11.7 deaths per 100,000 children aged 1-17 years. Just over half (52%, 204) of all deaths of children aged 1-17 years were due to natural causes, followed by injury or external causes (39%, 151).

Over the past 15 years, the overall mortality rate among children significantly decreased in NSW, except for suicide among children and young people aged 10-17 years, which significantly increased.

Mortality rates in the two-year period, and over time, were higher among Aboriginal and Torres Strait Islander children than non-Indigenous children, and higher for children living in the most socio-economically disadvantaged areas of NSW compared with children living in the least disadvantaged areas. most socio-economically disadvantaged areas of NSW compared with infants living in the least disadvantaged areas.

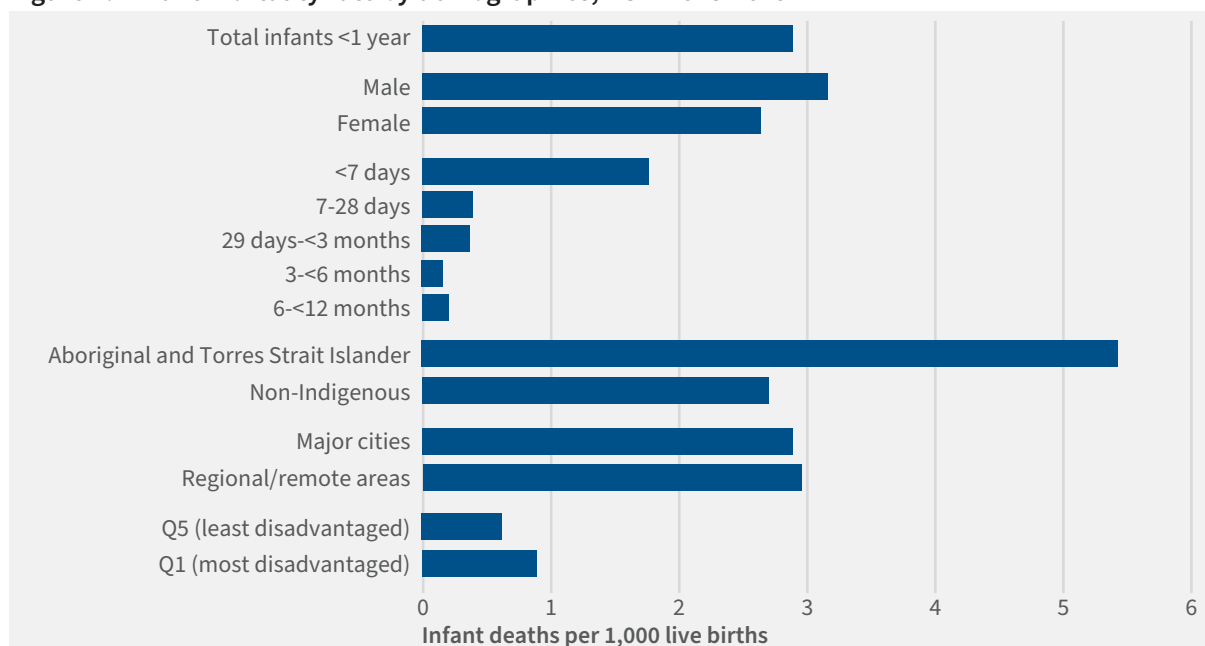
### 2.1. Infant and child deaths in 2018-2019

In the two-year period 2018 and 2019, the deaths of 989 infants and children occurred in NSW. More than half (61%) of these deaths were infants aged less than one year, and 39% were children aged 1-17 years.

#### 2.1.1. Infant deaths by demographics and cause of death

In 2018 and 2019, 599 infants died in NSW, reflecting an overall infant mortality rate (IMR) of 2.9 deaths per 1,000 live births. Infants less than one week had a significantly higher IMR (2.9 times higher) than infants aged 29 days to one year. Aboriginal and Torres Strait Islander infants also had a significantly higher IMR (2.0 times higher) than non-Indigenous infants.

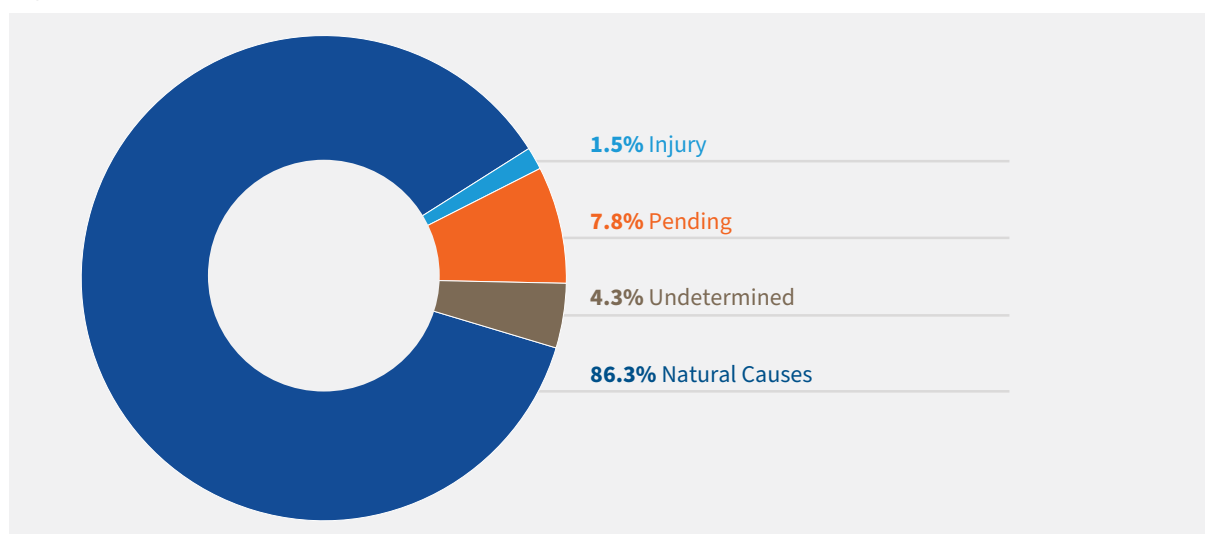
**Figure 1. Infant mortality rate by demographics, NSW 2018-2019**



Most infant deaths in 2018 and 2019 were due to natural causes (86%, 517). Injury accounted for two percent of infant deaths (9). Cause of death was either undetermined (26) or still under investigation (47) for a further 12% of infant deaths.

Eighty (13%) of the 599 infants who died in 2018-2019 were classified as Sudden Unexpected Death in Infancy (SUDI), which is discussed in more detail in Chapter 4.

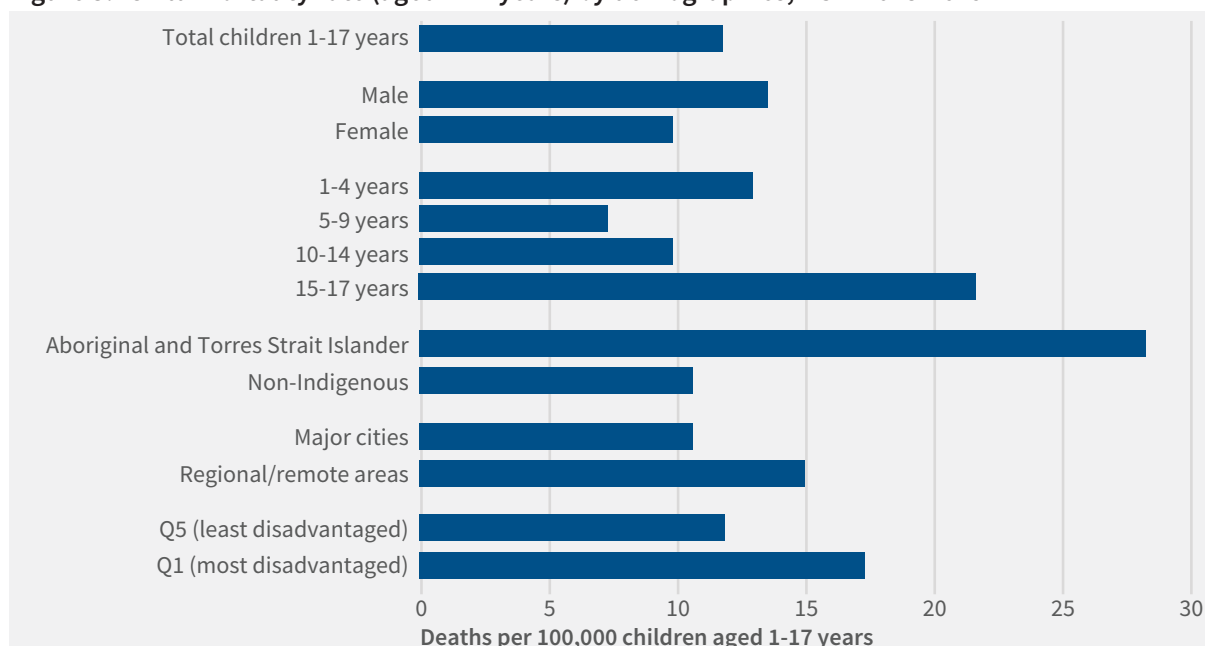
**Figure 2. Proportion of infant deaths by causes of death, NSW 2018-2019**



### 2.1.2. Child deaths by demographics and cause of death

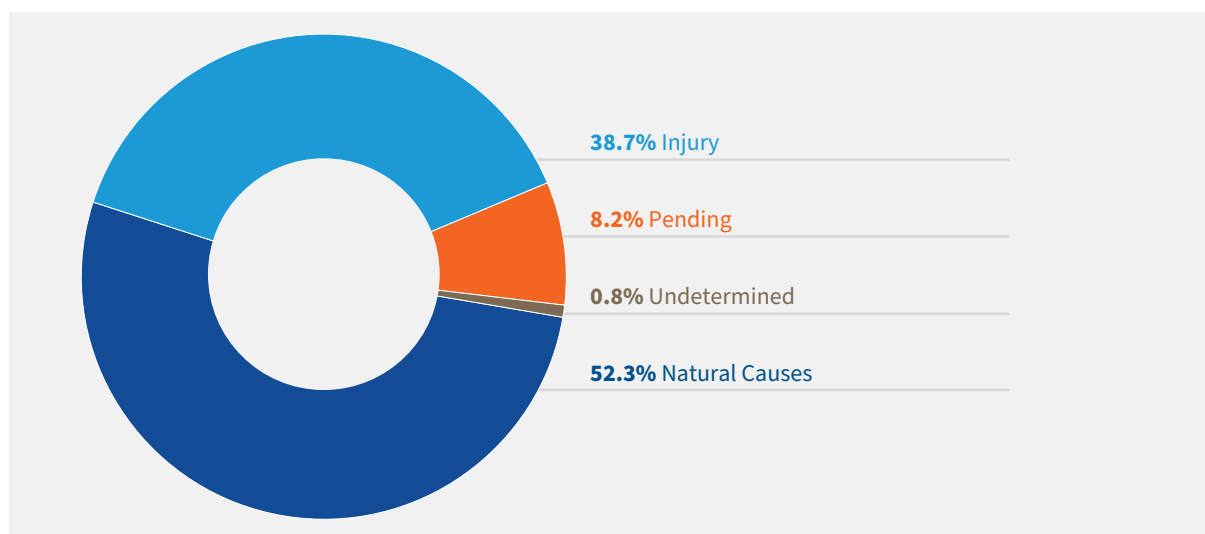
In 2018 and 2019, 390 children aged 1-17 years died in NSW, a mortality rate of 11.7 deaths per 100,000 children. Higher mortality rates were found for males (1.4 times higher than females), Aboriginal and Torres Strait Islander children (2.7 times higher than non-Indigenous children) and for young people aged 15-17 years (2.2 times higher than children aged 1-14 years).

**Figure 3. Child mortality rate (aged 1-17 years) by demographics, NSW 2018-2019**



In 2018 and 2019, just over half the deaths of children aged 1-17 years were due to natural causes (52%, 204), followed by injuries (39%, 151). A cause of death was unable to be determined for three children, and at the time of writing was still pending for the remaining cases (32).

**Figure 4. Proportion of children (aged 1-17 years) deaths by causes of death, NSW 2018-2019**



### 2.1.3. Child protection history

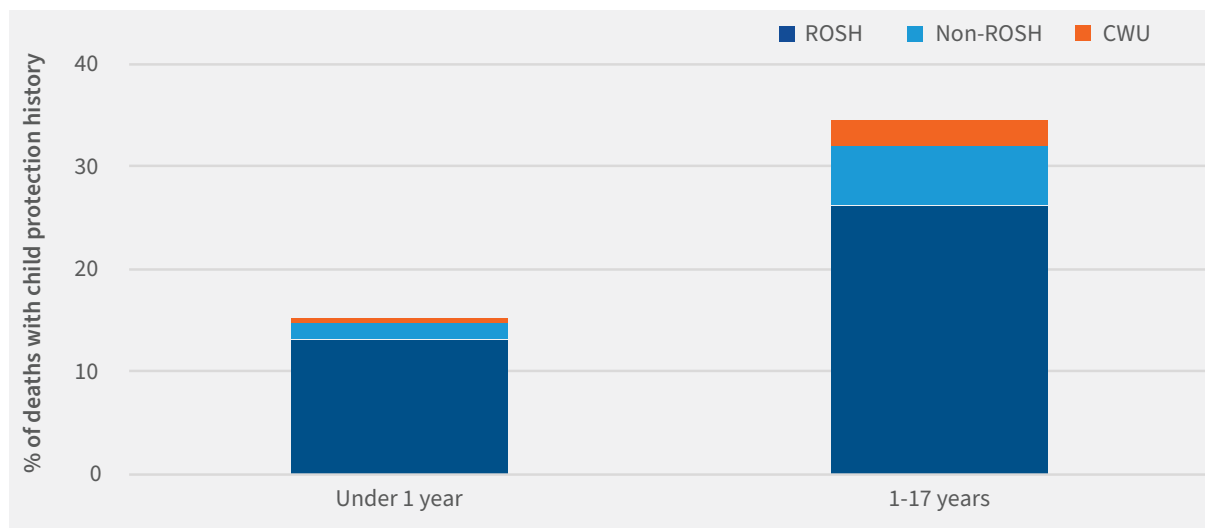
On average, almost one in every four (23%, 224) of the 989 infants and children who died in 2018 and 2019 were from families with a child protection history.<sup>9</sup> This is disproportionate to the number of infants and children aged 0-17 years overall in NSW who are known to child protection authorities, which was just over 3% (1 in 33) in 2018-2019.<sup>10</sup>

In most instances (80%, 180), the infant or child who died (and/or a sibling) was the subject of a report screened as meeting the ‘risk of significant harm’ (ROSH) threshold.

9. A child protection history includes reports about safety, welfare or wellbeing made to DCJ and screened as either ROSH or non-ROSH, or to Child Wellbeing Unit.

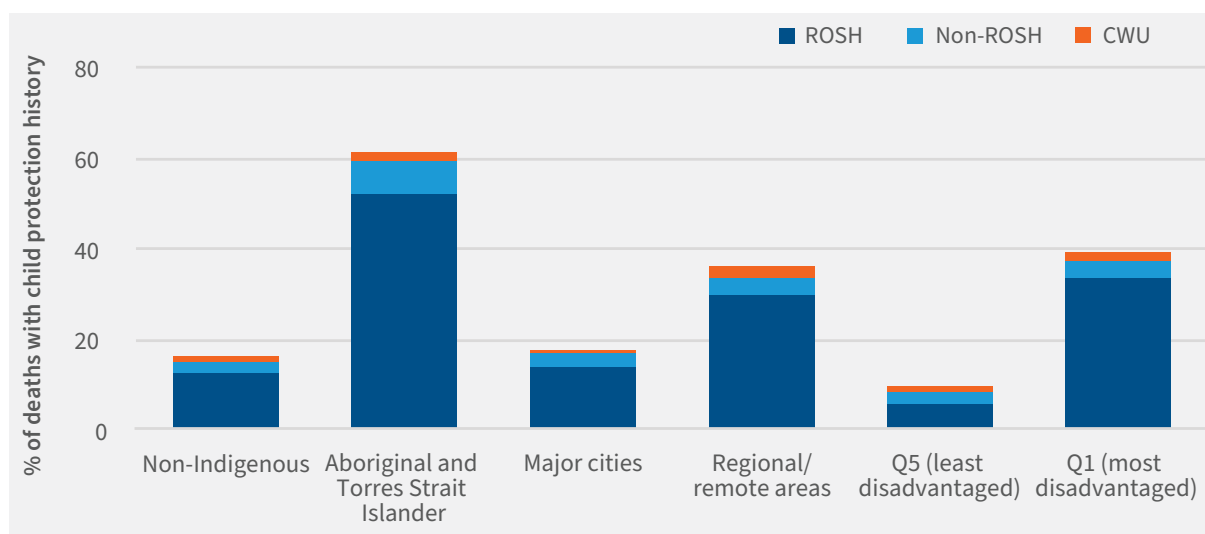
10. Australian Institute of Health and Welfare 2020. Child protection Australia 2018-19. Child Welfare Series No. 72. Cat no. CWS 74. Australian Institute of Health and Welfare, Canberra. Accessed from <https://www.aihw.gov.au/reports/child-protection/child-protection-australia-2018-19/summary> on 23 April 2021.

**Figure 5. Proportion of report types among infants and children with a child protection history, NSW 2018-2019**



The proportion of infants and children with a child protection history was higher in certain groups, including those of Aboriginal and Torres Strait Islander background (61%), those living in regional and remote areas of NSW (36%), and those living in the most disadvantaged areas (39%).

**Figure 6. Proportion of report types among infants and children with a child protection history by demographics, NSW 2018-2019**



## 2.2. Leading causes of death in 2018-2019

In 2018 and 2019, the leading underlying cause of death for all infants and children aged 0-17 years was perinatal conditions (32.9%, 325), followed by congenital conditions (17.9%, 177) and cancer and tumours (8.1%, 80).

The leading underlying cause of death varies according to the age of the child, as outlined in Table 1 below. The top two underlying causes of death by age group included:

- Infants <1 year: perinatal conditions (54.2%, 325), congenital conditions (24.9%, 149)
- 1-4 years: cancers and tumours (18.4%, 19), nervous system (8.7%, 9)
- 5-9 years: cancers and tumours (24.3%, 18), respiratory system (12.2%, 9)
- 10-14 years: cancers and tumours (18.9%, 18), transport (14.7%, 14)
- 15-17 years: suicide (34.7%, 41), transport (21.2%, 25)

Table 1. Top 5 leading causes of death for infants and children by age group, NSW 2018-2019

	1st	2nd	3rd	4th	5th
Under 1 year	Perinatal	Congenital	Cancers and tumours	Endocrine	Nervous system
1-4 years	Cancers and tumours	Nervous system	Respiratory system	Congenital	Transport
5-9 years	Cancers and tumours	Respiratory system	Congenital	Transport	Nervous system or endocrine
10-14 years	Cancers and tumours	Transport	Nervous system	Suicide	Congenital or endocrine
15-17 years	Suicide	Transport	Cancers and tumours	Nervous system	Circulatory system
Total 0-17 years	Perinatal	Congenital	Cancers and tumours	Transport	Suicide

### 2.3. Reviewable deaths in 2018-2019

The NSW Ombudsman has a separate responsibility for reviewing the deaths of children in circumstances of abuse or neglect, and the deaths of children in care or detention.

In this two-year period, 38 of the 989 deaths (3.8%) were reviewable by the Ombudsman (7 infants and 31 children) because they died as a result of abuse (15) or neglect (2), in suspicious circumstances (2), or were living in care (19).

The majority of infants and children in care (12 of 19) died from natural causes. These deaths are considered in Chapter 3. Seven children in care died from injury (see Chapter 5), including two children who died by suicide (Chapter 9). Deaths of infants and children that occurred in circumstances of abuse or neglect are discussed in Chapter 10.

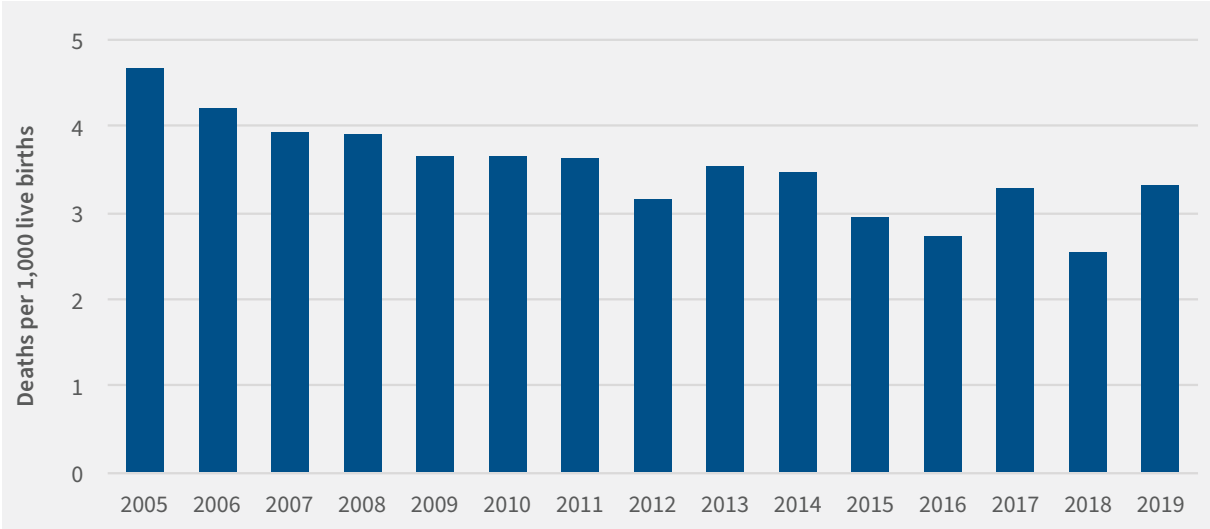
## 2.4. Trends in infant and child deaths, 2005-2019

Over the 15-year period 2005-2019, the overall mortality rate for all infants and children (0-17 years) has declined by 30%, from 41.48 to 29.16 per 100,000 children. As infant and child mortality rates and trends are different, however, the following sections consider infants and children separately.

### 2.4.1. Infant deaths by year, demographics, and cause

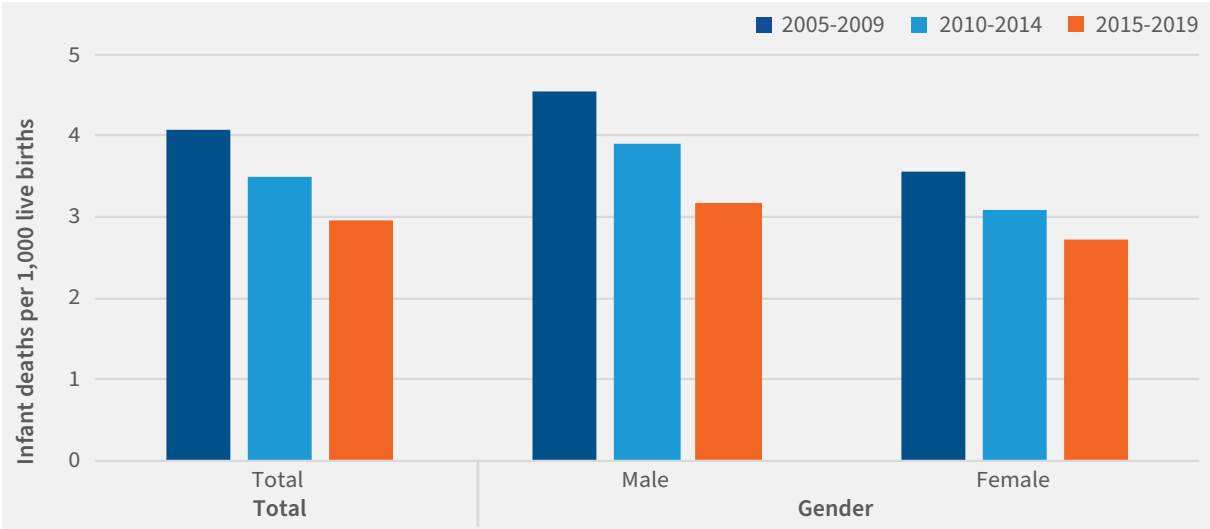
Over the 15 years to 2019, there was a significant overall decrease in the infant mortality rate from 4.7 deaths per 1,000 live births in 2005 to 3.3 deaths per 1,000 live births in 2019.

Figure 7. Infant mortality rate by year, NSW 2005-2019



Between 2005-2019, more than half (57%) the infants who died were male; there has been little change in this proportion annually over the 15-year period. Infant mortality decreased for both males and females over this time, and the gap in mortality rate by gender has narrowed.

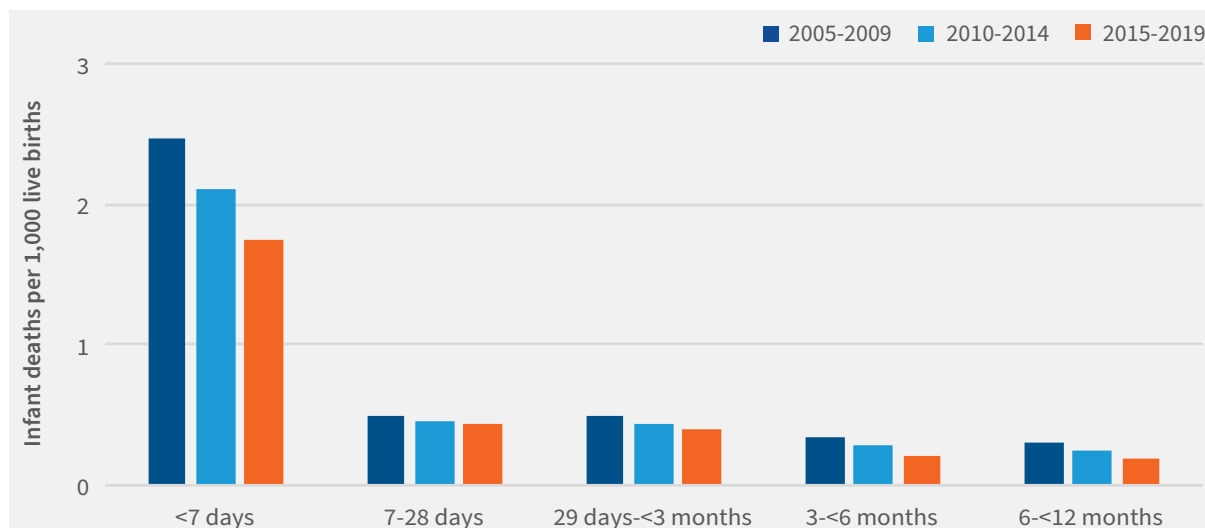
Figure 8. Infant mortality rate by gender, NSW 2005-2019



The majority (60%) of infants who died were less than one week old, which has consistently been the case over time. These very young infants showed the largest decrease in mortality over the 15-year period. Infant mortality also decreased slightly in all other infant age groups during this period.



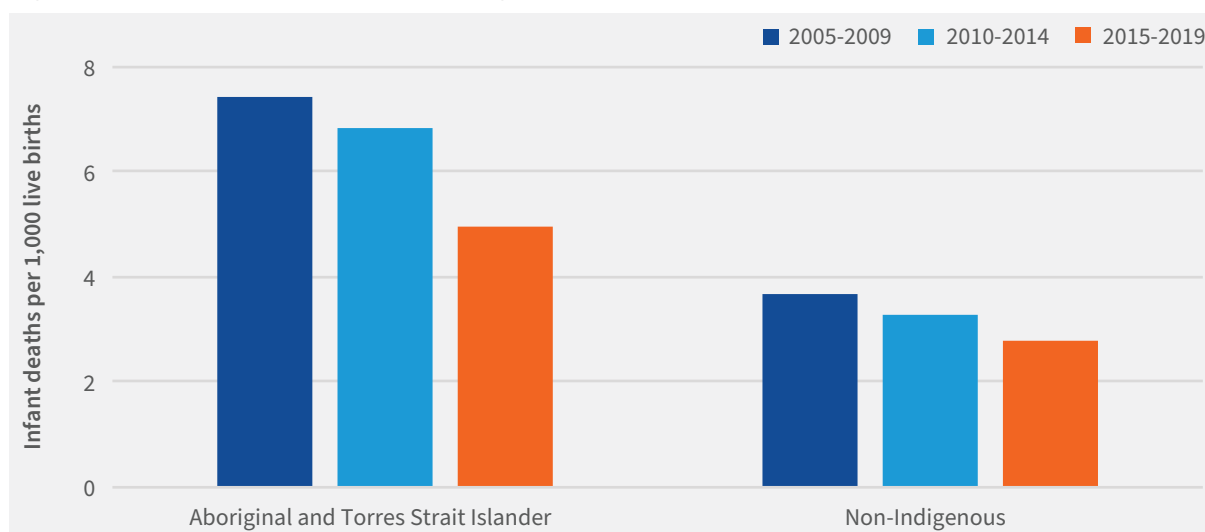
**Figure 9. Infant mortality rate by age group, NSW 2005-2019**



Aboriginal and Torres Strait Islander infants are over-represented in infant deaths, accounting for 10.3% of all infant deaths between 2005-2019.

While there were significant decreases in the infant mortality rate for both Aboriginal and Torres Strait Islander infants and for non-Indigenous infants over the 15 years – overall, the rate for Aboriginal and Torres Strait Islander infants was 1.9 times higher than non-Indigenous infants.

**Figure 10. Infant mortality rate by Aboriginal and Torres Strait Islander status, NSW 2005-2019**

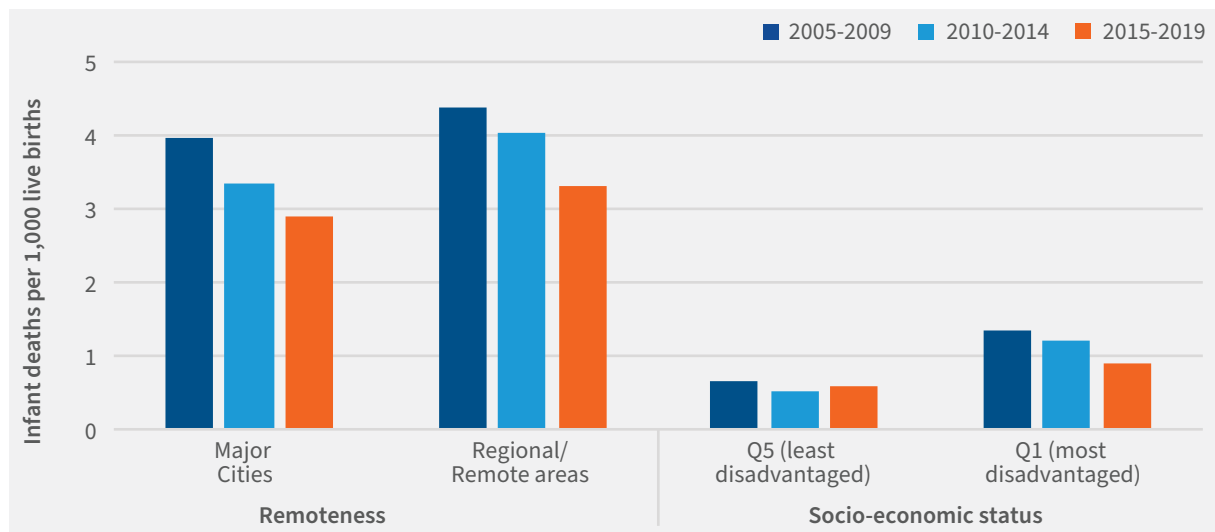


There were significant decreases in the mortality rate between 2005-2019 for all infants regardless of whether they lived in a major city or regional area of NSW. However, infants living in regional and remote parts of NSW had a slightly higher (1.2 times higher) mortality rate compared to infants living in major cities.<sup>11</sup>

11. Remoteness was determined using ABS accessibility and remoteness index of Australia (ARIA). Regional and remote areas include outer and inner regional areas, as well as remote and very remote areas.

One-third of infants who died lived in the most socio-economically disadvantaged areas of NSW (Quintile 1), with the remaining two-thirds equally distributed among other quintiles.<sup>12</sup> Infants from the most socio-economically disadvantaged area (Quintile 1) had a mortality rate 2.0 times higher than infants from the least disadvantaged areas (Quintile 5).

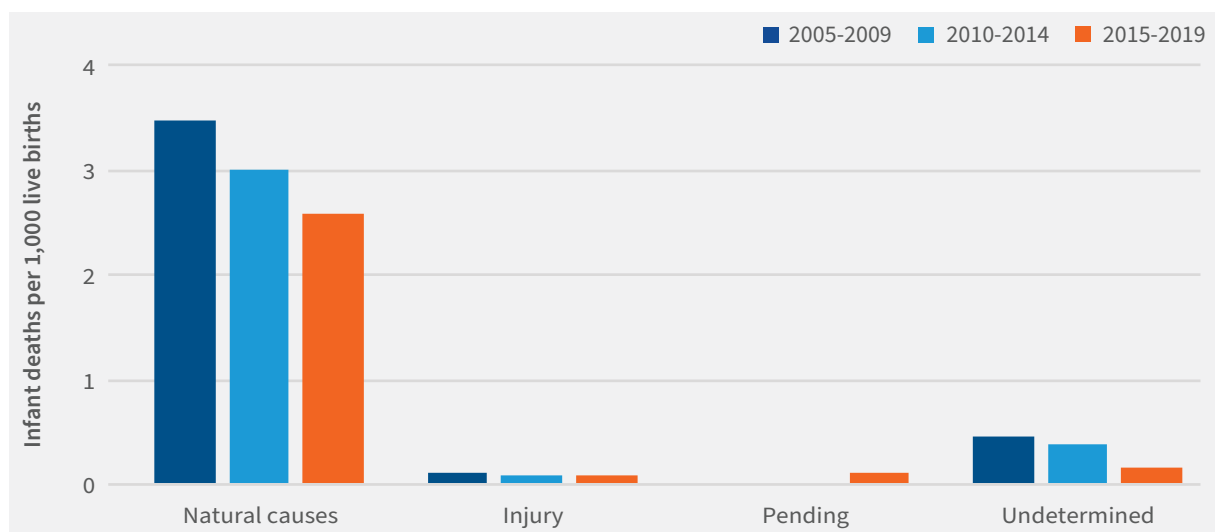
**Figure 11. Infant mortality rate by remoteness and socio-economic status, NSW 2005-2019**



Between 2005-2019, the majority (86.5%, 4,433) of the 5,122 infant deaths were due to natural causes. Cause of death for the remaining 689 infants was either undetermined (9.7%, 496), due to injury (2.7%, 137) or pending finalisation (1.1%, 56).

Over this 15-year period, the infant mortality rate significantly decreased for both natural causes and injury-related causes.

**Figure 12. Infant mortality rate by cause of death, NSW 2005-2019**

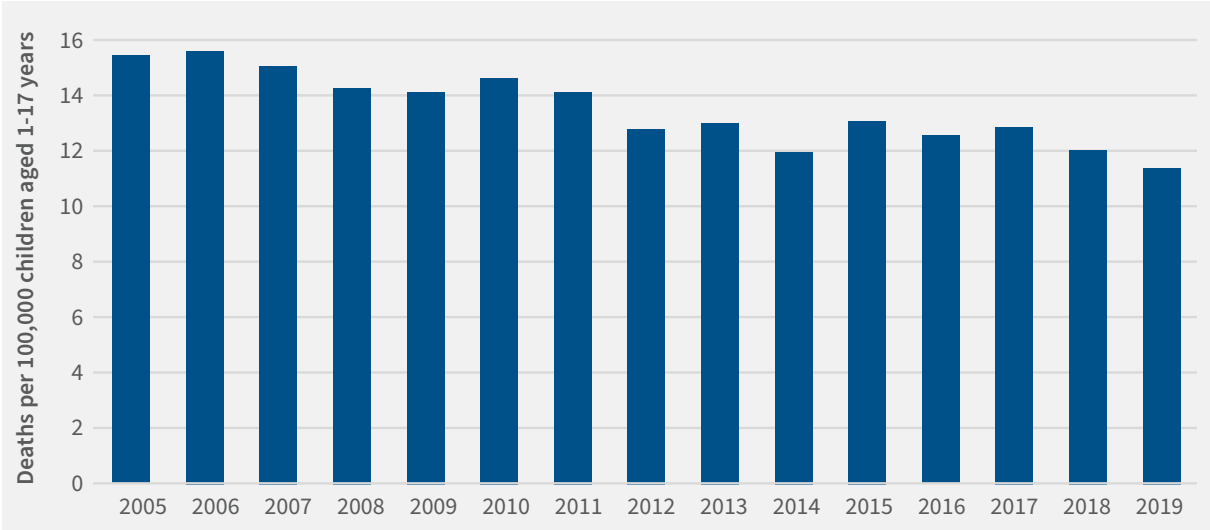


12. Socio-economic status was determined using the ABS Index of socio-economic disadvantage (IRSD) which categorises disadvantage using five quintiles with Q1 representing people living in the most disadvantaged areas of NSW and Q5 representing people living in the least disadvantaged areas of NSW.

### 2.4.2. Child deaths by year, demographics, and cause

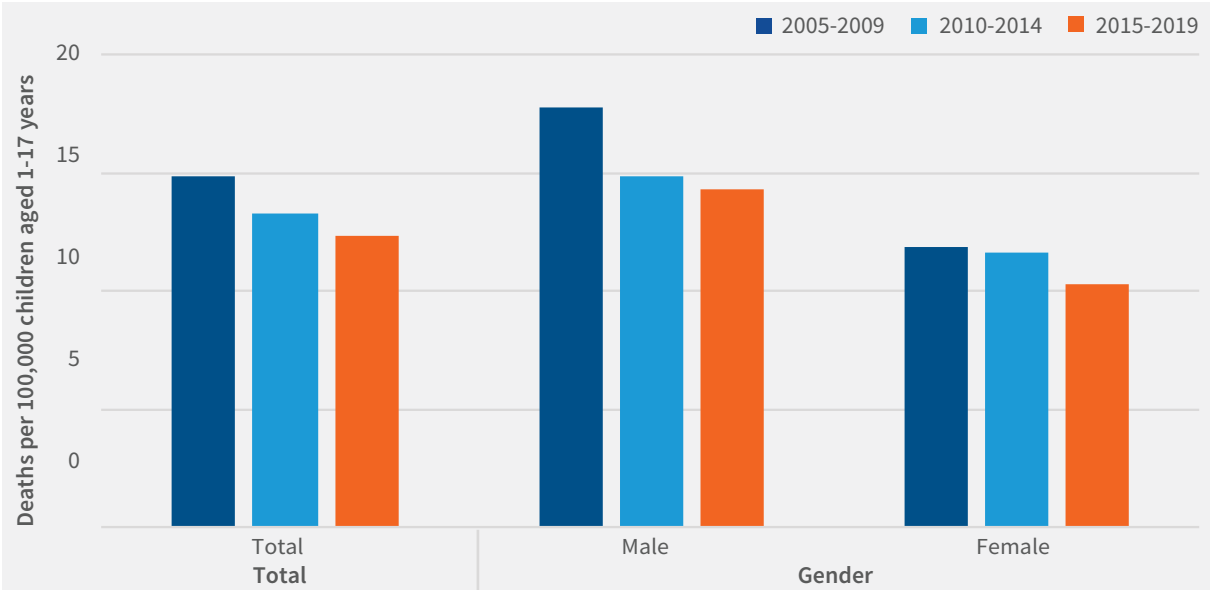
Between 2005-2019, there was a significant decrease in the mortality rate of children aged 1-17 years from 15.4 deaths per 100,000 children in 2005 to 11.4 deaths per 100,000 children in 2019.

Figure 13. Child mortality rate (aged 1-17 years) by year, NSW 2005-2019



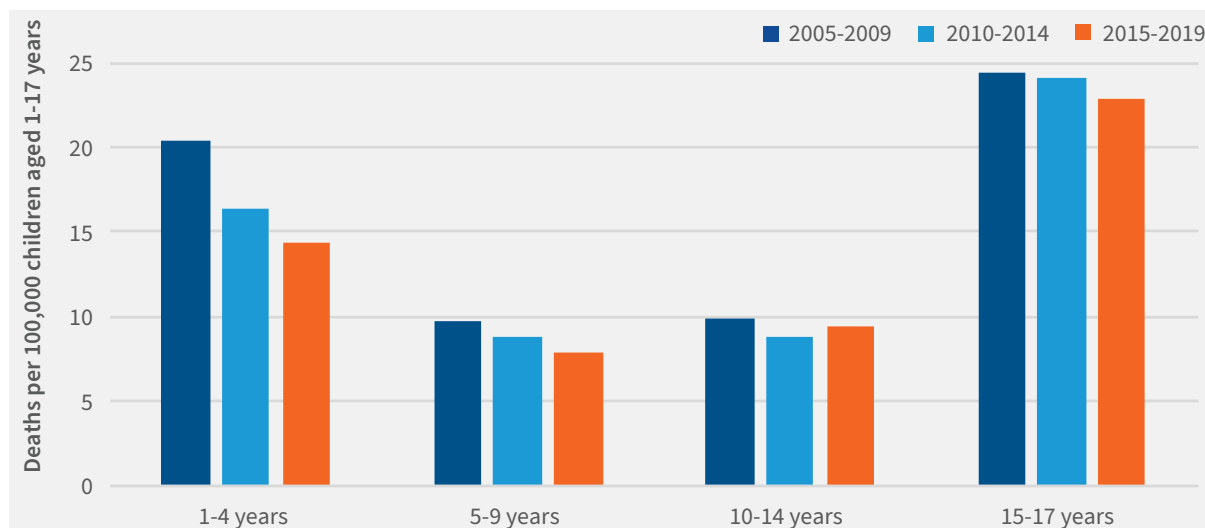
Among children aged 1-17 years, males consistently accounted for over half (59%) of the deaths during the 15-year period. The mortality rate declined for both males and females over this period, and the gap between the rate for males and females narrowed.

Figure 14. Child mortality rate (aged 1-17 years) by gender, NSW 2005-2019



Young people aged 15-17 years had the highest mortality rate of any age group, followed by children aged 1-4 years. There was a decline in the overall mortality rate for all age groups over the 15-year period, with the sharpest decline found among children aged 1-4 years.

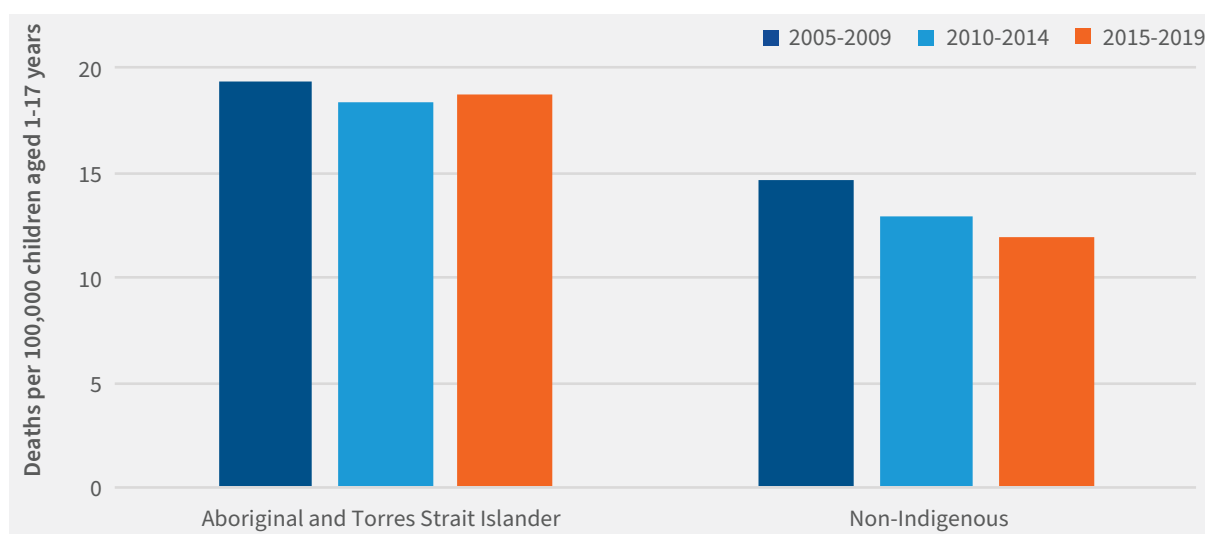
**Figure 15. Child mortality rate (aged 1-17 years) by age group, NSW 2005-2019**



Aboriginal and Torres Strait Islander children were over-represented in the deaths of children aged 1-17, accounting for 8.6% of all deaths in the 15-year period, and a mortality rate 1.4 times higher than non-Indigenous children.

Children aged 1-17 years of non-Indigenous background had a significantly decreased mortality rate over the 15-year period. A similar decrease in mortality rate was not observed for Aboriginal and Torres Strait Islander children.

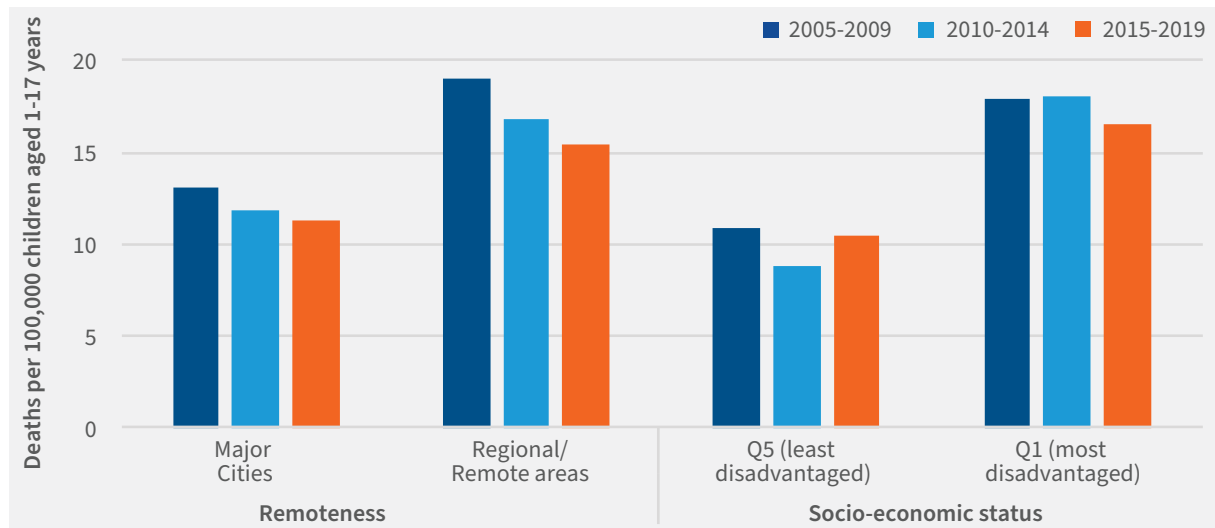
**Figure 16. Child mortality rate (aged 1-17 years) by Aboriginal and Torres Strait Islander status, NSW 2005-2019**



Over the 15-year period, children living in regional and remote areas had a mortality rate 1.4 times higher than children living in major cities.

The mortality rate for children living in the most socio-economically disadvantaged areas of NSW was 1.7 times higher than for children living in the least disadvantaged areas.

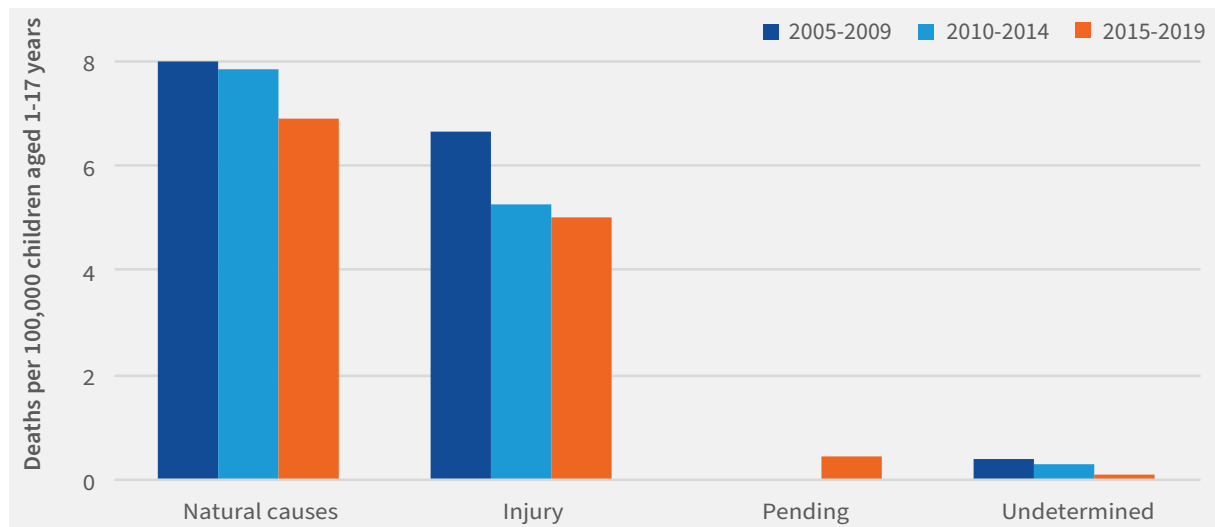
**Figure 17. Child mortality rate (aged 1-17 years) by remoteness and socio-economic status, NSW 2005-2019**



Of the 3,180 children aged 1-17 years who died between 2005-2019, more than half (56%) died from natural causes, 41% died from injury-related causes, and for the remaining 3% the cause of death was pending or undetermined.

Over this period, the overall mortality rates significantly decreased for both natural causes and injury-related causes.

**Figure 18. Child mortality rate (aged 1-17 years) by cause of death, NSW 2005-2019**



### 2.4.3. Trends in leading causes of deaths, 2005-2019

There was some variation in the leading underlying cause of death by age group over the 15-year period, outlined in Table 2 below. For infants, and children aged 5-9 years, there has been little change. There are, however, some notable variations in the top leading cause within some age groups:

- 1-4 years: change from drowning in 2005-2009 to cancers and tumours in 2010-2019
- 10-14 years: change from transport in 2005-2009 to cancers and tumours in 2010-2019
- 15-17 years: change from transport in 2005-2014 to suicide in 2015-2019

Table 2. Top 5 leading causes of death for infants and children by age group and year, NSW 2005-2019

	Years	1st	2nd	3rd	4th	5th
Under 1 year	2005-2009	Perinatal	Congenital	Nervous system	Endocrine	Accidental threats to breathing
	2010-2014	Perinatal	Congenital	Nervous system	Accidental threats to breathing	Endocrine
	2015-2019	Perinatal	Congenital	Nervous system	Accidental threats to breathing	Respiratory system
1-4 years	2005-2009	Drowning	Cancers and tumours	Transport	Nervous system	Congenital
	2010-2014	Cancers and tumours	Congenital	Drowning	Respiratory system	Nervous system
	2015-2019	Cancers and tumours	Drowning Transport Congenital	Nervous system	Respiratory system	Endocrine
5-9 years	2005-2009	Cancers and tumours	Transport	Nervous system	Congenital	Circulatory system Drowning
	2010-2014	Cancers and tumours	Transport	Nervous system	Congenital	Drowning
	2015-2019	Cancers and tumours	Transport	Endocrine	Nervous system	Congenital
10-14 years	2005-2009	Transport	Cancers and tumours	Nervous system	Circulatory system	Congenital
	2010-2014	Cancers and tumours	Nervous system	Transport	Congenital	Suicide
	2015-2019	Cancers and tumours	Transport	Suicide	Nervous system	Respiratory system
15-17 years	2005-2009	Transport	Suicide	Cancers and tumours	Nervous system	Circulatory system
	2010-2014	Transport	Suicide	Cancers and tumours	Nervous system	Endocrine
	2015-2019	Suicide	Transport	Cancers and tumours	Nervous system	Circulatory system

For gender, there was no difference in the top two leading underlying causes of death between 2005-2019. Cancers and tumours were the third leading cause of death for both males and females for all 5-year periods except for males in 2005-2009.

The fourth and fifth leading cause of death for males and females was mostly transport and nervous system disorders over the 15-year period, except for males in 2015-2019 where suicide became the fifth leading cause of death.

**Table 3. Top 5 leading causes of death for infants and children by gender and year, NSW 2005-2019**

	Years	1st	2nd	3rd	4th	5th
Females	2005-2009	Perinatal	Congenital	Cancers and tumours	Transport	Nervous system
	2010-2014	Perinatal	Congenital	Cancers and tumours	Nervous system	Transport
	2015-2019	Perinatal	Congenital	Cancers and tumours	Nervous system	Transport
Males	2005-2009	Perinatal	Congenital	Transport	Cancers and tumours	Nervous system
	2010-2014	Perinatal	Congenital	Cancers and tumours	Transport	Nervous system
	2015-2019	Perinatal	Congenital	Cancers and tumours	Transport	Suicide

Similarly, there was no difference in the top two leading underlying causes of death when comparing Aboriginal and Torres Strait Islander children with non-Indigenous children over the 15-year period to 2019.

However, the third to fifth underlying causes of death for Aboriginal and Torres Strait Islander children were more likely to be related to an injury cause (such as transport, suicide or drowning) compared to non-Indigenous children. Of particular concern, suicide increased to the third leading cause of death among Aboriginal children in 2015-2019.

**Table 4. Top 5 leading causes of death for infants and children by Aboriginal and Torres Strait Islander status and year, NSW 2005-2019**

	Years	1st	2nd	3rd	4th	5th
Aboriginal and Torres Strait Islander	2005-2009	Perinatal	Congenital	Transport	Drowning	Cancers and tumours
	2010-2014	Perinatal	Congenital	Transport	Suicide	Drowning
					Nervous system	Respiratory system
2015-2019	Perinatal	Congenital	Transport Suicide	Cancers and tumours	Respiratory system	
Non-Indigenous	2005-2009	Perinatal	Congenital	Transport	Cancers and tumours	Nervous system
	2010-2014	Perinatal	Congenital	Cancers and tumours	Transport	Nervous system
	2015-2019	Perinatal	Congenital	Cancers and tumours	Transport	Suicide

#### 2.4.4. Trends in reviewable deaths, 2010-2019

Over the 10-year period, 214 of 5,234 deaths (4%) were reviewable by the Ombudsman, including 40 infants (aged less than one year), and 174 children (aged 1-17 years).

Approximately half (51%, 109) of these deaths were reviewable because the infants and children were in care at the time they died, and of these, 61 (56%) died from natural causes.

Just under one-half of the deaths were reviewable because the children died as a result of abuse (69), neglect (18), or in suspicious circumstances (18). Two children who died in circumstances of abuse were living in care at the time.

## 2.5. Observations

### 2.5.1. Infant and child mortality rates in NSW are declining overall

Infant and child mortality rates significantly declined in NSW between 2005-2019, in both natural and injury-related causes. Nearly two-thirds (62%) of all child deaths in NSW were infants (aged less than one year), and 38% were children (aged 1-17 years). Males had consistently higher mortality rates among both infants and children compared to females over the 15-year period, but the gender gap has narrowed for both infants and children over time.

### 2.5.2. Some infants and children have higher mortality rates than others

Aboriginal and Torres Strait Islander infants and children are over-represented in deaths in NSW; accounting for 10.3% of infant deaths (compared to 5.7% of births), and 8.6% of child deaths (compared to 6.2% of the child population). The federal government's *Closing the Gap* target was to halve the gap in national mortality rates between Indigenous and non-Indigenous children aged 0-4 years by 2018.<sup>13</sup> The 2020 Prime Minister's report indicated that the Indigenous child mortality rate for aged 0-4 years was more than twice the rate for non-Indigenous children and had improved by around 7% in 2018.<sup>14</sup>

NSW data shows a slight narrowing of the gap between infant mortality for Aboriginal and Torres Strait Islander infants and non-Indigenous infants (from 1.9 times higher over the 15-year period 2005-2019, to 1.8 times higher in the last five years, 2015-2019). However, among Aboriginal and Torres Strait Islander children aged 1-17 years in NSW, the child mortality gap has increased from 1.4 times higher than non-Indigenous children over the 15-year period to 1.6 times higher for the last five years, 2015-2019.

Inequalities were also evident among infants and children who resided in regional and remote parts of NSW, with infants less than one year having a mortality rate 1.2 times higher, and children aged 1-17 years having a mortality rate 1.4 times higher, than those living in major cities. Similarly, infants and children who resided in the most socio-economically disadvantaged areas of NSW had a higher mortality rate than those who lived in the least socio-economically disadvantaged areas (2.0 times higher for infants and 1.7 times higher for children). There is, of course, likely to be significant intersection between these categories, including Aboriginal and Torres Strait Islander status, regional and remote residence, and areas of socio-economic disadvantage.

### 2.5.3. Cause of death trends differ for infants and children

There were some notable differences in cause of death for infants and children between 2005-2019. Specifically, natural cause deaths were more common in infants (86.5%) than in children (55.7%) and injuries were more common in children (41.2%) compared to infants (2.7%). An undetermined cause of death was more likely among infants (9.7%) than among children (1.9%).

13. Department of Prime Minister and Cabinet 2020. *Closing the gap* Prime Minister's Report 2020. Commonwealth of Australia, Canberra.

14. Australian Institute of Health and Welfare 2018. *Australia's health 2018*. Australia's health series no. 16. AUS 221. Australian Institute of Health and Welfare, Canberra.



### 3. Natural causes

#### INFANTS (less than one year)

In 2018 and 2019, 517 infants died from natural causes. Most of these infant deaths occurred in the first week of life due to perinatal conditions.

Over the 15 years to 2019, the natural cause infant mortality rate significantly decreased in NSW – mostly because of significant declines in deaths due to perinatal conditions.

#### CHILDREN (aged 1-17 years)

In 2018 and 2019, 204 children died from natural causes. The biggest proportion of these deaths (one-third) were due to cancer.

Over the past 15 years, the mortality rate from natural causes among children significantly decreased in NSW. Leading natural causes of child mortality over this 15-year period included cancer, diseases of the nervous system, and congenital conditions.

### 3.1. Natural cause infant and child deaths in 2018-2019

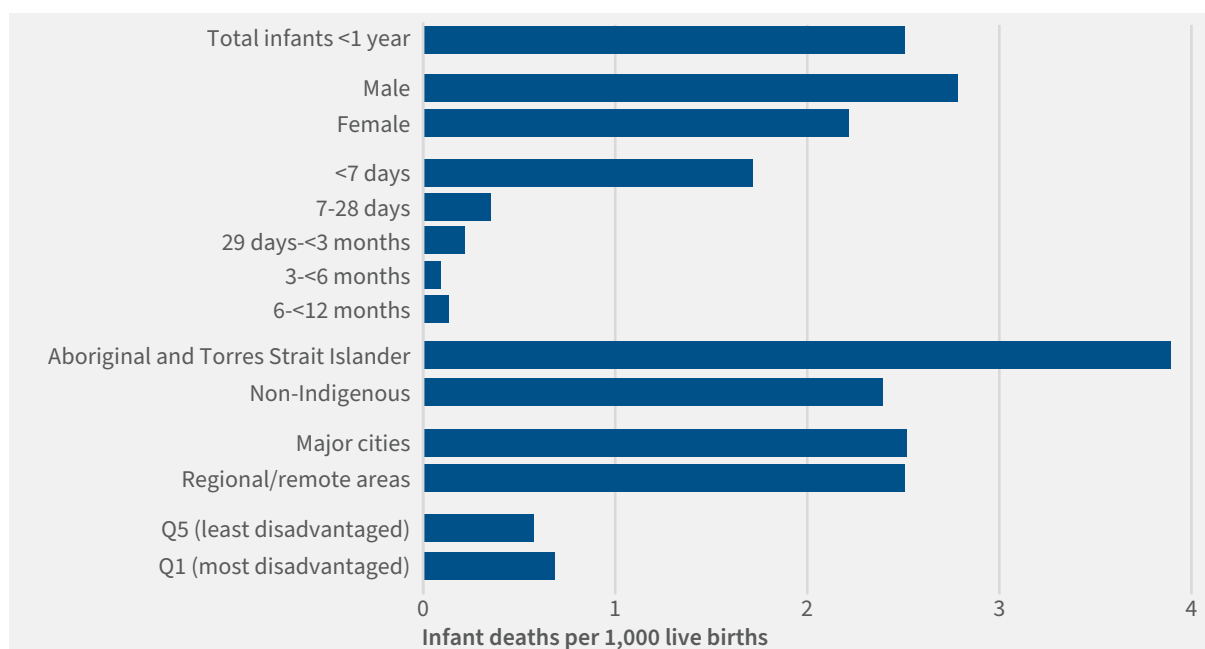
This chapter provides an overview of 721 infants and children who died from natural causes in 2018 and 2019. Nearly three-quarters (72%, 517) of these deaths were infants aged less than one year, reflecting an infant mortality rate of 2.5 deaths per 1,000 live births. The remaining quarter (28%, 204) were children aged 1-17 years, reflecting a mortality rate of 6.1 deaths per 100,000 children aged 1-17 years.

Of the 721 deaths, 12 were reviewable by the NSW Ombudsman. All of these deaths were reviewable because the infants or children were in care.

#### 3.1.1. Natural cause deaths among infants by demographics

In 2018 and 2019, over two-thirds (355) of the 517 infants who died from natural causes were less than one week old. This proportion has remained stable over the 15-year period to 2019.

Figure 19. Natural cause infant mortality rate by demographics, NSW 2018-2019

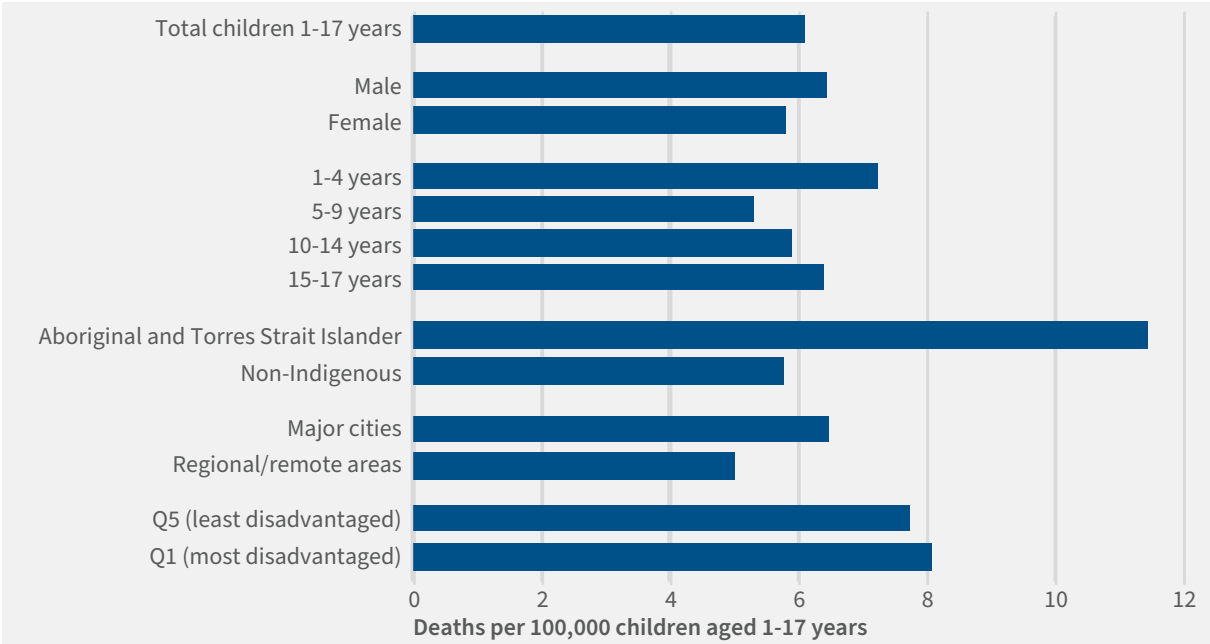


### 3.1.2. Natural cause deaths among children by demographics

In 2018 and 2019, Aboriginal and Torres Strait Islander children aged 1-17 years who died from natural causes accounted for 12% of deaths and had a mortality rate from natural causes that was 2.0 times higher than non-Indigenous children. Over the past 15 years the mortality rate for natural causes for Aboriginal children has fluctuated; however overall, it has been consistently higher than for non-Indigenous children.

In 2018 and 2019, there were no significant differences in the pattern of natural cause deaths among children by other demographic characteristics, such as age and gender.

**Figure 20. Natural cause child mortality rate (aged 1-17 years) by demographics, NSW 2018-2019**



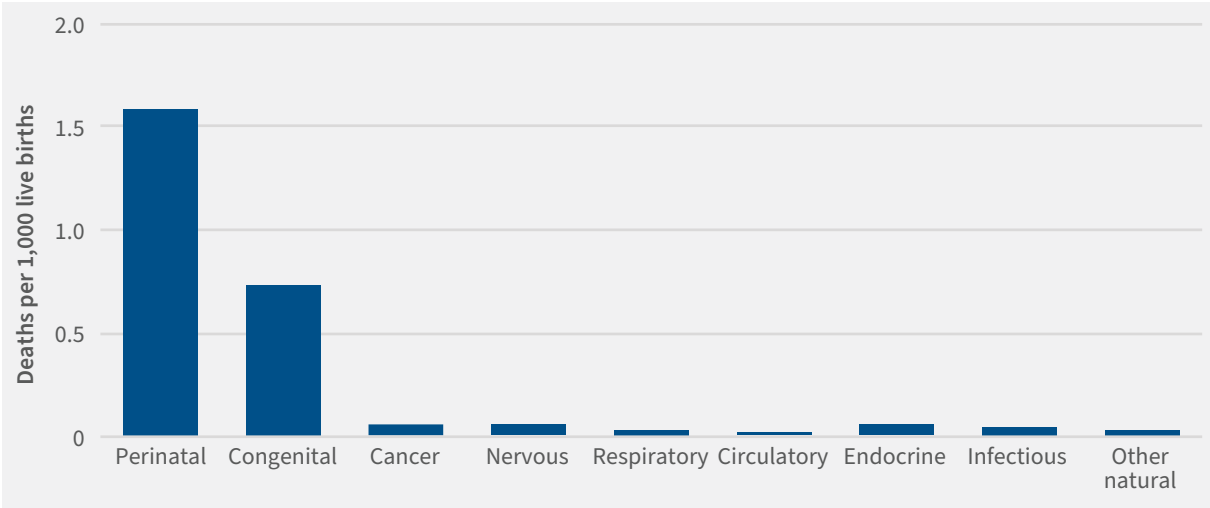
### 3.1.3. Leading causes of death among infants

In 2018 and 2019, the leading natural cause of death for infants aged less than one year was perinatal conditions followed by congenital conditions.

Perinatal conditions accounted for nearly two-thirds (63%, 325) of the 517 infants who died from natural causes in the two-year period. Perinatal conditions originate during pregnancy or up to 28 completed days after birth. It includes conditions such as prematurity, respiratory and cardiovascular disorders, haemorrhagic and haematological disorders, and complications of pregnancy. Although the conditions originate during the perinatal period, they can result in death later in life.

Congenital conditions accounted for 149 (29%) of infant deaths from natural causes in 2018-2019. Congenital conditions are abnormalities that are present from birth. They include anatomical defects such as congenital heart malformations and neural tube defects, and disorders with developmental consequences such as Down’s syndrome and cerebral palsy.

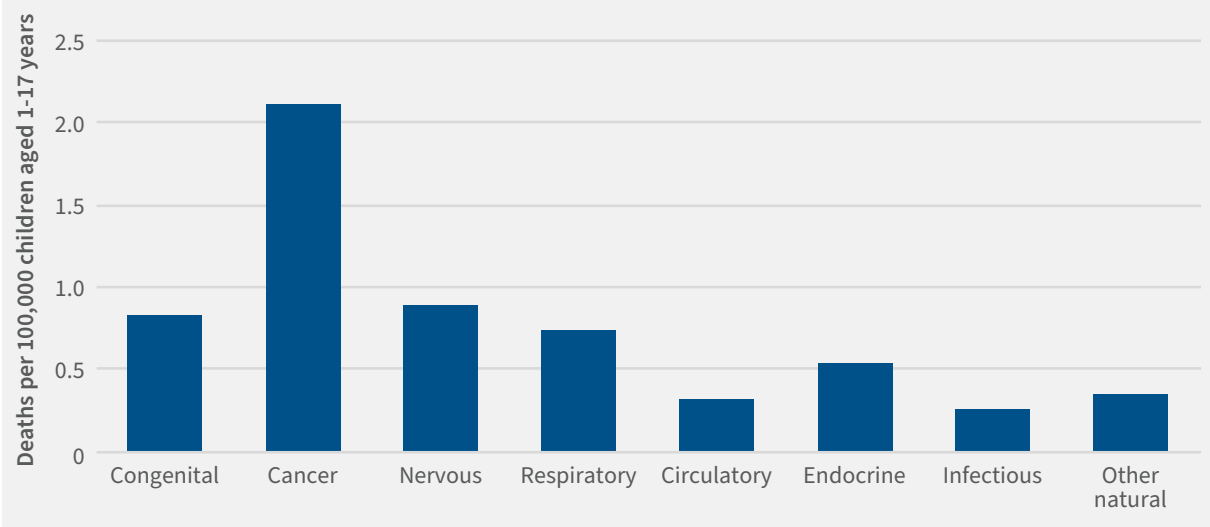
**Figure 21. Natural cause infant mortality rate by cause of death, NSW 2018-2019**



**3.1.4. Leading causes of death among children**

Among the 204 children aged 1-17 years who died from natural causes in 2018 and 2019, the leading natural cause of death was cancer (35%, 71), followed by diseases of the nervous system (15%, 30), and congenital conditions (14%, 28). Mortality rates for most natural causes among children decreased over the 2005-2019 period, with some minor fluctuations by year.

**Figure 22. Natural causes child mortality rate (aged 1-17 years) by causes of death, NSW 2018-2019**



More details about the top five leading causes of death among infants and children over the period 2005-2019 by demographic information is included in Appendix 5.

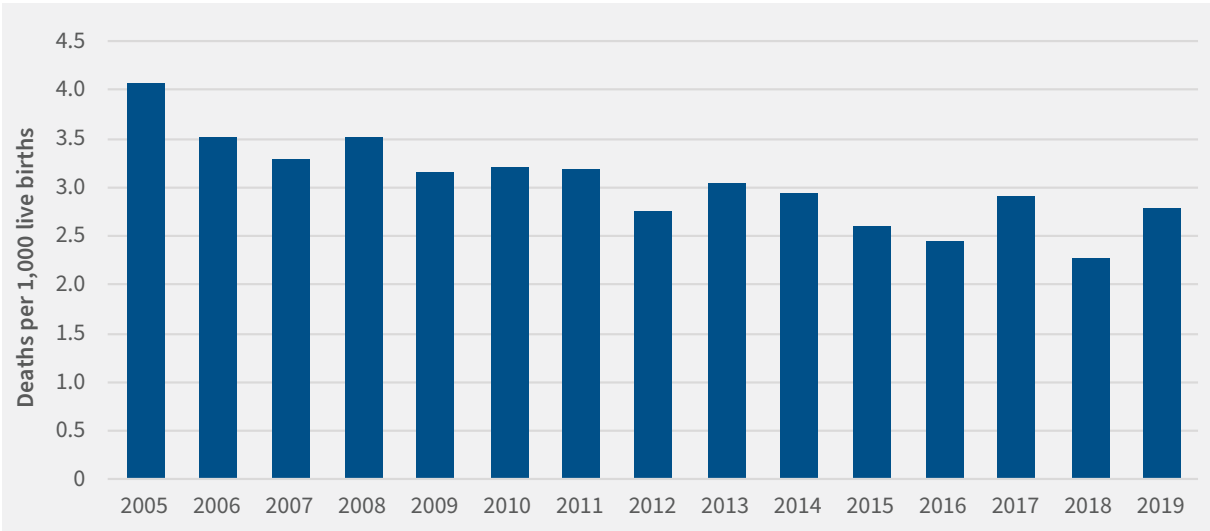
**3.2. Trends in natural cause infant and child deaths, 2005-2019**

Over the 15 years to 2019, infants and children who died from natural causes represented 75% (6,203) of the 8,302 children who died in NSW. Natural cause deaths accounted for most of the deaths of infants aged less than one year, and over half of the deaths of children aged 1-17 years over the period.

### 3.2.1. Trends in natural cause deaths by year

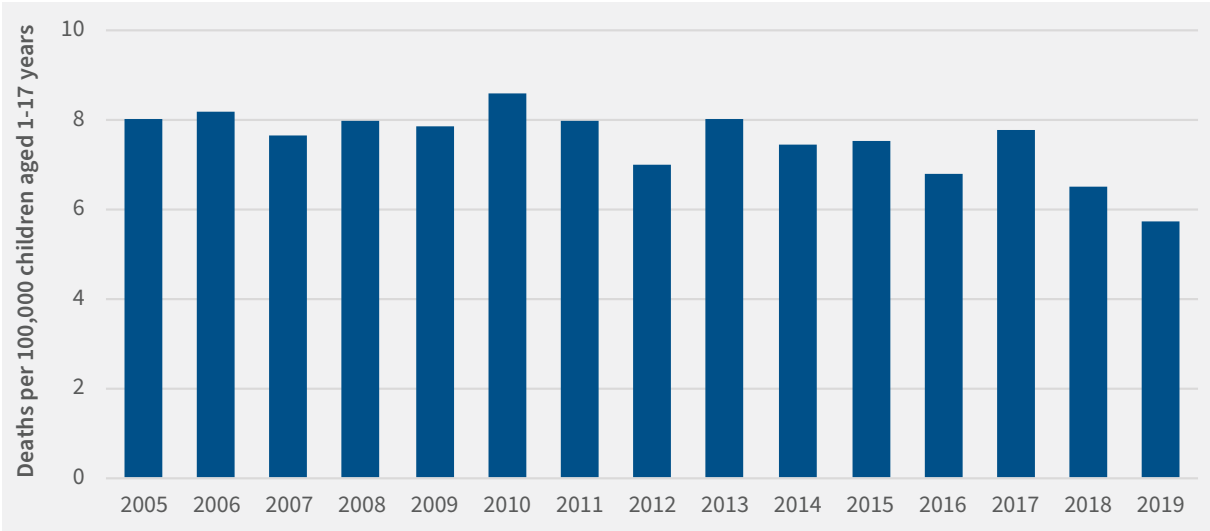
Between 2005-2019, there was a significant decrease in natural cause deaths among infants aged less than one year, from 4.1 deaths per 1,000 live births in 2005 to 2.8 deaths per 1,000 live births in 2019.

Figure 23. Natural cause infant mortality rate by year, NSW 2005-2019



There was also a significant decrease in natural cause deaths among children aged 1-17 years, from 8.0 deaths per 100,000 children in 2005 to 5.7 deaths per 100,000 children in 2019.

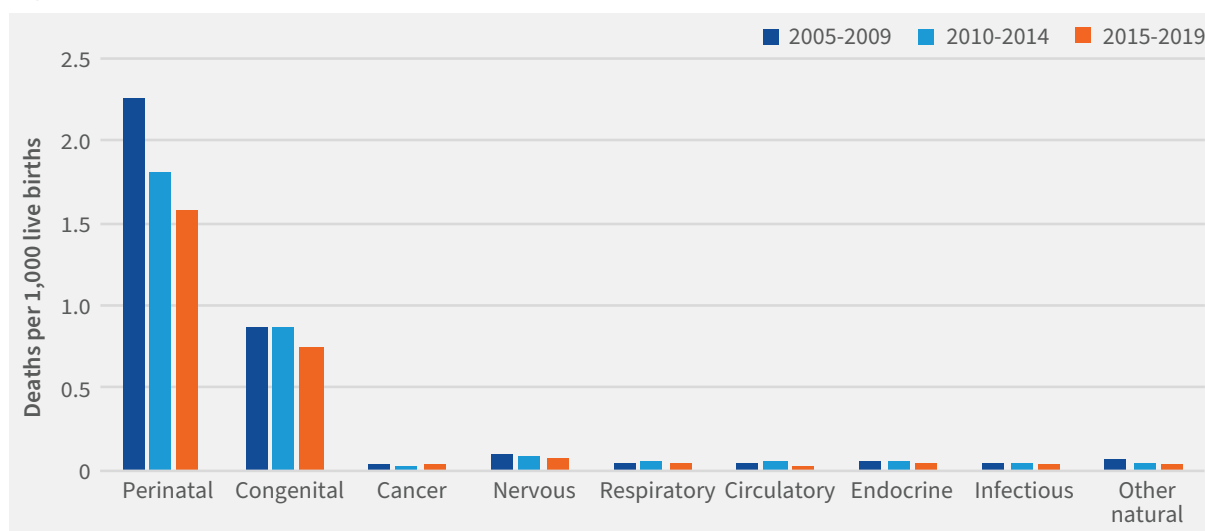
Figure 24. Natural cause child mortality rate (aged 1-17 years) by year, NSW 2005-2019



### 3.2.2. Trends in natural causes of death by cause of death

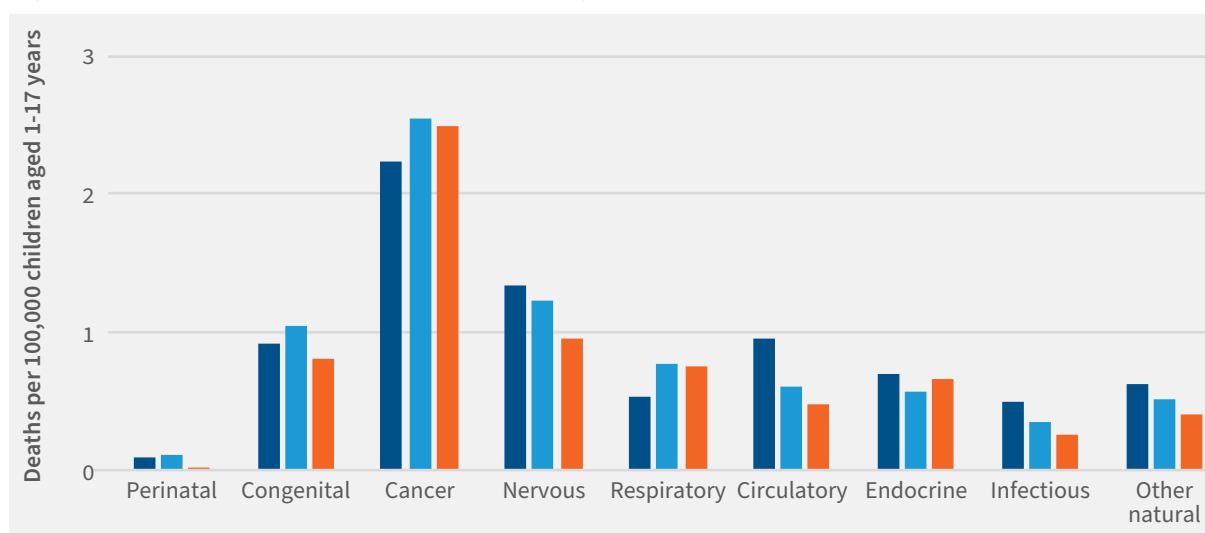
Over the 15-years to 2019, the mortality rate for perinatal conditions decreased significantly. No other natural cause of death significantly decreased among infants over this 15-year period, and the decline in the mortality rate for perinatal conditions accounts for almost all the decline in the overall infant mortality rate over the 15 years.

**Figure 25. Natural cause infant mortality rate by cause of death, NSW 2005-2019**



For children aged 1-17 years, cancers and tumours accounted for one-third of natural cause deaths in the 15 years 2005-2019, followed by nervous system diseases and congenital conditions.

**Figure 26. Natural cause child mortality rate (aged 1-17 years) by cause of death, NSW 2005-2019**



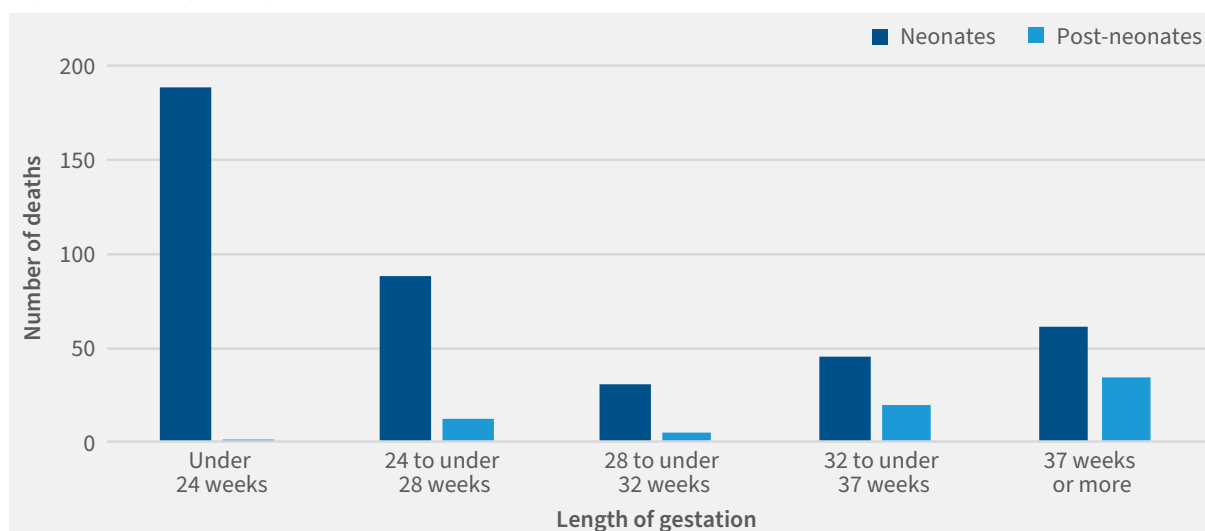
### 3.3. Factors identified for natural cause infant and child deaths, 2018-2019

#### 3.3.1. Premature birth

The majority (83%, 428) of infants who died from natural causes in 2018 and 2019 died in the neonatal period (i.e., aged less than 29 days). Most (82%, 352) neonates who died were born prematurely, at less than 37 weeks of gestation. Over one-third were born extremely premature, at under 24 weeks of gestation, and over 90% of these infants lived for less than a day.

Forty-two infants (8%) who died were identified as a twin from a multiple birth. Three-quarters of these infants were born prematurely before 28 weeks gestation. Over half of these twins lived for less than a day.

Figure 27. Length of gestation of infants who died from natural causes, NSW 2018-2019



### 3.3.2. Maternal factors and complications in pregnancy

Among the 155 neonatal deaths where maternal factors were identified as the cause of death, over half (55%, 86) were related to maternal complications of pregnancy, which included premature rupture of membranes, newborn affected by incompetent cervix, and two maternal deaths. A further 60 (39%) of the neonatal infant deaths in 2018-2019 were related to complications of the placenta, cord, and membranes, including deaths related to chorioamnionitis and placental separation and haemorrhage.

### 3.3.3. Congenital and chromosomal abnormalities

More than one-quarter (29%, 149) of the infants who died from natural causes died because of congenital or chromosomal abnormality. Three-quarters (114) of these infants died in the neonatal period, mostly in the first week of life. Over a third (53) of the infants had congenital malformations of the circulatory system. Other conditions included congenital malformations of the nervous system, and chromosomal abnormalities.

A smaller proportion (14%, 28) of the 204 children aged 1-17 years who died from natural causes had a congenital or chromosomal abnormality that contributed to their death.

### 3.3.4. Vaccine-preventable diseases

Infectious diseases are caused by pathogenic organisms including bacteria, viruses, and parasites. They are transmitted from person to person through direct or indirect contact.

Immunisation has successfully reduced the number of child deaths from infectious diseases. The current National Immunisation Program (NIP) Schedule<sup>15</sup> – updated 1 July 2020 – provides funded vaccination to protect against 16 infectious diseases for eligible children.

In 2016, the CDRT published a report on child deaths from vaccine-preventable infectious diseases.<sup>16</sup> Deaths from diseases of interest over a ten-year period (2005-2014) were reviewed to determine whether they were potentially vaccine preventable, and then further classified according to whether the death was considered preventable through vaccination. A disease of interest was defined as a disease for which a vaccine is currently available on the National Immunisation Program (Table 5). Human papillomavirus was not included because this causes diseases in adulthood. The study resulted

15. Australian Government Department of Health 2021. National Immunisation Program Schedule. Accessed from <https://www.health.gov.au/health-topics/immunisation/immunisation-throughout-life/national-immunisation-program-schedule> on 29 March 2021.

16. NSW Child Death Review Team 2016. Child deaths from vaccine preventable infectious diseases, NSW 2005-2014, prepared by the National Centre for Immunisation Research and Surveillance. NSW Ombudsman, Sydney.

in several recommendations to improve prevention of child deaths due to vaccine-preventable diseases, including strategies to enhance data collections for future review and analysis. We have since implemented a process to exchange information about diseases of interest with NSW Health each year.

We identified deaths in the Register of Child Deaths associated with diseases of interest based on ICD-10 coding for underlying cause of death.

**Table 5. Diseases of interest**

Diphtheria	Meningococcal disease	Rotavirus
Haemophilus influenzae	Mumps	Rubella
Hepatitis A and B	Pertussis	Tetanus
Influenza	Pneumococcal disease	Varicella
Measles	Poliomyelitis	

A death was considered vaccine-preventable according to the framework below (Table 6). Vaccines protect against specific sub-types of a disease. For example, funded vaccines against meningococcal disease in Australia on the NIP from 2003 to June 2018 were available for subtype C and administered to children at 12 months of age. However, from July 2018 children became eligible to receive a meningococcal vaccine that protects against subtypes A, C W and Y.

**Table 6. Classification for vaccine-preventable death**

<b>Preventable</b>	Vaccine available and child eligible under the National Immunisation Program (NIP)
<b>Potentially preventable</b>	Vaccine available, however child not eligible under NIP Insufficient information about disease sub-type to determine if it was in an available vaccine
<b>Not preventable</b>	Vaccine not available Child too young to be immunised Medical contraindication to immunisation Fully immunised but ineffective immune response

Over the 10 years to 2019, there have been 63 deaths of infants and children associated with a disease of interest in NSW. The most common disease of interest (34 of 63) that resulted in the death of an infant or child over the 10-year period was pneumococcal disease, followed by influenza (21). Of the 63 deaths, just under half (29) were classified as potentially preventable.

**Vaccine-preventable deaths in 2018-2019**

In the two-years, we identified 12 children aged 0-17 years who died from causes associated with a disease of interest. However, only three of the 12 deaths were considered potentially preventable according to the classification framework. Two children died from meningococcal septicaemia, and one from influenza. In each of these cases the child was either ineligible under the NIP<sup>17</sup> or information was missing about the disease sub-type.

17. The NIP schedule lists all vaccines available. Certain vaccines are free through the NIP for children aged 4 years old or under. Aboriginal and Torres Strait Islander children and children with certain medical risk conditions that increase risk of disease can get additional free vaccines through the NIP. All children aged 5-17 years should receive any missed routine childhood vaccinations. Children aged 10-15 are also eligible for specific booster doses, and certain other vaccines (HPV and Meningococcal). See <https://www.health.gov.au/health-topics/immunisation/immunisation-throughout-life/immunisation-for-children> for further information, accessed 19 May 2021.

## 3.4. Infants and children in care, 2018-2019

Twelve infants and children aged 0-17 years who died from natural causes resided in care. The children died from causes including cancers and tumours, nervous system conditions, congenital and chromosomal malformations, and respiratory conditions. Six of these children were of Aboriginal and/or Torres Strait Islander background.

## 3.5. Observations

### 3.5.1. Natural cause mortality rates are declining

Internationally, in high income countries similar to Australia, child mortality has decreased substantially over time and natural causes including perinatal, congenital and other medical conditions account for the majority of deaths.<sup>18</sup> This chapter has highlighted that there have been significant declines in natural cause deaths for both infants and children in NSW over the 15 years 2005-2019, which appears to be similar to decreases in child mortality around Australia.<sup>19</sup> These declines in child mortality in NSW were mostly driven by a significant decrease in perinatal conditions among infants over the period. The highest risk of infant mortality was found among infants born prematurely, particularly those born less than 24 weeks gestational age. This observation is consistent with previous Australian research.<sup>20</sup>

### 3.5.2. Potentially preventable natural deaths among young children require further investigation

Better understanding risk factors associated with early childhood mortality and premature birth (such as antenatal care, birth circumstances and conditions) and the relationship between these factors and variations in mortality observed according to characteristics such as socio-economic status, is an important element to developing preventative strategies.<sup>21 22</sup>

To improve our knowledge of early childhood mortality and how best to target our prevention efforts, the CDRT is currently undertaking research in partnership with the Australian Institute of Health and Welfare. The project is using linked data of all children born in NSW with those who died between 2005-2019.<sup>23</sup> This approach provides an opportunity for in-depth analysis of the underlying factors around birth, including the role of maternal health and antenatal care and other variables on infant and early childhood mortality. The findings of this study will help inform enhanced prevention and early intervention activities in NSW.

The research will consider including a focus on Aboriginal and Torres Strait Islander mothers and children to better inform culturally appropriate prevention strategies.<sup>24</sup> The study findings will be prepared as a special report for Parliament, and any recommendations will be overseen by the CDRT.

18. Fraser J, Sidebotham P, Frederick J et al 2014. Learning from child death review in the USA, England, Australia and New Zealand. *Lancet*, 384, 894-903.

19. Australian Institute of Health and Welfare 2020. Australia's children. Cat. No. CWS 69. Australian Institute of Health and Welfare, Canberra.

20. Stephens AS, Lain SJ, Roberts CL et al 2016. Association of gestational age and severe neonatal morbidity with mortality in early childhood. *Paediatric and Perinatal Epidemiology*, 30, 583-93.

21. Mohsin M, Bauman A, Jalaludin B 2006. The influence of antenatal and maternal factors on stillbirths and neonatal deaths in New South Wales, Australia. *Journal of Biosocial Sciences*, 38, 643-57.

22. NSW Health Centre for Epidemiology and Evidence 2018. New South Wales Mothers and Babies 2017. NSW Health, Sydney.

23. NSW Child Death Review Team 2020. NSW Child Death Review Team Annual Report 2019-20. NSW Ombudsman, Sydney.

24. Australian Institute of Health and Welfare 2020. Antenatal care use and outcomes for Aboriginal and Torres Strait Islander mothers and their babies 2016-2017. Cat. No. IHW 237. Australian Institute of Health and Welfare, Canberra.



## 4. Sudden Unexpected Death in Infancy

In 2018 and 2019, the deaths of 80 infants were classified as Sudden Unexpected Death in Infancy (SUDI). These deaths represent 13% of all infant deaths in this period.

Although SUDI has significantly declined over the past 15 years, there has been no change over the last 5 years.

More than half (57%) of infants who died suddenly and unexpectedly were less than three months of age.

Most infants were exposed to at least one avoidable risk, including tobacco smoke and objects that posed a risk of suffocation.

Infants from families with a child protection history, and those who lived in the most disadvantaged areas of NSW are over-represented in SUDI deaths. Targeted interventions by agencies need to focus on infants from disadvantaged and vulnerable families.

The proportion of SUDI where cause of death was able to be identified has improved over time, particularly in the last five years, which has shown a marked improvement.

### 4.1. SUDI overview

This chapter examines the deaths of 80 infants whose deaths were classified as Sudden Unexpected Death in Infancy (SUDI) in 2018 and 2019.

The term SUDI applies to the death of an infant (i.e., aged less than 12 months) that is sudden and unexpected, where the cause was not immediately apparent at the time of death. Excluded from this definition are infants who died unexpectedly as a result of injury – for example, transport fatalities – and deaths that occurred as a result of a known acute illness in a previously healthy infant.

SUDI is a classification, rather than a cause of death. Following investigation, an underlying cause of death is sometimes identified. These ‘explained’ SUDI include sudden and unexpected infant deaths that are subsequently found to be due to diseases or morbid conditions that were not identified as life threatening before death, accidental threats to breathing, and other external causes including deaths that occur in suspicious circumstances.

In other SUDI cases, investigation is not able to determine cause of death; these ‘unexplained’ SUDI include deaths classified as Sudden Infant Death Syndrome (SIDS). SIDS is defined as the sudden unexpected death of an infant less than one year of age, with onset of the fatal episode apparently occurring during sleep, which remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history.

The CDRT has undertaken considerable work over several years to prevent sudden and unexpected infant deaths. This work has focused on:

- gathering information about factors associated with, or that may contribute to, SUDI through consistent classification and data analysis to inform and support efforts to address modifiable risks.
- identifying the demographic characteristics of families most likely to experience SUDI and working with agencies – such as NSW Health and the Department of Communities and Justice – to promote strategies that target support to those most in need.
- raising awareness among agencies responsible for responding to SUDI – the police, ambulance, and health (emergency departments and forensic services) and the Coroner’s office – of the importance of a timely, expert-led, and comprehensive investigation to increase the likelihood that a cause of death can be determined. Understanding why an infant died is crucial to prevention efforts, as well as for parents and carers to understand their loss.

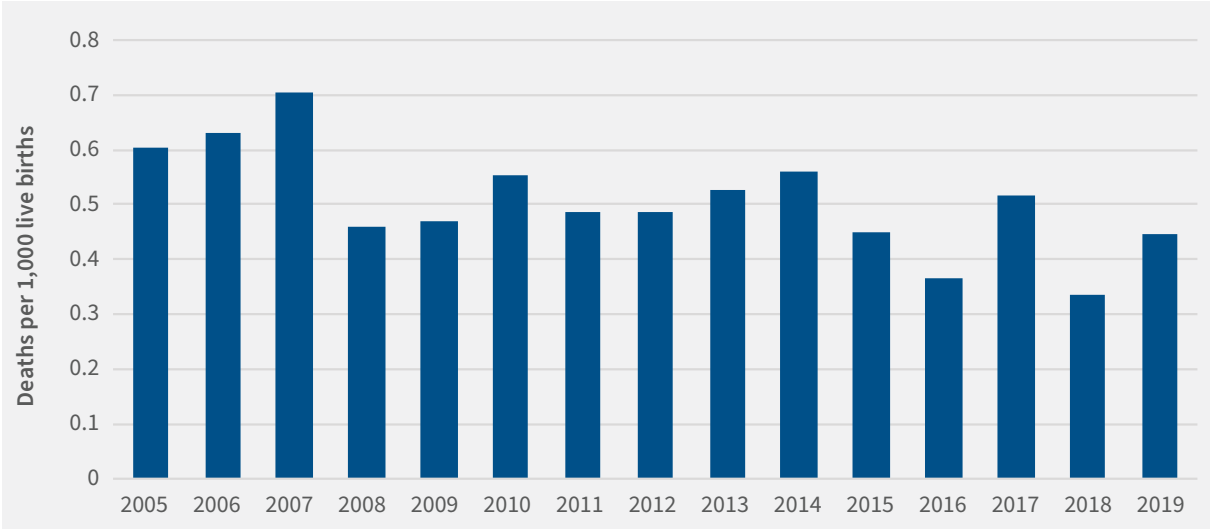
The CDRT’s work is discussed in more detail later in this chapter.

## 4.2. SUDI in 2018-2019, and trends

In the two-year period, the deaths of 80 infants – 13% of all infants who died – were classified as SUDI. The 80 deaths reflected an infant mortality rate (IMR) of 0.39 deaths per 1,000 live births in NSW. The proportion of all infant deaths that are classified as SUDI has remained relatively stable over time – approximately 14% of infant deaths in NSW over 2005-2019.

In 2018 and 2019, three SUDI were reviewable by the Ombudsman, including one infant in care and two infants who died in suspicious circumstances.

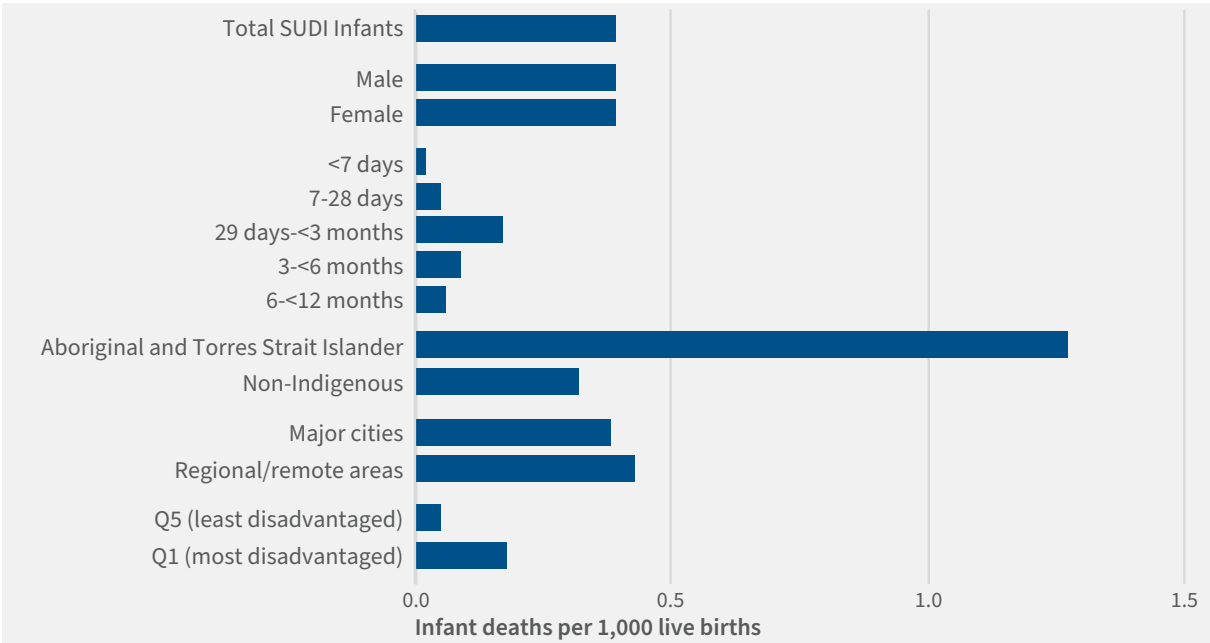
Figure 28. SUDI infant mortality rate by year, NSW 2005-2019



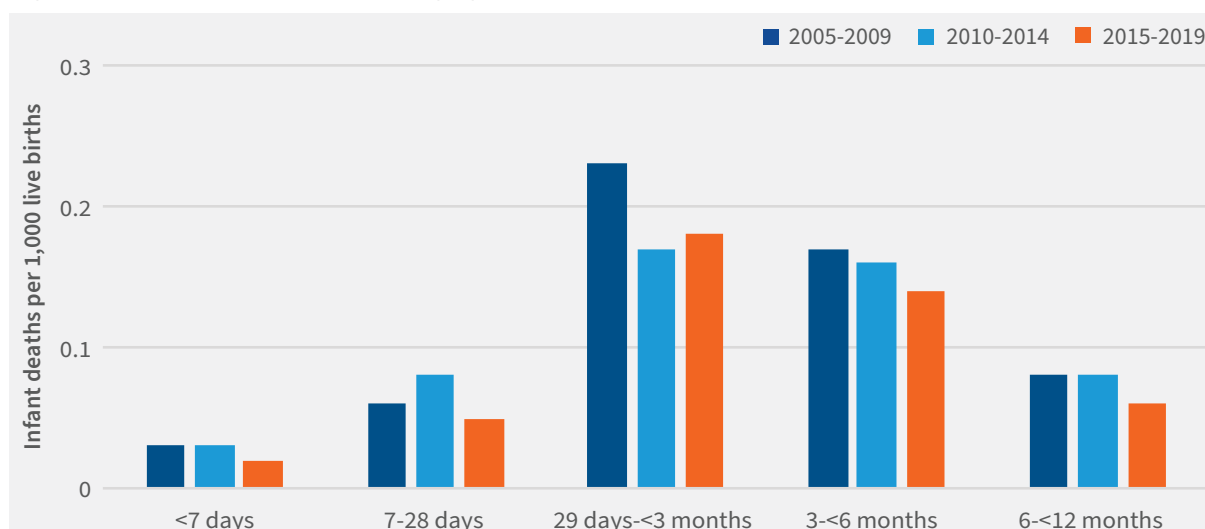
### 4.2.1. SUDI by demographics

In 2018 and 2019, over half (61%, 49) of the 80 infants who died suddenly and unexpectedly were aged three months or less. This pattern has been consistent over time – in the 15 years to 2019, 57% of SUDI infants were aged three months or less.

Figure 29. SUDI mortality rate by demographics, NSW 2018-2019



**Figure 30. SUDI mortality rate by age group, NSW 2005-2019**



Infants living in the most disadvantaged areas of NSW, families known to child protection services, and Aboriginal and Torres Strait Islander families are over-represented in SUDI. In 2018 and 2019:

- nearly half (48%, 38) of the families lived in the most socio-economically disadvantaged areas in NSW.
- almost half (45%, 36) of the infants were from families known to child protection services. In most cases (29 of the 36 families), the report made was screened as meeting the ROSH threshold. The other seven families were the subject of a non-ROSH (6) or CWU report (1).
- nearly one-quarter (24%, 19) of the families were Aboriginal or Torres Strait Islander.

The over-representation of certain families in SUDI has been consistent over time. For example, over the 15 years to 2019, the SUDI mortality rate for infants living in the most socio-economically disadvantaged areas of the state was 5.8 times higher than those residing in the least disadvantaged areas. Similarly, infants from families known to child protection services have accounted for almost half (46%) of deaths classified as SUDI over the 2005-2019 period, compared to 13% of infant deaths that were not classified as SUDI (i.e., infants whose deaths were classified as SUDI were 3.5 times more likely to come from a family known to child protection services).

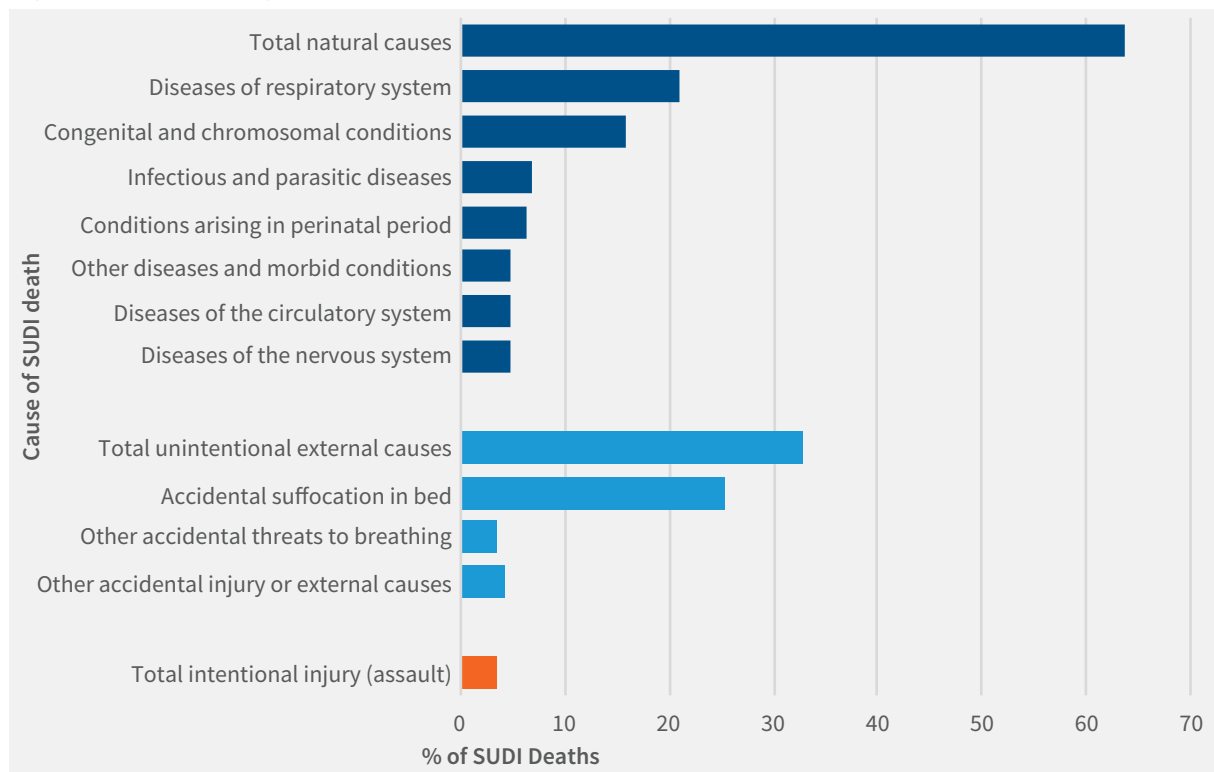
#### 4.2.2. SUDI by cause of death

SUDI are determined to be either explained or unexplained following investigation. Explained SUDI include:

- deaths due to disease or morbid conditions that were not identified as life threatening before death
- threats to breathing, such as accidental suffocation in an unsafe sleeping environment, and
- other external causes, including deaths that occur in suspicious circumstances.

Over the 15 years to 2019, approximately two-thirds (65%) of SUDI remained unexplained after investigation, with no cause of death able to be identified. Most of the matters where a cause of death was determined were found to be the result of natural causes that had not previously been identified or were not recognised as life threatening before death. The remaining explained SUDI were due to external injury-related causes – primarily accidental threats to breathing in the context of an unsafe sleeping environment.

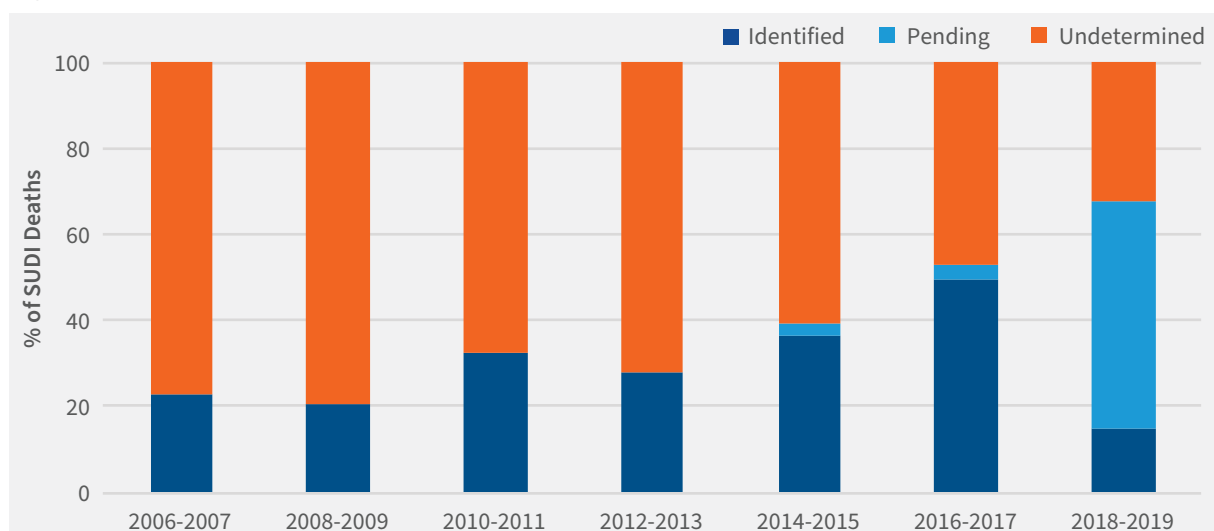
**Figure 31. Underlying cause of death for explained SUDI, NSW 2005-2019**



At the time of writing, the Coroner had finalised investigations into 38 of the 80 SUDI deaths in 2018 and 2019. Among the finalised matters, a cause of death was identified following autopsy for 12 infants; nine were found to have died from natural causes, and three from accidental suffocation in the context of an unsafe sleep environment. A cause of death was unable to be determined by the Coroner in the other 26 finalised cases. Investigations into cause of death for the remaining 42 SUDI were still in progress at the time this report was prepared.

As shown in the figure below, the proportion of SUDI where a cause of death can be identified has improved over time. Over the last five years in particular there has been a marked increase in the proportion of explained SUDI. Prior to 2014, a cause of death was only able to be determined in approximately one-quarter (26%) of SUDI. In 2014-2015, the proportion of explained SUDI rose to 37%, and in 2016-2017 a cause of death was able to be determined in nearly half (49%) of all deaths classified as SUDI. The percentage of explained SUDI appears likely to increase further once investigations into the most recent deaths have been finalised.

**Figure 32. Proportion of SUDI with identified cause of death by two-year period, NSW 2006-2019**



### 4.3. Factors associated with SUDI deaths, 2018-2019

Research has consistently identified certain factors associated with SUDI. These factors include both intrinsic and extrinsic factors.

Intrinsic factors involve individual characteristics that affect an infant’s susceptibility,<sup>25</sup> including:

- Low birth weight (less than 2500g)
- Preterm birth (less than 37 weeks gestation)
- Small for gestational age (less than 10th percentile at birth) or small for age
- Preceding infection (within two weeks of death)
- Prenatal exposure to drugs, particularly nicotine (from cigarettes) and alcohol.

Intrinsic factors are generally not modifiable, except for exposure to maternal cigarette smoking (or other drug and alcohol consumption) during pregnancy. Duncan and Byard<sup>26</sup> note that in the wake of reductions in prone sleeping, exposure to maternal smoking during pregnancy is now considered the dominant modifiable factor for SIDS – although the exact mechanism of how this increases risk is still to be fully explained.

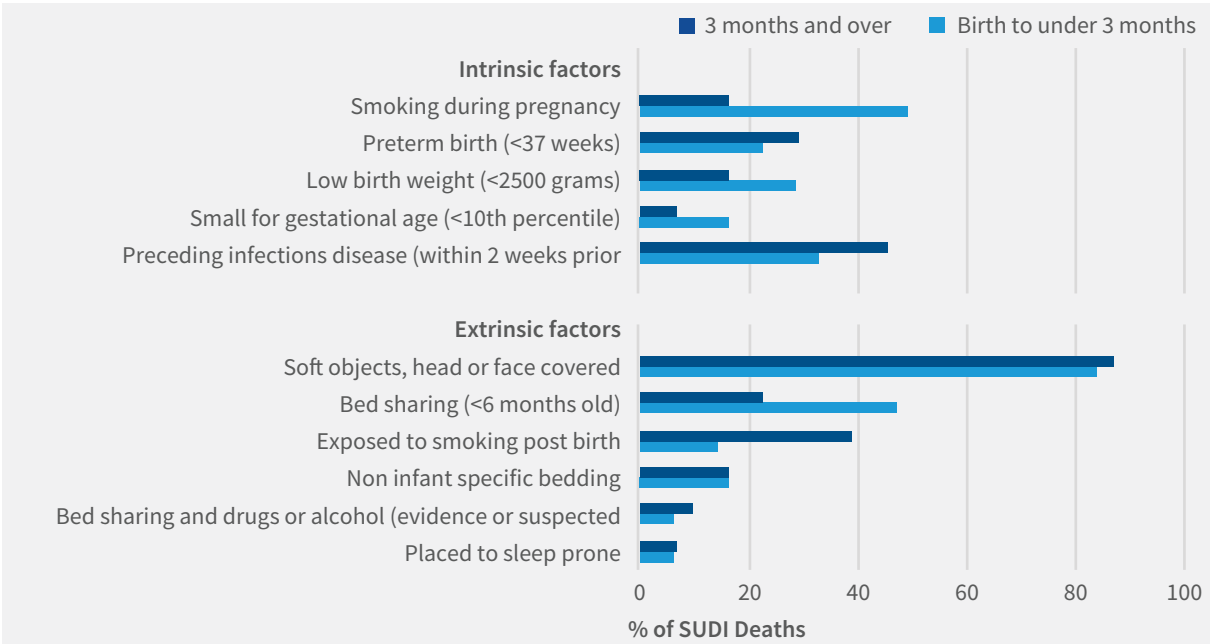
There are also well evidenced extrinsic (environmental) factors for SUDI, including:

- Sleep position – especially prone position (placing an infant to sleep on their front) and side sleeping
- Sharing a sleep surface – particularly for very young infants
- Bedding that is not designed for infants and/or for sleeping – such as a sofa
- Post-birth exposure to smoking
- Over-bundling/over-heating – excess bedding and clothing
- Loose soft items in an infant’s sleep environment that pose a suffocation risk.

Extrinsic risks are factors that can be modified in the infant’s environment. Internationally, researchers have noted at least one factor (and sometimes more) is present in approximately 90% of all SIDS cases, with very few cases reported where no extrinsic factors are present.<sup>27</sup>

The figure below presents the key intrinsic and extrinsic factors identified among SUDI in NSW 2018 and 2019.

Figure 33. Key reported factors identified for SUDI by age group, NSW 2018-2019



25. Duncan JR and Byard RW 2018. Sudden Infant Death Syndrome: an overview in Duncan JR, Byard RW (editors). Sudden infant and early childhood death: The past, the present and the future. University of Adelaide Press, Adelaide.  
 26. Duncan JR, Byard RW (editors) 2018. Sudden infant and early childhood death: The past, the present and the future. University of Adelaide Press, Adelaide.  
 27. Duncan JR, Byard RW (editors) 2018. Sudden infant and early childhood death: The past, the present and the future. University of Adelaide Press, Adelaide.

### 4.3.1. Intrinsic factors

Among SUDI in 2018 and 2019, our reviews found evidence of at least one intrinsic factor for nearly three-quarters (71%, 57) of the 80 infants who died suddenly and unexpectedly, including:

- Preceding infectious disease (30)
- Smoking during pregnancy (29)
- Preterm birth (20)
- Low birth weight (19)
- Small for gestational age (10).

Two of these factors are discussed in more detail below.

#### Preceding infectious disease

Our work has often noted that stressors – such as infection, fever, and minor respiratory and gastro-intestinal illnesses – commonly occur in the days to weeks preceding the sudden unexpected death of an infant, and that minor infections have been associated with an increased likelihood of SIDS when combined with head covering or prone sleeping.

In 2018 and 2019, more than one-third (30) of the 80 infants whose deaths were classified as SUDI were identified as having been exposed to, or experienced, infectious disease at some point in the two weeks prior to their death. Evidence of preceding infection for these 30 infants included detection of a virus in autopsy swabs, and post-mortem findings of severe infections that were not recognised as life threatening prior to death. Of the 30 infants:

- Three died from natural causes. In two cases, the cause was an infectious disease that was directly related to the infant's cause of death. The third infant's death was not related to the preceding infection.
- One infant accidentally suffocated after the parent fell asleep while feeding in bed
- A cause of death was not able to be determined for eight infants
- At the time of writing, investigations were still underway into the cause of death for 18 infants.

All three of the infants found to have died from natural causes showed signs of illness in the two weeks before their death (including coughing, vomiting, diarrhoea, and fever); and all were seen by a health professional in the two-week period – including general practitioners (GP's) and hospital emergency departments. None of the infants were identified as having a serious illness at the time of presentation.

#### Smoking during pregnancy

In 2018 and 2019, more than one-third (36%, 29) of mothers of infants who died suddenly and unexpectedly smoked tobacco during pregnancy. By comparison, the NSW Perinatal Data collection shows that only 8.8% of women who gave birth in NSW smoked during pregnancy in 2019.<sup>28</sup> Although prenatal smoking can be modified, it is not modifiable once the child is born and becomes an intrinsic vulnerability.

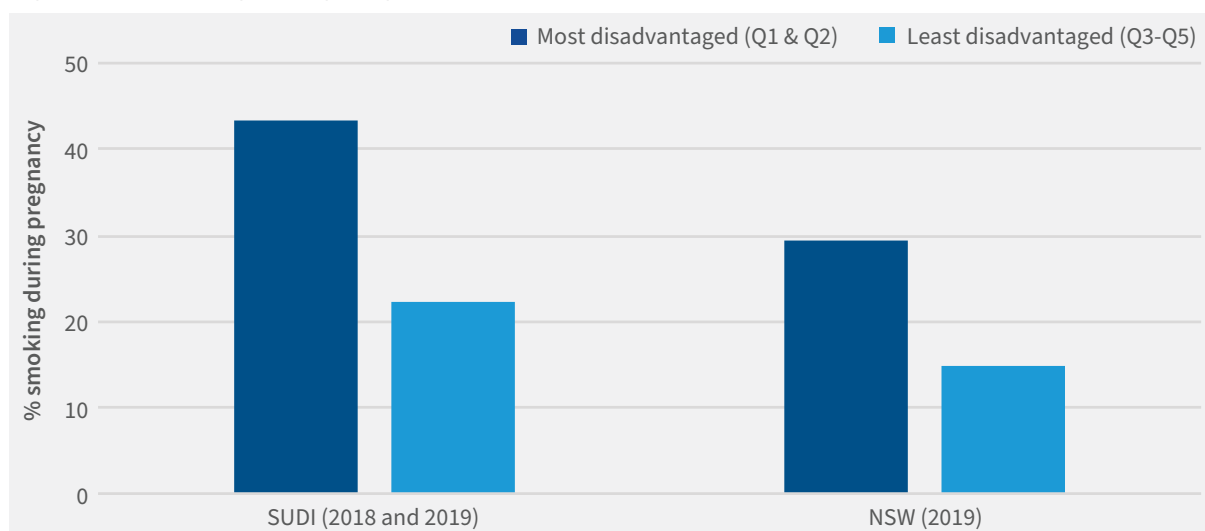
There is a significant association between socio-economic status and smoking during pregnancy (Figure 34). In NSW, 2019 health data shows that 30% of mothers from the most disadvantaged areas (Quintiles 1 and 2) reported smoking during pregnancy, compared with 15% of mothers from the least disadvantaged areas (Quintiles 3-5).<sup>29</sup>

In relation to SUDI in 2018-2019, nearly half (43%) the mothers living in the most disadvantaged areas (Quintiles 1 and 2) smoked during pregnancy, compared with 22% of mothers from the least disadvantaged areas (Quintiles 3-5).

28. NSW Health 2021. Health Stats: Smoking in pregnancy. Accessed from [http://www.healthstats.nsw.gov.au/Indicator/mab\\_smo\\_cat/mab\\_smo\\_cat](http://www.healthstats.nsw.gov.au/Indicator/mab_smo_cat/mab_smo_cat) on 1 March 2021.

29. NSW Health 2021. Health Stats: Smoking in pregnancy. Accessed from [http://www.healthstats.nsw.gov.au/Indicator/mab\\_smo\\_cat/mab\\_smo\\_cat\\_ses\\_snap](http://www.healthstats.nsw.gov.au/Indicator/mab_smo_cat/mab_smo_cat_ses_snap) on 1 March 2021. We note in sourcing 2019 from NSW Health, they have reversed Q1 and Q5 incorrectly to AIHW, listing Q1 as least disadvantaged when it should be most disadvantaged.

Figure 34. Smoking during pregnancy by socio-economic status, SUDI 2018-2019 vs NSW 2019



NSW Health's Tobacco Strategy Work Plan identifies pregnant women who smoke as a priority target population and addressing smoking in pregnancy is a system wide priority for NSW Health.<sup>30</sup> Local Health Districts (as the lead) are to ensure that all pregnant women who smoke are offered high quality and culturally appropriate cessation supports as part of routine care throughout their pregnancy to encourage smokers to quit and stay quit.

### 4.3.2. Extrinsic factors

In 2018 and 2019, most infants whose deaths were classified as SUDI (72) were exposed to at least one modifiable factor and generally to multiple factors – regardless of cause of death. The most frequently identified extrinsic factors were:

- Suffocation risks – e.g., loose pillows, bedding, and other soft objects in the sleep environment
- Bed-sharing <6 months old
- Exposure to tobacco smoke after birth
- Bedding not designed for infants.

#### Suffocation risk

As noted above, at the time of writing the Coroner had finalised investigations into 38 of the 80 deaths classified as SUDI in 2018 and 2019. Of the finalised matters, three infants were found to have died from accidental asphyxia. In two cases, the infants were placed in environments with loose bedding or other soft objects which posed a suffocation risk. The third asphyxia death occurred in the context of unintentional bed sharing.

Our reviews identified the presence of suffocation risks in the majority of SUDI (64 of 80). As noted above, among the finalised matters, suffocation risks were directly connected to the infant's cause of death in three cases. Among infants where a cause of death was not able to be determined with certainty, it is unclear if or to what extent loose bedding, or other soft objects such as pillows and soft toys in the infant's sleep environment contributed to the infant's sudden and unexpected death. Regardless, eliminating threats to breathing when placing an infant for sleep – particularly for very young infants – can be achieved by adhering to safe sleeping advice recommended by NSW Health and organisations such as Red Nose.<sup>31</sup>

30. NSW Health Tobacco Strategy Work Plan 2019-2021, which supports the implementation of the NSW Tobacco Strategy 2012-2021. Accessed from <https://www.health.nsw.gov.au/tobacco/Pages/tobacco-strategy.aspx> on 29 April 2021. The Work Plan is due to be reviewed in July 2022.

31. Red Nose Australia 2021. Safe sleeping. Accessed from <https://rednose.org.au/section/safe-sleeping> on 23 March 2021.



## Bed-sharing <6 months old

Most of the infants (66 of 80) were placed for sleep prior to being located unresponsive. Of the 66, more than half (36) were sharing a sleep surface – generally an adult bed or mattress – with one or more carers and sometimes with other children as well. Almost all (30) of the infants sharing a sleep surface were less than six months old, and most (23) were less than three months. Our reviews identified that six infants were sharing a bed with an adult affected by alcohol, drugs, or sedating medication, and all but one of these infants was less than six months of age. In one case, the infant died as a result of asphyxia. A cause of death was unable to be determined for four of the infants, and a cause of death was pending for one infant.

## Exposure to tobacco smoke

Almost two-thirds (60%, 48) of the 80 infants were exposed to tobacco smoke after birth. In just over half of these families (29), the mother also smoked during pregnancy. In comparison, NSW Health data shows that in 2019, only 11% of adults (12% of males and 10% of females) in NSW were current daily tobacco smokers.<sup>32</sup>

The high proportion of SUDI exposed to tobacco smoke has been a consistent observation over time. In the five years 2013-2017, more than two thirds (71%) of all SUDI involved infants who had been exposed to tobacco smoke.<sup>33</sup>

## Bedding not designed for infants

Among the 30 infants who were placed alone in a sleep environment, nine were placed on bedding not designed for infants (adult beds or mattresses). A further three infants were placed in prams. Red Nose recommends parents maintain regular supervision of infants sleeping in prams or strollers, and to avoid unobserved sleep as prams are ‘transport device’ products not designed as infant-specific bedding.<sup>34</sup> The presence of loose bedding or soft items in the infant’s sleep environment was noted in most of the cases where infants were placed alone in non-infant specific bedding.

Fourteen of the 80 infants were not placed for sleep at the time of the fatal incident. Most (9) of these infants died in the context of unintentional bed-sharing because the parent/carers fell asleep while feeding or settling the infant. The cause of death for seven of the infants was undetermined, and a cause of death was pending for two infants.

The other infants not placed for sleep were generally placed on soft surfaces on the floor, sometimes prone, without active supervision.

## 4.4. Agency responses to SUDI

The CDRT has repeatedly identified gaps in SUDI investigation and has made a number of recommendations to improve agency approaches to SUDI in NSW. The interagency response is important because it aims to:

- establish, as far as possible, the cause or causes of the infant’s death
- identify any potential contributory or modifiable factors
- provide ongoing support to the family
- ensure that all statutory obligations are met, and
- learn lessons to reduce the risks of future infant deaths.

An effective SUDI response requires close work by health, police, coronial and forensic professionals. In 2017, a cross-agency working group was established by the Department of Premier and Cabinet in response to previous CDRT recommendations.<sup>35</sup> The group, now led by NSW Health, was tasked with achieving a more coordinated cross-agency response to SUDI.

32. NSW Health 2021. Health Stats: Smoking in pregnancy. Accessed from [http://www.healthstats.nsw.gov.au/Indicator/beh\\_smo\\_age](http://www.healthstats.nsw.gov.au/Indicator/beh_smo_age) on 1 March 2021.

33. NSW Ombudsman 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017, incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

34. Red Nose Australia 2021. Baby safe sleeping products. Accessed from <https://rednose.org.au/article/baby-safe-sleeping-products> on 23 March 2021.

35. NSW Child Death Review Team 2016. Child Death Review Report 2015. NSW Ombudsman, Sydney.



In July 2019, NSW Health published a revised policy directive, *Management of Sudden Unexpected Death in Infancy (SUDI)*.<sup>36</sup> Health's SUDI policy is the most comprehensive resource available in relation to cross-agency responses to SUDI. The new policy outlines the mandatory requirements for management of SUDI in NSW Health facilities. It also outlines the role of other agencies with a role in responding to SUDI including NSW Ambulance, NSW Coroner and NSW Police Force.

The revised policy:

- emphasises the need to provide parents or carers with the support they need following a SUDI death, including medical and nursing care, social work, and referral to other services such as Red Nose Grief and Loss<sup>37</sup>
- stipulates the Hospital to which an infant is taken is to accept and manage all episodes of SUDI whether they occur in the hospital or the community
- emphasises that all NSW Health facilities are expected to respond to SUDI, and
- emphasises the use of a revised SUDI medical history protocol.

In November 2019, the NSW State Coroner published findings of an inquest into the deaths of two infants who died suddenly and unexpectedly.<sup>38</sup> As part of this inquest, Magistrate O'Sullivan considered issues arising in the investigation and management of SUDI in NSW, including the adoption of a joint agency approach to SUDI investigation, and the need for a centralised contact point for SUDI investigations in NSW – matters previously raised by the CDRT. The inquest was assisted by an expert conclave which included current CDRT members with relevant expertise and took account of work undertaken by the SUDI cross-agency working group. A key purpose of the inquest was to identify practical improvements to policy and practice for the future.

The inquest resulted in numerous (13) recommendations – to NSW Ambulance, NSW Police Force, NSW Health Pathology, NSW Ministry of Health (including one joint recommendation with police), and the state government. The focus of these recommendations was primarily the adequacy of policy and procedures of the agencies in responding to SUDI and practical changes to improve the experience of families who experience SUDI. Of note, the State Coroner recommended that:

- NSW Ministry of Health implement their proposed audit of the revised SUDI medical history form over a period of 12 months and evaluate whether the form is being sufficiently completed and whether it is consistently being provided to NSW Health Pathology's Forensic Medicine service in a timely manner.
- NSW Police Force consider amending their Report of a Death to the Coroner form (P79A) and relevant procedures to include more comprehensive documentation about the sleeping environment of the deceased infant.
- NSW Health Pathology's Forensic Medicine service review its policies to ensure that Clinical Nurse Consultant roles ensure SUDI medical history information is provided to the forensic pathologist in a timely manner.
- The NSW Government consider creating the role of a paediatric clinical nurse consultant at the Coronial Case Management Unit trained in SUDI investigations to provide centralised support 24 hours a day to NSW agencies investigating SUDI and accidental child deaths in NSW.

At the time of writing, NSW Health and the state government (Department of Premier and Cabinet) had not yet provided a formal response to the State Coroner's recommendations.<sup>39</sup> NSW Police supported all recommendations, but noted complexities linked to the application of recommendations in practice.

36. Red Nose Australia 2021. Is a pram bassinet as safe for sleeping as a bedside bassinet; if not how long would it be safe for a baby to sleep in a pram bassinet? Accessed from <https://rednose.org.au/question/is-a-pram-bassinet-as-safe-for-night-sleeping-as-a-bedside-bassinet-if-not-how-long-would-it-be> on 22 February 2021.

37. Red Nose Grief and Loss provides specialised bereavement support to grieving individuals and families affected by the sudden and unexpected death of a baby or child during pregnancy, birth, infancy or childhood. See <https://rednose.org.au/page/grief-and-loss-support-services> accessed 19 May 2021.

38. Coroners Court NSW 2020. Inquest into the deaths of Kayla Ewin and Iziah O'Sullivan. Coroners Court NSW, Sydney. Accessed from [https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2019/Inquest\\_into\\_the\\_deaths\\_of\\_Kayla\\_Ewin\\_and\\_Iziah\\_OSullivan\\_Findings\\_Final.pdf](https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2019/Inquest_into_the_deaths_of_Kayla_Ewin_and_Iziah_OSullivan_Findings_Final.pdf) on 22 February 2021.

39. Government Responses to Coronial Recommendations, Communities and Justice Coronial recommendations. Accessed from <https://www.justice.nsw.gov.au/lsb/Pages/coronial-recommendations.aspx> on 13 April 2021.

For example, NSW Police observed that it may be impossible for police to secure answers to many of the questions required on the amended form at the time it is submitted to the Coroner, and as such note that police should not be criticised if some information is missing.

#### 4.4.1. Investigations of SUDI in 2018-2019

The CDRT have been monitoring gaps and deficiencies in the interagency response to SUDI for several years. Key gaps identified include a lack of detailed information about the death scene, missing or incomplete medical history forms, and issues with post-death forensic processes. Many of these gaps and deficiencies were considered in the 2019 Coronial inquest noted above.

Our reviews of SUDI in 2018 and 2019 continued to highlight issues with the interagency response during the two-year period. These issues included:

- Failure to triage to appointed hospital – while most (59 of 80) infants were transported to a hospital emergency department as required, just over one quarter (21) of the infants were taken directly to a morgue. The proportion of infants transported to an emergency department rather than a morgue has not improved in the 2018-2019 period compared to 2016-2017, which saw approximately one-fifth of infants taken directly to a morgue.<sup>40</sup>
- Inadequate or incomplete infant medical history – at the time of writing, information about medical history was available for 75 of the 80 infants. Health records included a record of this interview in only 26 cases; for the remaining two-thirds (66%, 50) there was no documentation to indicate that a paediatric interview was conducted. In four of the cases where a history was recorded, the information was incomplete and/or inadequate. It appears there has been no improvement in the number of SUDI medical history interviews conducted over the past two years despite a requirement that this be documented. In 2016-2017 the proportion of cases without a medical history interview was also approximately two-thirds of SUDI.<sup>41</sup>
- Post-mortem examination – a full internal post-mortem was conducted in most cases (73 of 80). Our reviews identified six cases where a comprehensive post-mortem did not occur. In all but one of these cases the family objected to an autopsy. One infant was not examined by a forensic pathologist (i.e., no post-mortem was conducted), and five infants underwent an external (1) or external radiology only (4) examination. Post-mortem examination figures in 2018-2019 are similar to the previous two-year period.<sup>42</sup>
- Family support – at the time of writing information was available for 73 of the 80 SUDI. We found evidence of family support and follow up in most (58) of these cases. There was no record of family support in 15 cases. The number of families where there was evidence of support improved considerably in 2018-2019, compared with the 2016-2017 period.<sup>43</sup>

#### 4.4.2. Child protection concerns

Nearly half (36) of the 80 families where an infant died suddenly and unexpectedly had been the subject of a child protection report to the Department of Communities and Justice (DCJ) or to a Child Wellbeing Unit prior to the infant's death. For most (29) of these families at least one report was assessed as meeting the risk of significant harm (ROSH) threshold, and for over half of the families the reported risks included concerns about the infants who later died. Parental alcohol and/or drug misuse, domestic violence, neglect, physical harm or risk of physical harm, and parental mental health were the most frequently reported risks – with multiple risk issues reported in most cases.

40. NSW Ombudsman 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017, incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

41. NSW Ombudsman 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017, incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

42. *ibid*

43. *ibid*

Most infants with a child protection history (81%) were in unsafe sleep environments when they died – including infants sharing a sleep surface, and infants who had been placed for sleep on a couch or sofa or in unsafe cots. Most of the infants with a child protection history (84%) had also been exposed to tobacco smoke – and often, maternal smoking during pregnancy.

## Response to prenatal reports

Fifteen infants who died suddenly and unexpectedly were the subject of a child protection report made during the prenatal period. For all but two families, reports were screened as meeting the ROSH threshold. For six infants, risk issues were reported more than once, including two infants who were the subject of three or more reports during the prenatal period.

Reported concerns generally involved parental alcohol and/or drug abuse (6), domestic violence (5), lack of or non-compliance with antenatal care (5), and homelessness (4). Other reported concerns related to parental mental health, neglect issues, and prior trauma experienced by the mother. For half (8) the matters, multiple risk issues were reported. A 'High Risk Birth Alert' (HRBA) was not triggered for any ROSH reports.<sup>44</sup> HRBA's are issued by DCJ in situations where it is determined that there may be a risk of significant harm to the unborn child after the child's birth. Such alerts are issued to relevant health providers to ensure that DCJ is advised of a birth where protective intervention may be required.

One-third (5) of the families where a prenatal report was made did not receive a casework response from DCJ – these matters were either closed for the stated reason of competing priorities or screened as not requiring a response (non-ROSH). In another two matters further information was sought, or a referral made, and the case closed without face-to-face contact with the family.

Investigations into the cause of the sudden and unexpected deaths were still underway at the time of writing for the majority (10) of the 15 infants who had been the subject of prenatal reports. For the other five infants – cause of death was unable to be determined in most (4) instances; one infant was found to have died from natural causes.

Most (10) of the 15 infants who had been the subject of a prenatal report died in unsafe sleeping environments – either while co-sleeping with adults and/or other children in an adult bed with loose bedding (6), or in a cot or bassinet with loose items such as soft toys, pillows and other suffocation risks present in the sleep environment (4). In one case, a co-sleeper was affected by alcohol.

Nine of the 13 families who were the subject of a ROSH report during the prenatal period received a casework response that included a Safety and Risk Assessment (SARA):

- Five matters were open and allocated child protection cases at the time of the infant's unexpected death.
- Two of the families were referred to Brighter Futures (early intervention) and accepted support from a non-government service provider.
- Two cases were closed after SARA assessment.

Of the four families who did not receive a casework response to a ROSH report during the prenatal period:

- Two matters were closed at triage due to competing priorities.
- One family declined a referral to Brighter Futures (early intervention) and the report was then closed under competing priorities.
- One case was closed after further information was obtained.

Our reviews identified issues with the casework intervention provided in several cases, including inadequate assessment of risk, premature case closure, and lack of follow up of referrals. In a number of matters, these issues were also identified by DCJ through their internal review process.<sup>45</sup> These issues are discussed further in our observations below.

44. 13 of the 15 families were subject to a ROSH report during the prenatal period.

45. The *Children and Young Persons (Care and Protection) Act 1998* requires DCJ to review child deaths. Each year, DCJ is required to report on the number and circumstances of deaths of children who died and were known to DCJ. This includes children and/or their siblings who were reported to be at ROSH within three years before the death of the child, or a child who was in out of home care when they died.

## 4.5. Observations and recommendations

### 4.5.1. SUDI mortality has not declined in the last five years in NSW

Although SUDI has significantly declined over the past 15 years, there has been no real change over the last five years. As we observed in our previous biennial report, ‘simply continuing with the same approaches will now only have marginal effects, particularly among those families most at risk...’<sup>46</sup>

### 4.5.2. Infants were frequently exposed to multiple risk factors that could have been avoided

Our reviews found modifiable risk factors – and generally multiple factors – were present in most cases where infants died suddenly and unexpectedly. This finding indicates a need for ongoing education and promotion of clear and consistent advice to families about safe sleeping.

#### What is a ‘safe environment’ for infants?

The infant is placed to sleep on their back – not on their front or side.

For the first six months after birth, the infant is placed on their own safe infant-specific bedding that, where standards exist, is compliant with those standards.

The environment is free from tobacco smoke.

The infant is dressed appropriately for the conditions (not overdressed) and their head and face are uncovered.

The infant’s environment is free from pillows or other soft objects that pose a suffocation risk – such as adult blankets or quilts, or soft toys.

### 4.5.3. Disadvantaged families are over-represented in SUDI

There has been no real change over the past two years in the characteristics of many families who experience SUDI – we continue to see disproportionately more deaths of infants from disadvantaged families – including Aboriginal families, families known to child protection authorities, families from areas of greater socio-economic disadvantage, and families living in regional locations.

We have previously recommended that NSW Health and DCJ jointly consider initiatives that specifically target high-risk populations and have received advice from each agency about information and resources related to safe sleeping and practices that support parents and carers to keep infants safe during sleep. For example, DCJ has developed casework practice advice and training packages for its practitioners, and NSW Health introduced the *Baby Bundle* – a bag containing baby products and information to support the health, development and well-being of babies born in NSW (one of several initiatives implemented to reinforce safe sleeping in the community).

In our June 2019 report, we again observed that SUDI prevention initiatives should target high-risk populations.<sup>47</sup> We recommended that NSW Health develop and implement strategies to specifically promote safe infant sleep practices to vulnerable families, and that Health and DCJ work together to

46. Quoted from Sidebotham P, Marshall D and Garstang J 2018. Responding to unexpected child deaths in Duncan JR and Byard RW (editors), *Sudden infant and early childhood death: The past, the present and the future*. University of Adelaide Press, Adelaide in our *Biennial report of the deaths of children in 2016 and 2017*, NSW Ombudsman, Sydney.

47. NSW Child Death Review Team (2019). *Biennial report of the deaths of children in New South Wales: 2016 and 2017, incorporating reviewable deaths of children*, NSW Ombudsman, Sydney.

target families known to child protection services. In August 2019, NSW Health published its revised *Safe Sleeping Practices* policy and Clinical Practice Guideline,<sup>48</sup> which contains information for health staff about how to support families.

In July 2020, NSW Health advised us that it initiated meetings with DCJ and Red Nose in late 2019 to discuss opportunities to work together on this issue, however also advised that COVID-19 had interrupted planned work over the previous 12 months.

We acknowledge that there are complex and inter-related factors that contribute to the reasons why certain families are over-represented in SUDI and there are significant challenges to achieving change. We will be seeking further information from NSW Health about progress it has made since the last update to implement our recommendations.

#### **4.5.4. There has been little improvement in the number of SUDI medical histories completed**

While there has been some progress in achieving a more coordinated interagency response to SUDI, there has been little improvement in some key areas – for example, we have not seen an increase in the number of SUDI medical histories completed. This issue is one the CDRT has been monitoring since 2016 when we recommended that identified specialists take a SUDI medical history, and that steps be taken to ensure the information is comprehensive.

NSW Health has acknowledged that further work is required to ensure the SUDI medical history is completed fully to provide the required information to its forensic medicine facilities.<sup>49</sup>

In July 2019, NSW Health issued a revised SUDI medical history protocol, and we note that there will likely be a time lag between the release of this policy and evidence of any change in the number and comprehensiveness of SUDI medical histories taken. Given the policy change, and considering NSW Health's proposed audit of its revised SUDI medical history form (flagged at the November 2019 coronial inquest), we propose to cease monitoring our previous recommendation regarding SUDI medical histories,<sup>50</sup> and instead recommend:

**That NSW Health complete a detailed audit of compliance with the revised SUDI medical history protocol. The audit should include information and analysis about:**

- a. **The number of infants presented to emergency departments following their sudden and unexpected death.**
- b. **The number of medical history interviews conducted in response to these deaths.**
- c. **An assessment of whether the intent of the policy directive has been met and is reflected in the information gathered.**
- d. **Information about the position of the health professional who completed the interviews, the location of the health facility, and the timing of the interview in relation to the death incident.**
- e. **Whether the information gathered in the interview was provided to Forensic Medicine, and the timeliness of this (within 24 hours of the infant's death).**
- f. **Where SUDI medical history interviews are not conducted, whether relevant staff are aware of health's policy, and reasons why the interview was not completed.**
- g. **Details about any strategies or outcomes arising from the audit.**

**NSW Health should provide an audit plan and timeframes to the CDRT by 17 December 2021.**

48. NSW Health 2019. PD2019\_038, Babies – Safe Sleeping Practices. NSW Health, Sydney.

49. NSW Health Pathology's Forensic Medicine service carries out post-mortem examinations and related testing at the direction of the NSW Coroner to help investigate unexplained or unexpected deaths in NSW. See <https://www.pathology.health.nsw.gov.au/latest-news/our-networks/forensic-medicine> for further information, accessed 19 May 2021.

50. NSW Child Death Review Team 2016. Child Death Review Team Report 2015, Recommendation 3(c). NSW Ombudsman, Sydney.

## 5. Injury: an overview

In 2018 and 2019, 160 infants and children died as a result of injury in NSW.

On average, two of every five deaths of children aged from 1-17 years in NSW are from injury-related causes.

Over the past 15 years, there has been a decline in mortality across all injury-related causes except suicide, which has increased.

Young people aged 15-17 years have the highest injury-related mortality rate of any age group.

Aboriginal children, families with a child protection history, and children living in the most disadvantaged areas of NSW are also over-represented in injury-related deaths.

### 5.1. Injury fatalities in 2018-2019, and trends

This chapter provides an overview of the injury-related deaths of 160 infants and children aged 0-17 years who died in 2018 and 2019. The 160 deaths represent 16% of all child deaths in the period. This chapter also considers trends in injury-related deaths between 2005-2019.

The 160 injury-related deaths include unintentional causes such as motor vehicle crashes and drowning, and intentional causes of suicide and homicide.

More detail about certain causes of fatal injury is included in subsequent chapters:

- Chapter 6: Transport
- Chapter 7: Drowning
- Chapter 8: Other unintentional injury
- Chapter 9: Suicide
- Chapter 10: Abuse and neglect<sup>51</sup>

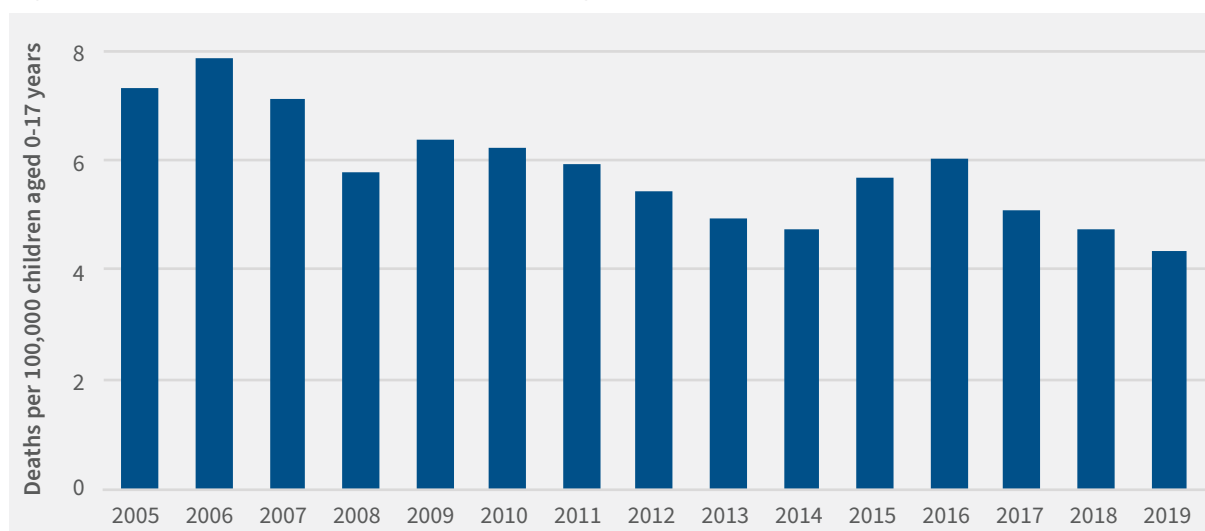
Twenty-one of the 160 injury-related deaths were reviewable by the Ombudsman, including children who died as a result of abuse (15), neglect (2), in suspicious circumstances (2), and/or who were in care (5) at the time they died.

Over the 15-years to 2019, there has been a significant overall decrease in the injury-related mortality rate among infants and children aged 0-17 years. The rate has declined from 7.3 deaths per 100,000 children in 2005 to 4.3 per 100,000 children in 2019. However, there has been little significant change in the past decade (2010-2019).

51. In chapter 10 abuse and neglect-related deaths are considered according to their reviewable status, not cause of death. In this chapter, only abuse-related deaths are included because abuse is a cause of death reporting category.



**Figure 35. Injury-related child mortality rate (aged 0-17 years) by year, NSW 2005-2019**



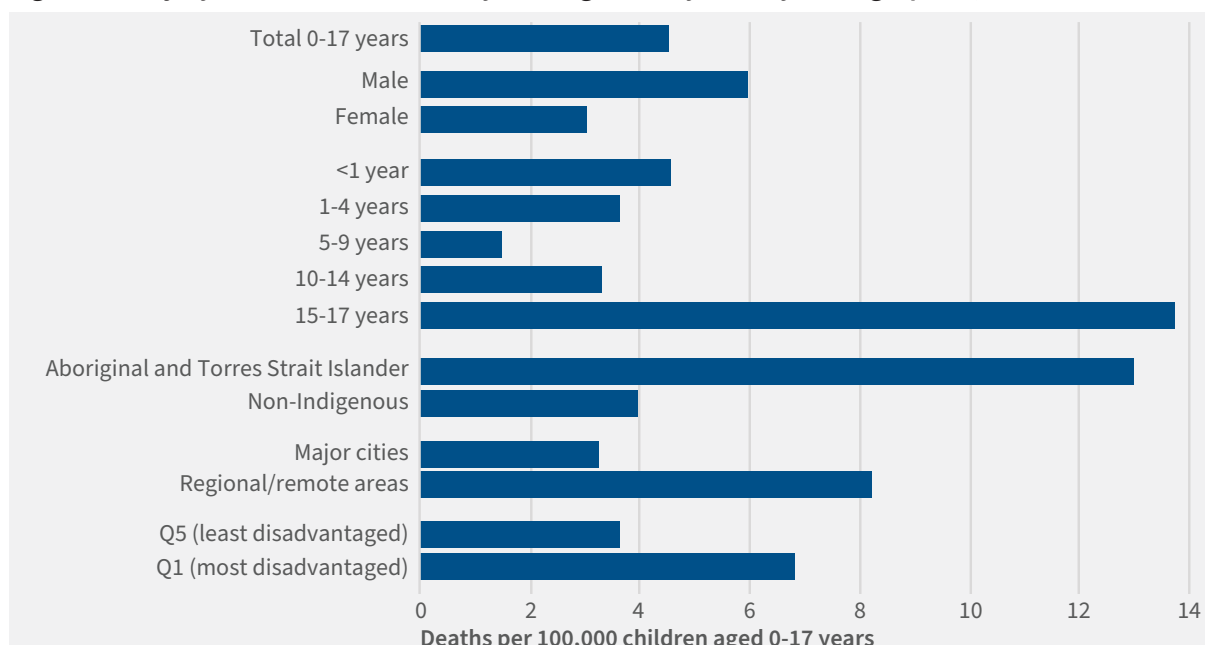
### 5.1.1. Injury-related deaths by demographics

In 2018 and 2019, 151 of the 160 injury deaths were children aged 1-17 years, and nine were infants under one year. Two-thirds (68%, 108) of the infants and children were males. The higher mortality rate of male children due to injury compared with female children has been consistent over time.

Nearly half (47%, 75) of the 160 deaths were young people aged 15-17 years. This age group had the highest injury-related mortality rate of any other age group.

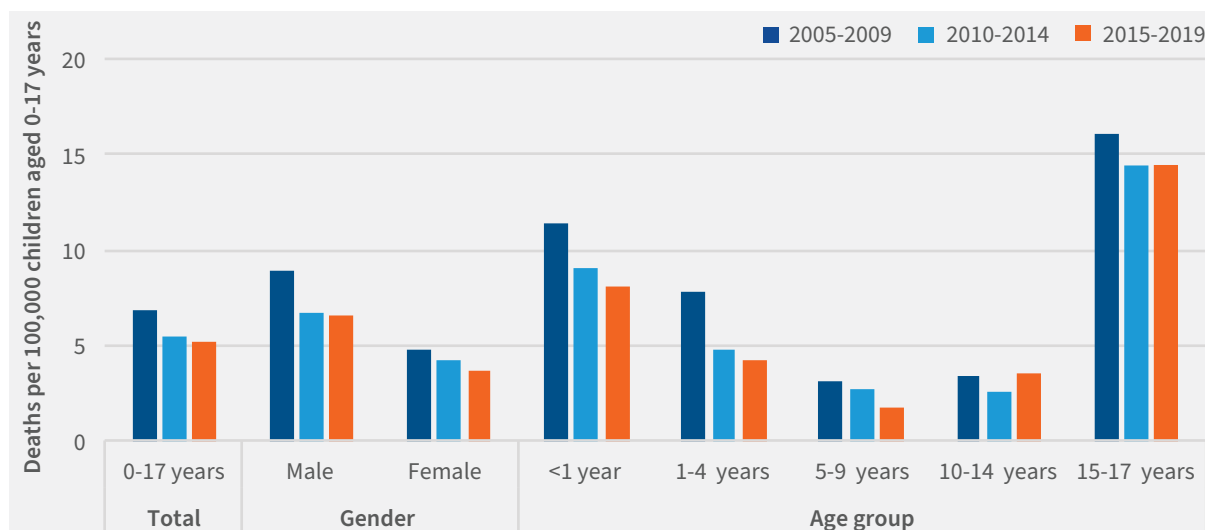
In 2018 and 2019, children living in regional and remote areas, children living in the most disadvantaged areas, and Aboriginal and Torres Strait Islander children were also over-represented in injury-related deaths.

**Figure 36. Injury-related child mortality rate (aged 0-17 years) by demographics, NSW 2018-2019**



The distribution of injury-related deaths among infants and children for the 15-year period to 2019 is shown in the figure below. The high rate for infants under one is largely due to their age-related vulnerability and includes infants who die from accidental asphyxiation in the context of an unsafe sleep environment. Sudden and unexpected deaths of infants are discussed in more detail in Chapter 4.

**Figure 37. Injury-related child mortality rate (aged 0-17 years) by gender and age group, NSW 2005-2019**



## 5.2. Injury-related deaths by cause

In 2018 and 2019, transport fatalities (34%) and suicide (32%) accounted for two-thirds of all injury-related deaths among infants and children aged 0-17 years in NSW.

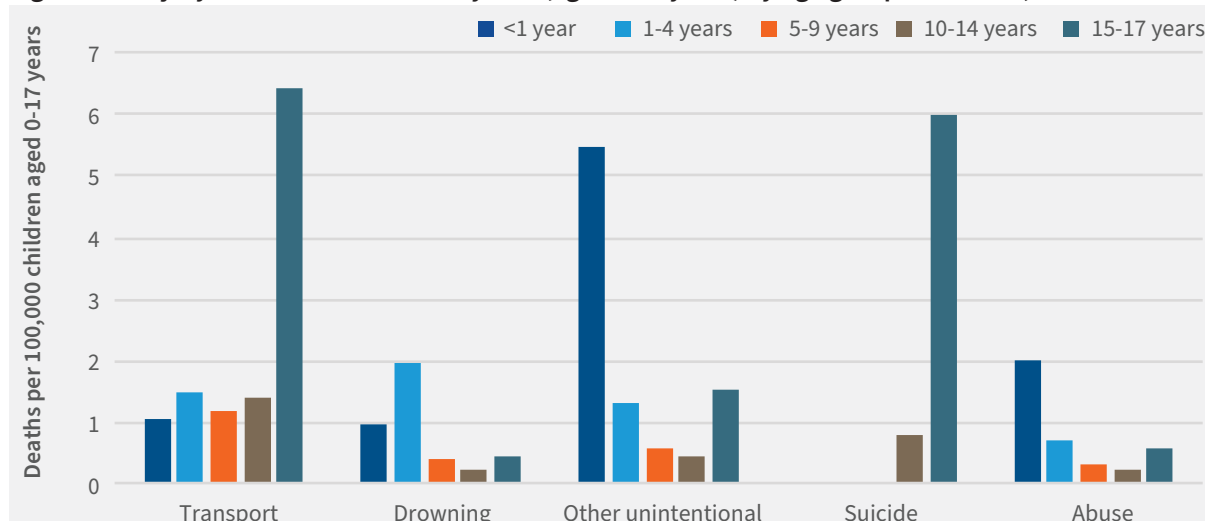
As noted earlier, while the overall mortality rate for all injury-related causes significantly decreased over the 15-year-period 2005-2019, the rate for suicide among young people aged 10-17 years has significantly increased, unlike any other cause of injury-related death. This increase is discussed in more detail in Chapter 9.

### 5.2.1. Causes of injury-related deaths by age and gender

There are clear differences in injury-related causes of death by gender. Males were significantly more likely than females to die from drowning (2.1 times more likely), by suicide (2.0 times more likely) and in transport fatalities (1.8 times more likely).

Similarly, causes of injury-related mortality are closely associated with the age of a child or young person. Young people aged 15-17 years were consistently over-represented in transport fatalities and suicide during the 2005-2019 period and had the highest mortality rate for these causes. Infants aged less than one had the highest mortality rate for other unintentional injuries (such as threats to breathing in the context of unsafe sleeping) and abuse due to their significant vulnerability.

**Figure 38. Injury-related child mortality rate (aged 0-17 years) by age group and cause, NSW 2005-2019**





## 5.2.2. Causes of injury-related deaths by Aboriginal and Torres Strait Islander status

The higher overall injury-related mortality rate for Aboriginal and Torres Strait Islander infants and children was observed in every cause of injury – transport, suicide, drowning and abuse – and was significantly higher than non-Indigenous infants and children for all causes of injury except drowning.

## 5.2.3. Causes of injury-related deaths by remoteness and socio-economic status

There are differences in causes of injury-related death according to remoteness and socio-economic status. For example, children living in regional and remote areas of NSW were significantly more likely (2.9 times) to die in transport crashes, compared to children living in major cities.

Likewise, the mortality rate for children living in the most disadvantaged areas of the state was higher for all causes of injury, compared with children living in the least disadvantaged areas.

## 5.3. Child protection history

In 2018 and 2019, 44% (70) of the 160 children who died from injury-related causes were from families with a child protection history. In over three-quarters (55) of these families, the child who died or a sibling was the subject of a report screened as meeting the ‘risk of significant harm’ (ROSH) threshold.<sup>52</sup>

In particular, infants and children with a child protection history are over-represented among those who died from abuse, and young people aged 10-17 years who died by suicide. The need for prevention initiatives that target vulnerable families and high-risk populations is discussed in more detail in Chapters 9 and 10.

## 5.4. Observations

### 5.4.1. Injury-related deaths are the ‘tip of the iceberg’ for childhood injury

Injuries are the leading cause of death and disability in children, and childhood injury hospitalisation rates in Australia have remained relatively stable over time.<sup>53,54,55</sup> Children who die of injuries are therefore the ‘tip of the iceberg’ in terms of the burden of childhood injury in Australia.<sup>56</sup> However, the main causes of injury-related deaths are substantially different to the causes of injuries requiring hospitalisation. For example, falls are a leading cause of hospitalised injury but account for relatively few deaths. Similarly, drowning causes a high proportion of injury-related death but a low proportion of injury-related hospitalisations.

### 5.4.2. Injury-related child deaths are decreasing in NSW except for suicide

Overall, there was a significant decline in injury-related child deaths in NSW between 2005-2019. Contrary to this overall trend, suicide deaths among young people aged 10-17 years have continued to increase over the period.

52. The other 15 families with a child protection history were either the subject of a non-ROSH (9) or CWU (6) report.

53. Australian Institute of Health and Welfare 2020. Australia’s children. Cat. No. CWS 69. Australian Institute of Health and Welfare, Canberra.

54. Kyu HH, Pinho C, Wagner JA et al 2016. Global and national burden of diseases and injuries among children and adolescents between 1990 and 2013: Findings from the global burden of disease 2013 study. *JAMA Pediatrics*, 170, 267-87.

55. Mitchell R, Curtis K, Forster K 2018. A 10-year review of child injury hospitalisations, health outcomes and treatment costs in Australia. *Injury Prevention*, 24(5), 344-50.

56. Australian Institute of Health and Welfare 2020. Australia’s children. Cat. No. CWS 69. Australian Institute of Health and Welfare, Canberra.

### 5.4.3. Injury-related deaths are higher for certain groups of children

Although injury rates have declined, some groups of children and young people continue to be over-represented in injury-related deaths – males, children living in the most disadvantaged areas of the state, those living in regional and remote areas, and Aboriginal and Torres Strait Islander children.

In 2018, we published a report of research conducted by the Australian Institute of Health and Welfare (AIHW) which undertook geospatial analyses of child deaths in NSW between 2001 and 2015.<sup>57</sup> The findings confirmed *‘the increased likelihood of a child dying in our state if they live in a disadvantaged area, and specifically, if they live in an area characterised by high poverty, low school engagement, overcrowded housing, and childhood developmental vulnerability.’*

Other research has also highlighted that the risk of injury hospitalisation for children aged 0-16 years differs according to socio-economic status, with more disadvantaged young people having a higher prevalence of pedestrian collisions, assault and poisoning compared to young people living in more advantaged areas of Australia.<sup>58</sup>

More broadly, the Australian government has committed to developing a *National Injury Prevention Strategy 2020-2030* (the Strategy). The Strategy is currently in the final stages of development, having concluded stakeholder feedback on the Consultation Draft National Injury Prevention Strategy.<sup>59</sup> Once finalised, the Strategy aims to put a national focus on injury prevention and to reduce injury across all age groups and population groups using evidence-based approaches, and focusing on those groups at highest risk. At the time of writing, the NSW Children and Young People Injury Prevention Working Group is awaiting the release of the Strategy to determine how best to align state goals with the national approach.<sup>60</sup>

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57. NSW Child Death Review Team 2018. Spatial analysis of child deaths in New South Wales. NSW Ombudsman, Sydney.

58. Seah R, Lystad RP, Curtis K, Mitchell R 2018. Socioeconomic variation in injury hospitalisations in Australian children 16 years: a 10-year population-based cohort study. *BMC Public Health*, 18, 1336.

59. Australian Government Department of Health 2021. National Injury Prevention Strategy 2020-2030. Accessed from <https://www.health.gov.au/initiatives-and-programs/national-injury-prevention-strategy-2020-2030-0> on 1 March 2021.

60. The NSW Children and Young People Injury Prevention (CYPIP) Working Group, chaired by the Advocate for Children and Young People, is a group of experts including academics and representatives of government and non-government agencies concerned with the prevention of injuries to children and young people. Accessed from <https://www.acyp.nsw.gov.au/cypip-report-2020#:~:text=The%20NSW%20Children%20and%20Young,to%20children%20and%20young%20people> on 19 May 2021.

## 6. Transport

In 2018 and 2019, 54 infants and children died in transport-related incidents, the majority due to vehicle crashes (including collisions with pedestrians).

Transport fatalities were the second leading cause of death for young people aged 15-17 years in the two-year period.

Although the rate of death from transport injuries has declined by more than half over the past 15 years, it has not changed significantly in the past decade. The decline has mostly been in relation to child passenger and pedestrian fatalities.

Along with gender, age and inexperience, and geographic characteristics, such as where a child or young person lives, were apparent. Children and young people living in regional or remote areas of NSW, and those from the most socio-economically disadvantaged areas, were around three times more likely to die in a transport incident than those living in major cities or the least disadvantaged areas.

Unsafe driver behaviours – such as speeding, alcohol and/or drug use – are key factors in many transport fatalities, especially in combination with driver inexperience.

In more than half of the incidents in which an ‘at fault’ driver was identified, the person at fault was under 25 years and in most cases, a learner or provisional licence holder.

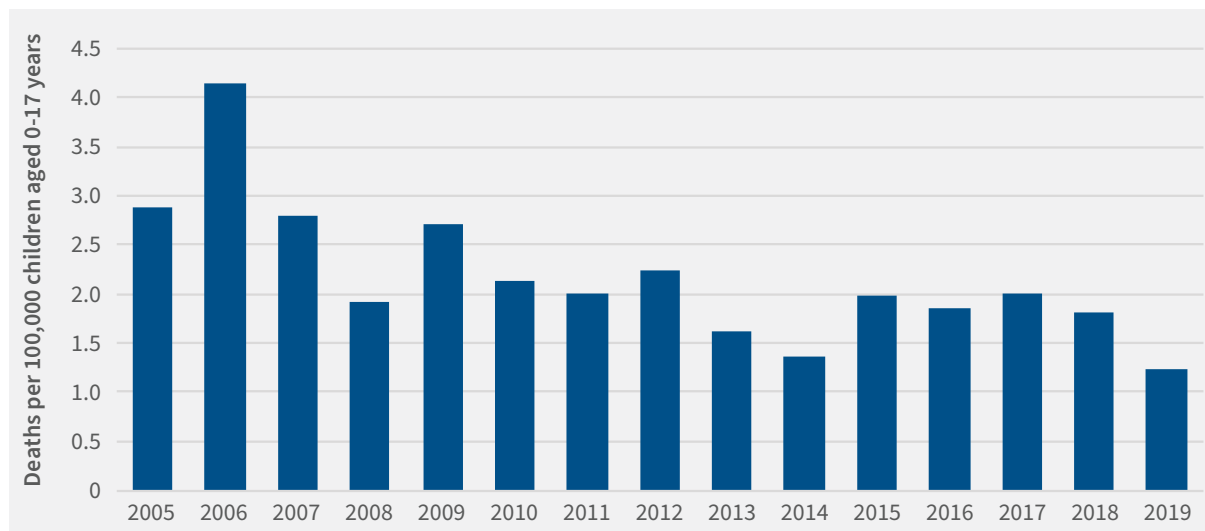
### 6.1. Transport fatalities in 2018-2019, and trends

This chapter examines the deaths of 54 infants and children who died in transport fatalities in NSW in 2018 and 2019.

Three of these transport fatalities were reviewable by the NSW Ombudsman, including two children in care and one child whose death occurred in the context of neglect.

Over the 15 years to 2019, there was a significant overall decrease in the transport-related mortality rate, however, there has been no significant change in the mortality rate over the past decade.

**Figure 39. Transport-related child mortality rate (aged 0-17 years) by year, NSW 2005-2019**

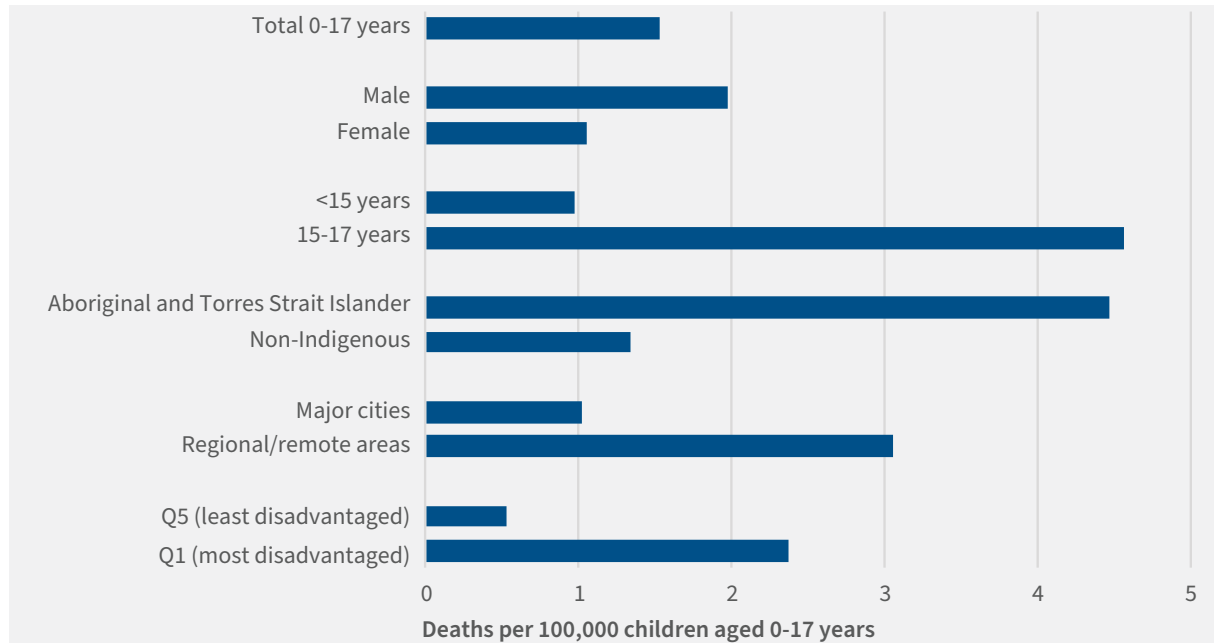


### 6.1.1. Transport fatalities by demographics

Consistent with previous years, older children and males were over-represented in transport fatalities. Nearly half (46%, 25) of the 54 children who died were young people aged 15-17 years. Two-thirds (36) of the 54 children who died were males.

Aboriginal and Torres Strait Islander children, those from regional and remote areas, and those living in the most disadvantaged areas of NSW were also over-represented in transport fatalities.

**Figure 40. Transport-related child mortality rate (aged 0-17 years) by demographics, NSW 2018-2019**



Remoteness and socio-economic status were also previously highlighted as important characteristics in transport fatalities in our published review into the deaths of 66 children (aged 0-12 years) who died as passengers in NSW during the 10-year period 2007-2016.<sup>61</sup> The focus of the study was on the role of seatbelts and child restraints in the deaths of child passengers in vehicle crashes during the 10-year period, 2007-16. Among the findings, it was noted that most of the children – four of every five – died in crashes that occurred outside of major cities, and that two-thirds of the children lived in the most disadvantaged areas of the state.

The CDRT made four recommendations to Transport for NSW (TfNSW) in 2019 as a result of the study findings, including:

*TfNSW (Centre for Road Safety) should actively promote information on best practice for restraining children over the age of seven years. Promotion activities should particularly target culturally and linguistically diverse (CALD) communities, Aboriginal and Torres Strait Islander communities, and areas of low socio-economic disadvantage.*<sup>62</sup>

Transport for NSW supported this recommendation and has since provided advice about strategies it has implemented, including engagement and training of 13 service providers to correctly fit child restraints, along with the development of plans by its Aboriginal Engagement team to hold local community engagement events in Aboriginal communities. At the time of writing, events had been held in Grafton, Malabugilmah, Baryulgil, Iluka, and Bourke. Transport for NSW has also indicated strategies are in place to develop and deliver educational activities and material.

61. NSW Child Death Review Team 2019. The role of child restraints and seatbelts in passenger deaths of children aged 0-12 years in NSW. NSW Ombudsman, Sydney.

62. NSW Child Death Review Team 2019. Biennial report of the deaths of children in NSW in 2016 and 2017, incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

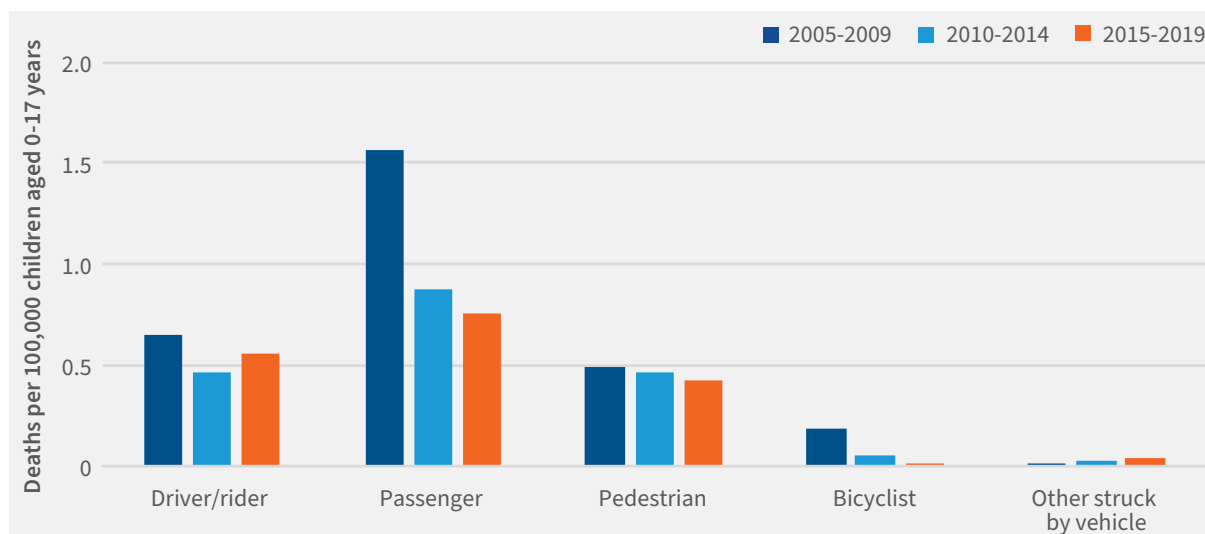
## 6.1.2. Transport fatalities by nature of incident

The 54 infants and children died in 54 separate incidents. Most of these children were travelling in a vehicle:

- 23 children were passengers in vehicles – primarily motor vehicles (17). Other passenger deaths involved all-terrain vehicles, watercrafts, and a motorcycle.
- 16 children, mostly older teenagers, were drivers in control of a vehicle. Ten collisions occurred on public roads and six collisions occurred off-road – involving a utility, all-terrain vehicle, motorcycle, dirt bikes and motorised pushbike.
- 15 children were pedestrians struck by a vehicle. Five children aged between one and seven years died in low-speed run-over incidents. Most of the other pedestrian deaths occurred on roadways.
- One child was a bicyclist struck by a heavy vehicle.

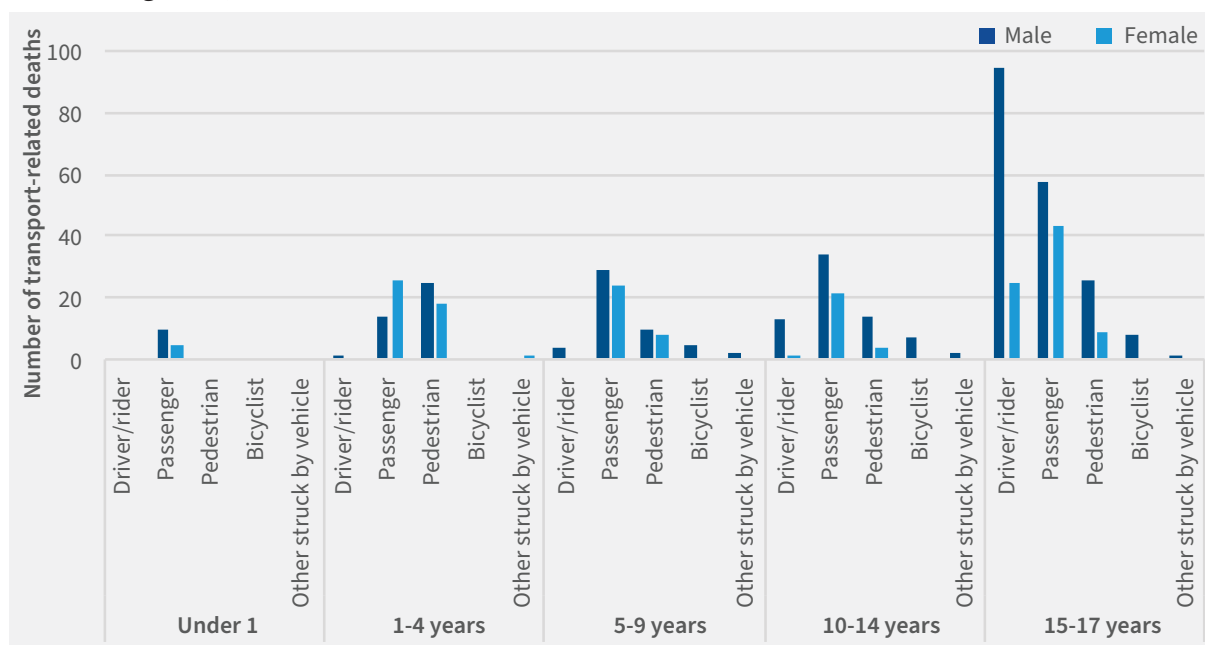
Over the 15-year period 2005-2019, child passenger deaths have declined significantly. The mortality rate for young drivers has increased slightly over the past five years.

**Figure 41. Transport-related child mortality rate (aged 0-17 years) by nature of incident, NSW 2005-2019**



As noted above, males are over-represented in transport fatalities. This trend is shown in all age groups and incident types below, noting the predominance of males in driver deaths in the 15-17 year-old age group.

**Figure 42. Number of transport-related deaths of children 0-17 years by nature of incident, age and gender, NSW 2005-2019**



### 6.1.3. Transport fatalities by ‘fault’

In 39 of the 54 collisions, police determined that a driver or rider was ‘at-fault’ in the incident. Of the at-fault parties, 24 survived the incident, and of these, 23 faced charges resulting from the incident, including manslaughter, dangerous driving occasioning death, or negligent driving occasioning death.

Most (24) of the at-fault drivers/riders were under 25 years of age, and nearly half (18) were young people aged 15-17 years. Of the 18 young people considered by police to have been ‘at fault’ in a fatal incident, 14 died as a result of the incident.

Among the 24 at-fault drivers/riders under 25 years of age:

- Eleven held a provisional licence – either P1 (10) or P2 (1)
- Nine had never held a licence (including in seven incidents where a licence was not required because the incident occurred on private land or the person was driving/riding a bicycle or all-terrain vehicle)
- One was an unsupervised learner driver
- One held a standard licence
- For two, the licence status was not known at the time of writing this report.

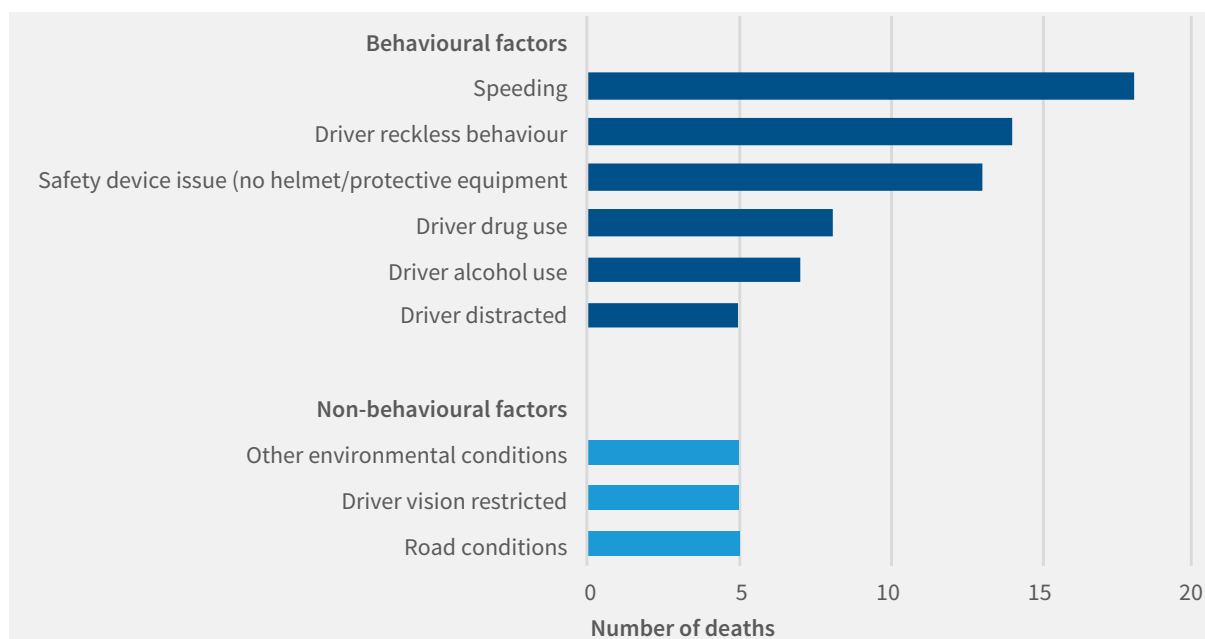
Most (15) of the incidents that involved under 25-year-old at-fault drivers/riders occurred on public roads. The remaining fatalities occurred at other locations such as private properties or off-road public areas.

Unsafe driver/rider behaviour was identified by investigating police in almost all (20) of the 24 incidents – primarily speeding and/or reckless driving. In many (14) instances the young driver/rider died in the incident. In the other 10 crashes, a child other than the young at-fault driver/rider was killed.

## 6.2. Factors identified in transport-related deaths, 2018-2019

Drawing on police crash investigations and other relevant records, the main contributory factors identified in the incidents resulting in the death of a child in the two-year period included speeding, driving under the influence of alcohol and/or drugs, age and inexperience, vehicle safety, and environmental conditions. Often, more than one risk was identified.

Figure 43. Factors identified in transport-related deaths of children aged 0-17 years, NSW 2018-2019



### 6.2.1. Speeding

Driving too fast is the single biggest contributor to death and injury on NSW roads, contributing to around 41% of road fatalities and 24% of serious injuries each year.<sup>63</sup> Speed increases both the risk of having a crash and the severity of the crash outcome.

Speeding was identified in more than one-third (18) of the 54 transport fatalities in 2018-2019. These fatalities include incidents that occurred on both public and private roads, and on cycleways, where the deceased child was either a driver, passenger or pedestrian. Speeding was generally coupled with other factors such as driver inexperience, reckless driving, and – in six cases – alcohol and/or drug use.

Thirteen of the 18 incidents where speeding was a contributory factor involved drivers under 25 years of age – all but one were novice drivers or riders aged 15-17 years. The other five speed-related fatalities involved children travelling as passengers in vehicles on public roads.

### 6.2.2. Reckless driving

Reckless driving was identified in 14 – one in every four – of the transport fatalities. Reckless driving was generally associated with speeding, as well as with alcohol and/or drug use.

Half (7) of those drivers identified as having engaged in reckless driving were under 25 years of age, including four P1 licence holders and one young person who had never held a licence.

All but one of the other drivers (those aged 25 years and over) were other road users unknown to the child who died.

### 6.2.3. Driving under the influence of alcohol and drugs

Alcohol and other drugs are well known dangers for drivers, which affect skills and concentration, mood, and behaviour. Research has shown that the combination of drugs and alcohol increases risk of a crash by 23 times.<sup>64</sup>

NSW has three blood alcohol concentration (BAC) limits: zero, under 0.02 and under 0.05, depending on the category of your licence and the type of vehicle you are driving. Random breath testing and Mobile Drug Testing (which targets cannabis, cocaine, methamphetamine – also known as speed or ice, and MDMA – known as ecstasy) are strategies that aim to reduce alcohol and drug-related crashes – and deaths – on NSW roads.

Crash investigations identified drug and/or alcohol use as a factor in almost one-quarter (12) of the collisions that resulted in the death of a child in 2018 and 2019. Seven drivers were affected by alcohol, eight by drugs, and in three cases, by both. All drivers who were identified as having drugs in their system had used illicit drugs that are detected in current testing kits.

### 6.2.4. Age and inexperience

Younger and less experienced drivers face many challenges when learning to drive and in their first months and years of driving without supervision. There is a much higher risk of being involved in a crash for inexperienced drivers. The NSW Centre for Road Safety notes that crashes involving younger drivers (those aged under 26 years) account for almost a quarter of annual road fatalities, despite this age group making up only about 15% of all licence holders.<sup>65</sup>

More than one-third (18) of the at-fault drivers in fatal collisions were inexperienced young drivers under 18 years of age. As noted, most were provisional licence holders – the others had never held a licence or were a learner. For these young drivers, inexperience was often coupled with other factors. Eleven were

63. Transport for NSW Centre for Road Safety 2021. Driving too fast. Accessed from <https://roadsafety.transport.nsw.gov.au/speeding/index.html> on 27 February 2021.

64. Transport for NSW Centre for Road Safety 2021. Alcohol and other drugs. Accessed from <https://roadsafety.transport.nsw.gov.au/stayingsafe/alcoholdrugs/index.html> on 27 February 2021.

65. Transport for NSW Centre for Road Safety 2021. Younger and novice drivers. Accessed from <https://roadsafety.transport.nsw.gov.au/stayingsafe/drivers/youngdrivers/index.html>



driving more than the sign-posted speed limit or at a speed too fast for the road and environmental conditions, five were under the influence of alcohol and/or illicit drugs and six were driving in a reckless manner. For eight of these drivers, a combination of two or more of these factors were identified.

## 6.2.5. Restraints and protective equipment

### Seatbelts and restraints

NSW legislation requires that on public roads, all drivers and passengers of moving vehicles or stationary (but not parked) vehicles are to be appropriately restrained. All children under seven years of age must be fitted in an age-appropriate child restraint, and the restraint must be properly fitted to the vehicle.

As noted above, in 2019, we published the results of our review into the deaths of children aged 0-12 years who died as passengers in crashes in NSW.<sup>66</sup> This review found that over half the children (35 of the 66 child passengers) were not properly restrained in the vehicle, and that for almost one in three of the children (30%, 20), the improper use of, or failure to use, a child restraint or seatbelt, played a primary contributing role in their death.

The lack of a seatbelt or child restraint, use of an age-inappropriate restraint, or use of an incorrectly fitted restraint was a factor in the deaths of five child passengers in 2018-2019. Those children were either not wearing a seatbelt (3) or were not using a seatbelt correctly (2); for example, by lying across the seat of a car with the shoulder strap removed.

In March 2021, Neuroscience Research Australia (NeuRA) and Kidsafe Australia released updated guidelines on the best practice recommendations for how to safely transport children in motor vehicles.<sup>67</sup> Recommendations in the updated guidelines include:

- Strengthened advice on using the ‘5 Step Test’<sup>68</sup> when transitioning a child from a booster seat to an adult seatbelt
- Children should use a restraint or booster seat when travelling in rideshares, rental cars and taxis
- Children should be encouraged to sit in an upright position so their restraint works at its best
- Children aged 4-8 years should use an add-on booster seat in preference to an integrated booster seat; children 9 years and older can use an integrated booster seat if the vehicle has a side curtain airbag where they are seated
- Low birthweight babies should be placed in an infant restraint designed for low birthweight babies until they can get good harness fit in a standard restraint.

In 2021, the Child Restraint Evaluation Program commenced new test procedures, specifications, and scoring protocols for assessing the crash protection performance of child car seats. The latest protocols introduced new elements,<sup>69</sup> including the intruding door side impact test. Other improvements include a new test rig which is more representative of current popular vehicles, and the use of the Q-series family of anthropomorphic test devices (test dummies), which offer improved bio-fidelity (the quality of humanlike movement) and the ability to measure biomechanical injury metrics that are relevant to child occupant safety.

66. NSW Child Death Review Team 2019. The role of child restraints and seatbelts in passenger deaths of children aged 0-12 years in NSW. NSW Ombudsman, Sydney.

67. Neuroscience Research Australia and Kidsafe Australia 2020. *Best Practice Guidelines for the Safe Restraint of Children Travelling in Motor Vehicles, 2nd Edition*. Neuroscience Research Australia, Sydney.

68. Neuroscience Research Australia 2021. National Best Practice Guidelines – Safety of Children in Motor Vehicles. Accessed from <https://www.neura.edu.au/crs-guidelines> on 12 May 2021.

69. The new elements are sourced from the United Nations Economic Commission for Europe Regulation 129.



## Helmets

In NSW, on-road motorcycle riders are required to wear an approved motorcycle helmet that is securely fitted and fastened. Children under eight years old are not allowed to be a pillion passenger on a motorcycle.<sup>70</sup> However, on private property there is currently no legislated minimum age for child riders, and no requirement to use a helmet, on motorcycles, quad bikes, or side-by-side vehicles.

In 2018-2019, five children riding motorbikes, motorised cycles, all-terrain vehicles, or bicycles were not wearing helmets. For three of these, the cause of death was directly associated with head trauma. Two of these deaths occurred on public roads or cycleways; the remaining three deaths occurred off-road on private property.

### 6.2.6. Environmental factors and visibility

Environmental factors such as heavy rain, poor visibility on the road, and poor road conditions can contribute to vehicle crashes – particularly if drivers are not driving to account for those conditions.

Environmental conditions such as weather were identified as a factor in the deaths of nine children, including restrictions in driver vision (5) and road conditions (5). Driver vision can be restricted by other vehicles, lighting, and trees on the side of the roadway, for example. Road conditions include water or flooding, road works, and unsealed road surfaces.

### 6.2.7. Driver distraction

Common driver distractions include young children in the car, carrying out tasks other than driving within the vehicle (such as using a mobile phone), and distractions outside the vehicle.

Driver inattention or distraction was identified as present in incidents that involved the deaths of five children and young people, including two collisions involving never licensed or learner permit male drivers.

### 6.2.8. Vehicle safety

Vehicle safety features can significantly improve road safety. Safety technologies such as blind spot monitoring and autonomous emergency braking can reduce the risk of a crash. Safety features such as side curtain air bags can reduce the risk of serious injury or death where a crash occurs. Crash avoidance technology to help prevent crashes is slowly being introduced. Later model cars generally have more advanced safety technology and a lower risk of death or serious injury. Older model vehicles are over-represented in fatal vehicle crashes.<sup>71</sup> TfNSW has supported a Consultation Regulatory Impact Statement which would mandate some Autonomous Emergency Braking (AEB) features in new vehicles beginning July 2022.

#### Vehicle safety ratings

The Australasian New Car Assessment Program (ANCAP) is an independent vehicle safety rating system.<sup>72</sup> ANCAP star ratings indicate the level of safety a vehicle provides for occupants and pedestrians in the event of a crash, as well as its ability – through technology – to avoid or minimise the effects of a crash.<sup>73</sup> The more stars, the better the vehicle performed in ANCAP crash tests. To achieve the maximum five-star ANCAP safety rating, a vehicle must achieve the highest standards in all tests and feature advanced safety assist technologies.

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70. Under Rule 271 of the Road Rules 2014.

71. Australia New Car Assessment Program (ANCAP) 2021. Accessed from <https://www.ancap.com.au/WhoSurvives> on 7 May 2021.

72. Australia New Car Assessment Program (ANCAP) 2021. Accessed from <https://www.ancap.com.au> on 27 February 2021.

73. Australia New Car Assessment Program (ANCAP) 2021. About ANCAP. Accessed from <https://www.ancap.com.au/about-ancap> on 27 February 2021.

ANCAP was established in 1992. Since then, the program has evolved with progressive changes made to its rating system. Annual increases to ANCAP safety rating criteria for all star rating levels have been in place since 2011, with the most significant changes occurring from 2018 when common test protocols and assessment methods between Australasia and Europe were adopted. These requirements are now updated every two years.<sup>74</sup> The ANCAP system covers four key areas – adult occupant protection, child occupant protection, vulnerable road user protection, and safety assistance.<sup>75</sup>

Along with star rating levels, vehicles are given a ‘Rating Year’ date stamp that identifies how recent an ANCAP safety rating is.<sup>76</sup> With the improved testing criteria, the safest vehicles are those with the maximum five-star ANCAP rating and latest date stamp. ANCAP safety ratings are best used when comparing new cars.

Used car safety ratings (UCSR) are produced by the Vehicle Standards Research Group and help identify safer vehicle models among older vehicles. UCSRs provide ratings from one to five stars that show how well a vehicle protects its driver from death or serious injury in a crash. UCSRs are available for a select number of vehicles, generally models over three years old, whereas ANCAP safety ratings apply to new vehicles.

While ANCAP safety ratings are determined based on the results of a series of independent tests and safety assessments, UCSRs are calculated using data from millions of police reports of actual on-road crashes in Australia and New Zealand. Other factors such as vehicle mass and safety features are also considered, and the Driver Protection rating is adjusted for factors such as driver gender and age, type of road user, speed limits, and the year and location of the crash. Additional safety ratings are calculated to estimate the risk the vehicle poses to other road users. These additional ratings are used alongside the Driver Protection rating to determine whether a vehicle is considered a ‘Safer Pick’.<sup>77</sup> UCSRs are updated annually and are most useful when purchasing a used car.

Not all vehicles are rated by ANCAP or the UCSR. For example, some vehicles may be too old or may not otherwise have been tested.

Of the 54 children that died in transport incidents in 2018 and 2019, just over half (28) were travelling in a car – either as a passenger or driver. The remaining matters involved other types of vehicles (e.g., motorbikes, train, boat, cyclists, etc) or pedestrians. Of the 28 cars:

- 13 of the 28 had an ANCAP safety rating. Of these, only two had the latest rating available, both 5-stars. The other 11 cars had a rating that was 8-17 years old and had been superseded by testing of more recent models.
- 22 of the 28 cars had a UCSR. Of these, most (18) had a 1 or 2-star rating; only 4 had a rating of 3 or 4-stars. None had a rating of 5-stars.
- Most (11) of the 13 cars with an ANCAP rating also had a UCSR.
- 3 of the 28 cars did not have any safety rating. For two of these, a safety rating was not available due to the age of the vehicles – both were over 25 years old. For the remaining vehicle, the age of the car was not known.

In summary, of the 28 vehicles only two had a recent 5-star ANCAP safety rating and none of the vehicles had a 5-star UCSR. Almost all these vehicles (24) were over 10 years old.

In June 2020, Transport for NSW advised that the Vehicle Standards Research Group is working with ANCAP to update vehicle safety ratings so that the UCSR replaces the ANCAP rating when appropriate. Once the criteria for transitioning between both ratings has been finalised, they will be promoted on

74. Australia New Car Assessment Program (ANCAP) 2021. Safety ratings explained. Accessed from <https://www.ancap.com.au/safety-ratings-explained> on 4 May 2021.

75. Australia New Car Assessment Program (ANCAP) 2021. Safety testing explained. Accessed from <https://www.ancap.com.au/safety-testing-explained> on 4 May 2021.

76. Australia New Car Assessment Program (ANCAP) 2021. Frequently asked questions. Accessed from <https://www.ancap.com.au/frequently-asked-questions> on 4 May 2021.

77. Transport for NSW 2021. 2020 Used Car Safety Ratings. Accessed from <https://roadsafety.transport.nsw.gov.au/downloads/ucsr-202.pdf> on 4 May 2021.

a website that will allow consumers to search vehicles within a price range and will provide either the ANCAP or UCSR as most appropriate to that vehicle. Transport for NSW considers this will boost the influence of the UCSR. We support this enhancement to the safety rating systems.

TfNSW has supported the addition of testing protocols for advanced driver-assistance systems (ADAS) by ANCAP, including by developing the first ADAS assessment facility in Australia.<sup>78</sup> ANCAP test protocols now assess the vehicle's autonomous braking, including assessing the capability of the vehicle's automatic emergency braking system to avoid a child dart-out type crash and general crash avoidance for pedestrians and cyclists in different scenarios.<sup>79</sup>

## Vehicle safety in low speed run-overs

Larger vehicles are over-represented in driveway run-overs.<sup>80</sup>

In the two-year period, five children aged 7 years and under were struck by a vehicle at low speed in a driveway or other private location (low-speed vehicle run-over). Two of these vehicles were three years-old or less and had a current 5-star ANCAP rating.<sup>81</sup> The other three vehicles were all over 12 years old; two had a 3-star UCSR and one had a 1-star UCSR. Three of the deaths involved utility vehicles;<sup>82</sup> the other deaths involved a sports utility vehicle<sup>83</sup> (1) and a caravan under tow (1).

Technology that increases rearward visibility including reversing cameras, and active safety systems such as pedestrian detection sensors, help drivers to detect objects around a vehicle. Autonomous emergency braking will stop a vehicle where the sensors have detected a risk and a driver has not responded. The evidence that advanced safety technologies reduce the risk of serious injury or death for pedestrians, particularly reversing cameras in reducing the risk of a back-over crash, is far greater for standard cars than for larger vehicles such as utilities.<sup>84</sup>

In June 2019, we recommended that Transport for NSW, in the context of the evaluation of *'They're counting on you'* (a campaign established to educate drivers on driveway safety), consider further action to prevent these types of deaths. In June 2020, Transport for NSW provided advice about its initiatives to promote good practice and carer education. For example:

- Creating the 'It only takes a second' teddy bear poster
- Sharing driveway safety messages via the Road Safety Facebook page throughout the year
- Developing a Driveway Safety Kit, which highlights the difficulty drivers have seeing small children, especially behind reversing vehicles
- Partnering with the Georgina Josephine Foundation to launch their inaugural National Low Speed Vehicle Run Over Prevention Awareness Day, and
- Updating the Motor Vehicle Operational Guidelines to require all government vehicles to have a range of safety features.

We note that fleet vehicles play an important role in influencing the new vehicle market and the broader Australian fleet once these vehicles enter the used car market. Governments that adopt a purchase policy of vehicles with a five-star safety rating can have a positive influence on road safety.<sup>85</sup>

78. Advanced driver-assistance systems (ADAS) are groups of electronic technologies that assist drivers in driving and parking functions. Examples of ADAS applications include adaptive cruise control and automatic parking. ADAS use automated technology, such as sensors and cameras, to detect nearby obstacles or driver errors, and respond accordingly.

79. Autonomous emergency braking (AEB) is an active system that activates a car's brakes when a potential collision is detected. AEB can also increase braking force if the driver is applying the brakes, but not enough to prevent a collision. All AEB systems detect vehicles, and many can sense pedestrians and cyclists.

80. Flides B, Keall M, Newstead S 2017. Backover Collisions and the Effectiveness of Reversing Cameras. 25th International Technical Conference on the Enhanced Safety of Vehicles (ESV). Accessed from <https://www-esv.nhtsa.dot.gov/Proceedings/25/25ESV-000250.pdf> on 4 May 2021.

81. Vehicles awarded a 5-star ANCAP rating may still not feature reverse safety features. The NSW Motor Vehicle Operations Guidelines therefore specifically require that vehicles feature reverse safety systems.

82. A utility vehicle is a truck or other vehicle designed for carrying small loads.

83. An SUV is a car classification that combines elements of road-going passenger vehicles with features from off-road vehicles.

84. Keall M, Budd L, Newstead S 2018. How well can drivers see pedestrians to avoid collisions? The relationship between vehicle visibility and pedestrian injury risk and the safety benefits of reversing technologies for the Australasian fleet. Monash University Accident Research Centre, Melbourne.

85. NRMA 2019. Look Up Keeping Pedestrians Safe Road Safety Series June 2019. Accessed at <https://www.mynrma.com.au/-/media/documents/advocacy/look-up-keeping-pedestrians-safe.pdf> on 11 May 2021.

## Older vehicles and young drivers

We have previously observed that the majority of deaths involved older, less safe vehicles.<sup>86</sup> This observation is consistent with information for child transport-related deaths in 2018 and 2019. We have also previously noted that the NSW Road Safety Strategy<sup>87</sup> identifies younger drivers are more likely to drive older, less safe vehicles. Of the nine young drivers aged 15-17 years who died in 2018 and 2019 while driving on a public road, all but one was driving a vehicle over 11 years old. Five of these young people lived in the most disadvantaged areas of the state.

## Quad bike safety

In 2018 and 2019, two children died in separate quad bike rollovers. The children were aged 10-14 years. One of the children was a passenger on an adult-sized vehicle driven by another child. The other child was the driver of an adult-sized quad bike. Both fatalities occurred off-road on private properties.

A third child aged 10-14 years died when the off-road buggy<sup>88</sup> they were riding in rolled over on a public road. The driver of this vehicle was an adult, and the vehicle should not have been on the roadway.

None of the children who died were using helmets or seatbelts.

### 6.2.9. Supervision

Children under the age of 10 are not physically or developmentally equipped to make the crucial decisions needed to keep themselves safe in a traffic environment.<sup>89</sup>

In 2018 and 2019, there were three pedestrian deaths involving children under 10 years. Two of the children were killed while attempting to cross a road unsupervised.

Five children died in low-speed vehicle run-over incidents in 2018 and 2019, including three children aged 1-4 years. The other two children were aged 5-9 years. The incidents occurred in driveways and other areas on private properties, and one in a public area.

In all but one circumstance supervision was considered a factor; either the level of supervision was not appropriate for the child's age and stage of development; a parent or carer was attending to other tasks; or both parents/carers assumed the other had responsibility for supervision.

## 6.3. Observations and Recommendations

Road traffic collisions are the leading cause of death of Australian children and young people and represent the most common cause of injury treated in hospital for children aged 15 years or less in NSW.<sup>90,91</sup> Speeding, alcohol and drug use, fatigue and driver distraction remain key contributing factors in transport-related deaths.<sup>92</sup> Other contributing factors include novice drivers, vehicles with fewer safety features,<sup>93</sup> and inappropriate use, or the lack of, a restraint.<sup>94</sup>

86. Biennial report of the deaths of children in New South Wales: 2016 and 2017. Incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

87. Transport for NSW 2012. NSW Road Safety Strategy 2012-2021. Transport for NSW, Sydney.

88. Polaris Ranger 4x4 Utility vehicle.

89. Schwebel D, Gaines J 2007. Pediatric unintentional injury: behavioral risk factors and implications for prevention. *Journal of Developmental & Behavioral Pediatrics* 28: 245-54.

90. Australian Institute of Health and Welfare 2020. Australia's children. Cat. No. CWS 69. Australian Institute of Health and Welfare, Canberra.

91. Mitchell RJ, Bambach MR, Foster K, Curtis K 2015. Risk factors associated with the severity of injury outcome for paediatric road trauma. *Injury*, 46(5), 874-882.

92. Ibid.

93. Walker C, Thompson J, Stevenson M 2017. Road trauma among young Australians: implementing policy to reduce road deaths and serious injury. *Traffic Injury Prevention*, 18(4), 363-8.

94. NSW Child Death Review Team 2019. The role of child restraints and seatbelts in passenger deaths of children aged 0-12 years in NSW. NSW Ombudsman, Sydney.

### 6.3.1. Unsafe driver behaviours remain the key contributing factor in transport crashes

In 2018 and 2019, unsafe driver behaviours such as speeding, alcohol and other drug use, reckless driving, and driver distraction were significant factors in transport incidents where a child or young person died.<sup>95</sup> Over half (53%, 28) of the 54 transport fatalities in the two-year period involved drivers exhibiting at least one of these unsafe driving behaviours. Consistent with other studies, young male drivers were more likely to display unsafe driver behaviours.<sup>96</sup>

### 6.3.2. More than half the at-fault drivers were novice drivers

The NSW Graduated Licensing Scheme, restrictions for learner and provisional (P-plate) drivers (e.g., speed and passenger limits, zero blood alcohol and mobile phone use), vehicle restrictions for P1 and P2 licence holders (e.g., bans from driving high-performance vehicles<sup>97</sup>), driver logbooks, and the promotion of safer driver courses are all measures put in place to build driver confidence and reduce the impact of risk-taking behaviour associated with young drivers.

Although the number of young drivers killed on NSW roads has halved since the introduction of the graduated licence scheme in 2000, age and inexperience are still major factors for transport fatalities. Of the 36 incidents where an at-fault driver was identified, more than half (20) were young people under 25 years, the majority of whom were learner and provisional licence holders.

The Safer Drivers Course<sup>98</sup> has been developed to help young drivers on their L-plates prepare for driving solo when they graduate to provisional licences. The course teaches learners how to reduce road risks by understanding more about safe driver behaviour. Completion of the course earns a learner 20 hours of logbook credit (reducing the total hours of supervised driving outside the course to 100 hours).

The course costs \$140 and is available in locations across NSW. The NSW Government is currently offering 1000 free places on the Safer Drivers Course each year to help young learner drivers from disadvantaged backgrounds and Aboriginal communities.

In February 2021, the Centre for Road Safety advised our office it will undertake an outcomes evaluation of the course to assess its effectiveness on novice driver safety. At the time of writing, this evaluation has been postponed to provide an opportunity for more crash data to be collected to inform the evaluation.

### 6.3.3. Seatbelts and child restraints can prevent deaths of children in vehicle crashes

The lack of a seatbelt or child restraint, use of an age-inappropriate restraint, or use of an incorrectly fitted restraint was a factor in the deaths of twelve child passengers in 2018-2019.

In our 2019 report, *The role of child restraints and seatbelts in passenger deaths of children aged 0-12 years in NSW*, we made four recommendations to Transport for NSW to address the issues identified in our review – all of which were supported.<sup>99</sup> Transport for NSW has taken steps to implement the recommendations, including engaging Neuroscience Australia (NeuRA) to conduct a study of child

95. Transport for NSW Centre for Road Safety 2021. Get your hand off it. Accessed from <https://roadsafety.transport.nsw.gov.au/campaigns/get-your-hand-off-it/index.html> on 27 February 2021.

96. Transport for NSW Centre for Road Safety 2021. Fatigue. Accessed from <https://roadsafety.transport.nsw.gov.au/stayingsafe/fatigue/index.html> on 27 February 2021.

97. High performance vehicles are those which have a high power-mass ratio, have been modified, or where there is other data suggesting that they are a high risk for novice drivers.

98. Transport for NSW Centre for Road Safety 2021. Safer drivers course. Accessed from <https://roadsafety.transport.nsw.gov.au/stayingsafe/drivers/youngdrivers/youngerdriverscourse.html> on 27 February 2021.

99. NSW Child Death Review Team 2019. The role of child restraints and seatbelts in passenger deaths of children aged 0-12 years in NSW. NSW Ombudsman, Sydney.

restraint practices in NSW that focuses on areas of socio-economic disadvantage and outside of major cities. Since then, NeuRA's report has been finalised, but was not able to be fully completed due to disruptions caused by bushfires and COVID-19 restrictions. TfNSW has advised it was not possible to resume the survey because too much time had passed in between data collection time points. We will, however, continue to actively monitor the implementation of all the recommendations made in our 2019 report in the coming months.

### Creative response to local community needs

In 2019, NSW Police launched a child vehicle restraint program in Sydney's west to assist vulnerable families to ensure they have the correct seats for their children and the training to put the restraints in place in the vehicle.

The initiative was originally the idea of Inspector Gregory Donaldson of Macarthur Police Local Area Command, who read our study of child passenger deaths and noted the children most at risk were Aboriginal children, children in rural areas and children from low socio-economic backgrounds. Inspector Donaldson realised that providing low-income families with access to the right equipment, and training parents to use child restraints and seatbelts properly, would greatly increase the likelihood of a child surviving if they were involved in a collision.

The program began with police from Mount Druitt Police Local Area Command working with community groups and local councils to reach out to vulnerable families to ensure they had access to a correct child restraint which was installed professionally, and that they were trained in fitting and using the seat properly. After proving a success in Sydney's west, in 2020 the program was launched in western NSW and far west NSW and then in the state's southwest. In March 2021, state-wide rollout of the program began.

The program is now partnered with Kidsafe NSW and provides accredited child restraint training to designated police officers, health workers and community transport workers, many of whom are the only people in regional communities with the knowledge to provide this advice. Vulnerable families are provided with a new, compliant car seat and are trained to install and use it correctly. The program currently relies on donations from community groups and private organisations and negotiations are underway for Transport for NSW to provide additional funding.

In addition to this program, NSW Police, in consultation with Revenue NSW's Hardship Support Program and Transport for NSW, is developing a diversion scheme which will be trialled in Sydney's southwest in June 2021. The scheme aims to provide those drivers who would otherwise receive a fine when a child is not properly restrained with an option to obtain a compliant restraint and have the restraint fitted by an authorised installer. The driver would then be given a caution in lieu of a fine. If successful, this scheme will be trialled in selected areas across NSW before being rolled out across the state.

We commend this initiative.

### 6.3.4. Quad bikes are inherently dangerous for children

Each year, on average between one and two children under 16 years die in quad bike crashes on private property in NSW. We have previously reported our view that all-terrain vehicles are inherently dangerous for children.<sup>100</sup>

In the two-year period, three children aged 10-14 years died while riding on or driving adult quad bikes or off-road buggies.

100. NSW Child Death Review Team 2019. Biennial report of the deaths of children in NSW in 2016 and 2017, incorporating reviewable deaths of children. NSW Ombudsman, Sydney.



There is currently no legislative prohibition in NSW that applies to the use of quad bikes on private properties, such as farms, by children under 16 years of age. Quad bikes and other off-road buggies are inherently dangerous. They are often involved in rollovers, collisions, and incidents where a driver or passenger falls from the vehicle. Key risks are:

- They have a high centre of gravity that is worse when turning
- They have poor visibility to the ground and can hit hidden obstacles
- They can be overloaded with excessive weight
- Children using these vehicles may be inexperienced or less able to assess risk.<sup>101</sup>

The CDRT has previously recommended that the NSW Attorney General refer to the NSW Law Reform Commission to review the introduction of legislation to prohibit any child under 16 years of age from using an adult sized quad bike or side-by-side vehicle on private property or in recreational vehicle areas.<sup>102</sup> This recommendation was not accepted.

In June 2019, in the context of the NSW Government's decision not to adopt our proposal, we recommended that SafeWork NSW strongly promote the message that children under 16 years of age should not operate, or be a passenger on, adult quad bikes under any circumstances, through the government's *Quad Bike Safety Improvement Program*.

SafeWork supported the recommendation and took steps to feature this message in its 2020 child safety campaign, on its website and social channels, and at agricultural field days. The 2020 campaign featured the message that '*It's not worth your child's life. Just say no to them riding adult quad bikes*'. The campaign also included a warning to quad bike owners to '*keep kids off quad bikes*' during the school holidays, information about why quad bikes are so dangerous, and the story of one family whose daughter was killed in 2017.<sup>103</sup>

In October 2019, the NSW Government announced a new quad bike standard which will apply to all new quad bikes and imported second-hand quad bikes. The requirements set out in the standard are intended to prevent or reduce the risk of fatality or injury associated with the use of quad bikes. On or after 11 October 2020, all quad bikes are required to:

- Have a clearly visible and legible fixed rollover warning label
- Provide information in the owner's manual or information handbook on the risk of rollover
- Meet the specified requirements of the US or European Standard for quad bikes
- Be tested for stability and display the angle at which the quad bike tips onto two wheels on a hang tag at the point of sale.

In addition, on or after 11 October 2021, general use quad bikes are required to meet the minimum stability requirements of lateral roll stability and front and rear longitudinal pitch stability. The quad bike must also be fitted with an operator protection device or have one integrated into its design.

The new standard is a step in the right direction. However, it remains the view of the CDRT that legislation to prohibit children under 16 years of age from using adult quad bikes or side-by-side vehicles under any circumstances is a necessary step to prevent further deaths of children in these circumstances.

### 6.3.5. The majority of deaths involved older, less safe vehicles

Consistent with findings from previous years, most of the children who died in transport-related incidents were travelling in older vehicles more than 10 years old. Newer vehicle models include modern safety technologies and features such as improved car structure, enhanced seatbelt technology, reversing cameras, and airbags.<sup>104</sup>

101. Road Safety NT 2021. Accessed from <https://roadsafety.nt.gov.au/safety-topics/all-terrain-vehicles/hazards-and-risks-involved> on 11 May 2021.

102. NSW Child Death Review Team 2016. Child Death Review Team Report 2015. NSW Ombudsman, Sydney

103. SafeWork NSW 2020. Keep kids off quad bikes during school holidays. Accessed from <https://www.safework.nsw.gov.au/news/safework-media-releases/keep-kids-off-quad-bikes-during-school-holidays> on 5 March 2021.

104. Anderson RWG, Raftery S, Grigo J, Hutchinson TP 2013. Access to safer vehicle technologies by young drivers: factors affecting motor vehicle choice and effects on crashes. CASR Report Series CASR118. University of Adelaide, Centre for Automotive Safety Research, Adelaide.

In June 2019, we recommended that the Centre for Road Safety create a webpage targeted at young drivers looking to buy a vehicle that included information to assist young people purchase the safest car in a range of price brackets. Transport for NSW supported the recommendation; however, as at August 2020, it had not been implemented. In response to a draft copy of this report, Transport for NSW advised that the Centre for Road Safety has been working with ANCAP and the Vehicle Safety Research Group to develop a website that will allow consumers to search vehicles within a price range, providing the most appropriate safety rating for that vehicle. Noting this advice, we recommend:

**Transport for NSW (Centre for Road Safety) include in its proposed website to allow consumers to search vehicles within a price range and by safety rating, a page targeted at young drivers. The website should be promoted directly to young drivers through a focused campaign.**



## 7. Drowning

In 2018 and 2019, 12 infants and children drowned in NSW.

The mortality rate from drowning has gradually declined over the past 15 years, however there is considerable variability across years.

Drowning remains the leading cause of unintentional injury-related death for children aged 1-4 years in NSW. Males were twice as likely as females to drown.

Trends in drowning deaths vary by age and location. For children less than five years of age, most drownings occurred in private swimming pools. For children aged five years and above, most incidents occurred in natural bodies of water such as beaches, rivers, and lakes.

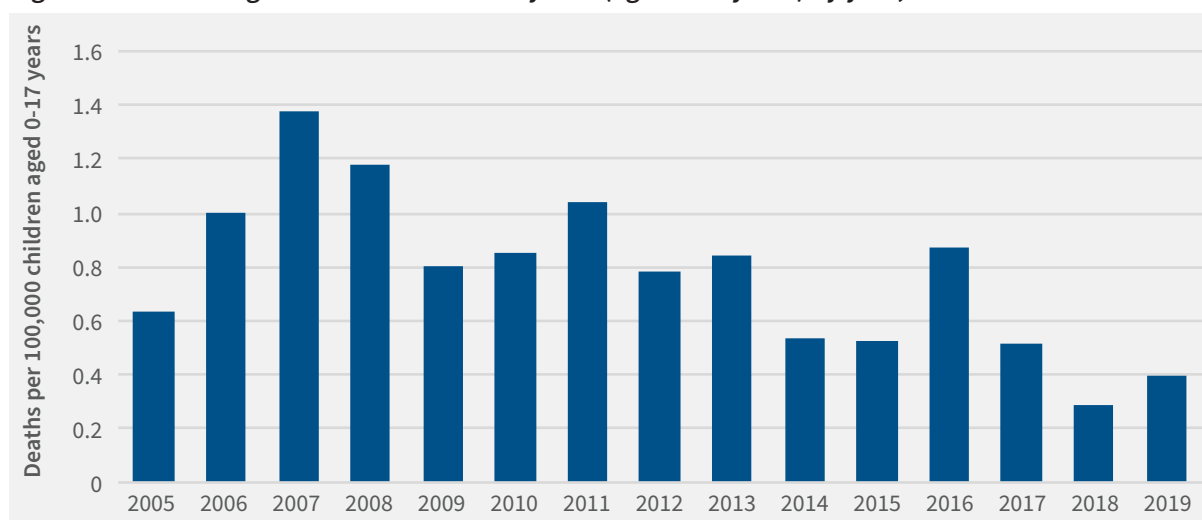
### 7.1. Drowning in 2018-2019, and trends

This chapter examines the drowning deaths of 12 infants and children in NSW in 2018 and 2019. The 12 deaths reflect a child mortality rate of 0.3 deaths per 100,000 children.

Over the 15 years 2005-2019, the rate of drowning among infants and children significantly decreased from a peak of 1.4 to 0.4 deaths per 100,000 children. However, there has been considerable variability in the rate over the years.

While the number of young children who drown in NSW each year is relatively low, drowning deaths are preventable.

**Figure 44. Drowning-related child mortality rate (aged 0-17 years) by year, NSW 2005-2019**



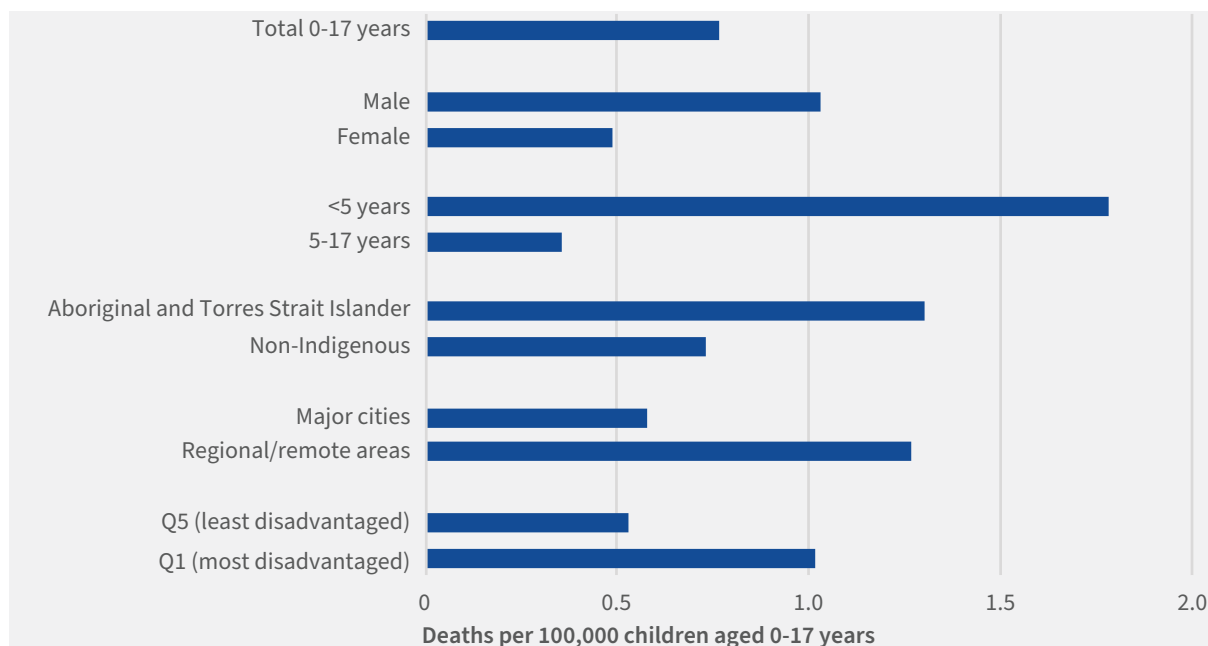
#### 7.1.1. Drowning deaths by demographics

Seven of the 12 children who drowned were less than five years old. This has been a consistent pattern across the years and reflects the high level of risk posed by unimpeded and/or unsupervised access to water for very young children. Of the 192 drowning deaths of children in the 15 years to 2019, two-thirds were among children aged less than five years, with little change over this period.

Of the 12 children, eight were male and four were female. Over the 15 years to 2019, the drowning mortality rate for male children was 2.1 times higher than for female children.

Five of the children lived in regional and remote parts of NSW.<sup>105</sup> Again, this is consistent with the pattern over time which shows that the drowning mortality rate for children living in regional and remote parts of NSW was at least two times higher than for children living major cities.

**Figure 45. Drowning-related child mortality rate (aged 0-17 years) by demographics, NSW 2005-2019**



### 7.1.2. Location of drowning by age of children

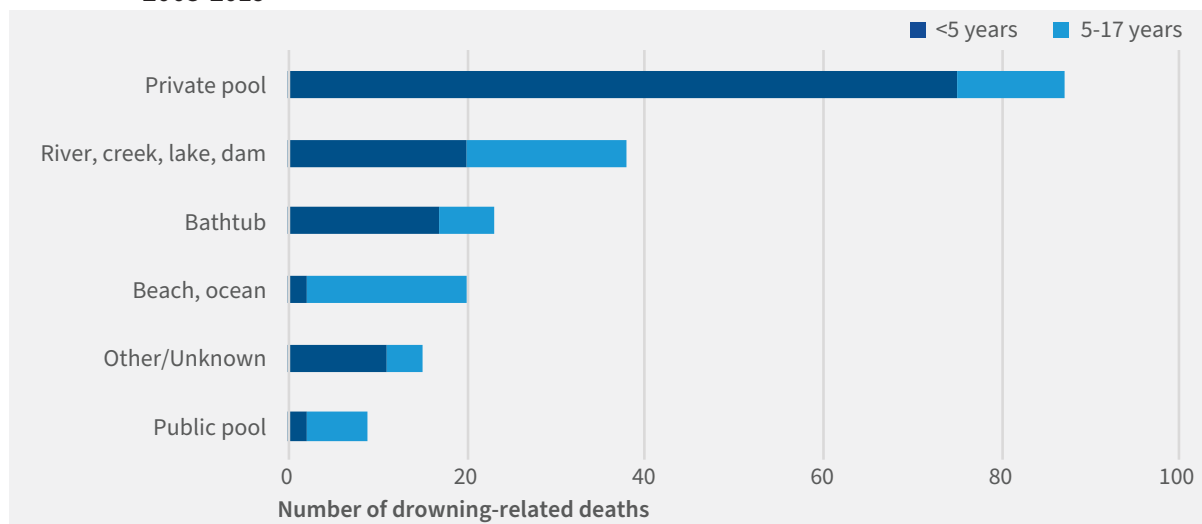
The location of drowning fatalities varies with the age of the child. Children younger than five years are more likely to drown in a swimming pool, whereas older children are more likely to drown in a natural body of water. In 2018 and 2019:

- Four children drowned in swimming pools – all but one was aged less than five years
- Three children drowned in bathtubs, including an infant under one year
- Two children under five years of age drowned in natural bodies of water – one child fell from a boat in a river and one child drowned in a dam on a rural property
- Three children and young people aged 10-17 years drowned in natural bodies of water, including a lake and coastal waters.

Over the past 15 years, most drowning deaths involved children less than five years of age and occurred in private swimming pools. For children aged 5-17 years, most deaths occurred in natural bodies of water.

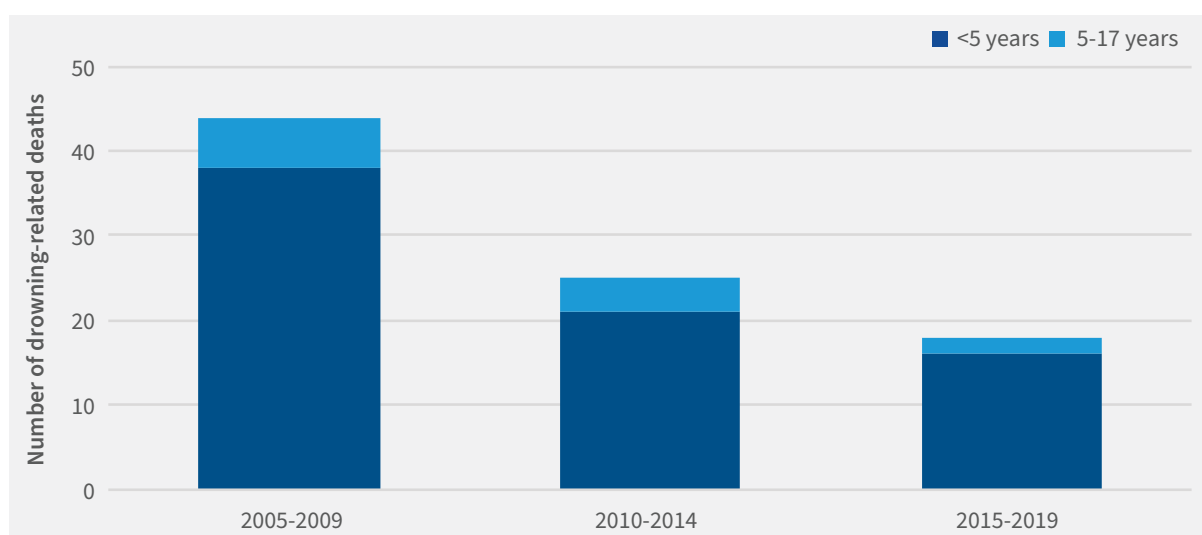
105. One of the children who drowned was normally resident overseas so was not included in the remoteness or socio-economic status data items.

**Figure 46. Number of drowning-related deaths among children by location and age group, NSW 2005-2019**



While noting that most child drownings occur in private swimming pools, the overall number of drowning deaths in private swimming pools has declined over the past 15 years.

**Figure 47. Number of drowning-related deaths in private swimming pools by age group, NSW 2005-2019**



## 7.2. Factors identified for drowning-related deaths, 2018-2019

As noted above, and consistent with previous years, most (7) of the 12 children who drowned were less than five years of age. For young children, our reviews have shown that a drowning death often occurs following a chain of events – a faulty pool gate left unsecured, carer distraction with household chores or attending to other children, unclear delegation for supervision and the child able to leave the house unseen. Our reviews have highlighted the critical link between lack of direct supervision of young children, even for very short periods of time, and inadequate (faulty or absent) child resistant barriers.

For the children under five years who drowned in the 2018 and 2019, and as has consistently been the case, the combination of insufficient adult supervision and access to water were key factors.

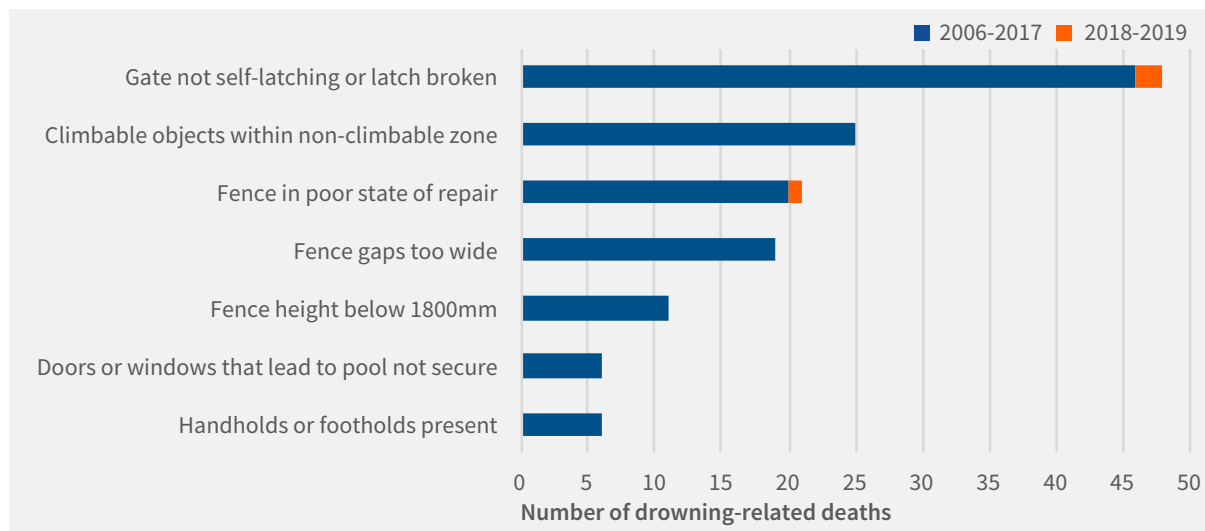
For the older children and young people other factors came into play, such as a lack of experience in assessing or paying heed to danger.

## 7.2.1. Swimming pools

### Private swimming pools

For the three children who drowned in backyard swimming pools, the pool was accessible to the child at the same time as the child was unsupervised. The issues noted in the current two-year period are consistent with barrier issues identified in our reviews over time – the most frequently observed issues were problems with the swimming pool gate (not self-latching or latch broken), insecure fencing allowing access, and presence of climbable objects in the vicinity of pool fences.

Figure 48. Issues identified in private swimming pool barriers, NSW 2006-2017 vs 2018-2019



### Public swimming pools

One child drowned at a public swimming pool in the current two-year period. This matter remains open with the Coroner.

Over the 15-years to 2019, nine children have drowned in public swimming pools in NSW. Most of the children were non or weak swimmers, and in all but two instances, supervision issues were identified as contributing to the circumstances. In general, the children drowned due to a combination of poor swimming ability and lack of supervision appropriate to their age and skill level. Two children drowned in the context of medical episodes while swimming.

Royal Lifesaving Australia recommends:<sup>106</sup>

- for children aged 0-5 years, parents and carers should stay within arms' reach
- for children aged 6-10 years and or older children who are weak swimmers, parents should be close, prepared and maintain constant visual contact, and
- for children aged 11-14 years, parents should maintain visual contact.

## 7.2.2. Bathtub drowning

In 2018 and 2019, three children drowned in bathtubs. Two were very young children who drowned while unsupervised for a short time and one older child was rendered unconscious in the bath after slipping.

Over the 15 years to 2019, 23 children aged 0-17 years drowned in bathtubs. Most (17) bathtub drownings involved young children less than five years, including infants (11) and those aged 1-4 years (6), emphasising the importance of close and constant supervision of very young children. The circumstances of older children who drown in a bathtub are most often related to a medical condition or recent illness that may be linked to a risk of temporary loss of consciousness.

106. Royal Life Saving Australia 2021. Keep watch at public pools. Accessed from <https://www.royallifesaving.com.au/Aquatic-Risk-and-Guidelines/safety-programs/child-supervision/keep-watch-at-public-pools> on 28 March 2021.

Prevention measures include constant and arms-length supervision of young children, restricting access to bathtubs without supervision, having everything ready for bathing before entering the bathroom, and once finished leaving the bathroom with taps turned off, plug removed, bathtub drained, and door closed.

### 7.2.3. Dams and other inland waterways

In 2018 and 2019, one child drowned in a dam on a rural property. Over the past 15 years, seven children have drowned in dams, and half (4) were children under five years of age. SafeWork NSW's *Child safety on farms: fact sheet*<sup>107</sup> recommends having a securely fenced play area for children, active supervision, and where possible, fencing of water hazards. An additional 31 drowning deaths – including 16 children aged under five years – occurred over the 15 years in natural bodies of water such as creeks, rivers, and lakes.

A recent national study assessing factors in fatal farm incidents involving children over the period 2001-2019 found no change in the fatality rate for farm-related child injury deaths across Australia, and that children aged 0-4 years were significantly more likely to be involved in these incidents.<sup>108</sup> Water bodies (such as dams) were responsible for over 31% of deaths.

## 7.3. Observations and Recommendations

Drowning is a leading cause of death for children aged 0-4 years in Australia. It also results in a significant economic burden on the community of over \$1.2 billion annually.<sup>109, 110</sup> This finding is consistent with NSW where children under the age of five were identified as being at the highest risk of drowning deaths over the 2002-2017 period, with private swimming pools the leading drowning location.<sup>111</sup> Though the rate of fatal drowning among children has significantly decreased over the past 15 years (2005-2019), recent research has highlighted that the rate of non-fatal drowning in children has been increasing in Australia.<sup>112 113</sup>

Our reviews of these deaths have consistently highlighted the need for vigilance by parents and carers to keep their children safe when in, on or around water. Primary factors for fatal child drowning include lack of active adult supervision and unrestricted access to water.

Royal Life Saving's *Keep Watch* drowning prevention program asks parents to:<sup>114</sup>

- Supervise (close, constant, focused)
- Restrict (access, fence/gate, maintain)
- Teach (water awareness, familiarise, develop, educate), and
- Respond (resuscitation, learn, update, act).

107. SafeWork NSW 2021. Child safety on farms: fact sheet. Accessed from <https://www.safework.nsw.gov.au/resource-library/agriculture,-forestry-and-fishing-publications/quad-bike-pubs/child-safety-on-farms-fact-sheet> on 28 March 2021.

108. Peachey K, Lower T, Rolfe M 2020. Protecting the future: Fatal incidents on Australian farms involving children (2001-2019). *The Australian Journal of Rural Health*, 28(4), 385-93.

109. Australian Institute of Health and Welfare 2020. Australia's children. Cat. No. CWS 69. Australian Institute of Health and Welfare, Canberra.

110. Barnsley PD, Peden AE, Scarr J 2018. Calculating the economic burden of fatal drowning in Australia. *Journal of Safety Research*, 67, 57-63.

111. Mahony A, Peden AE 2017. NSW child drowning report: a 15-year analysis of causal factors for drowning of children under 5 years in private swimming pools 2002/03-2016/17. Royal Life Saving Society Australia, Sydney.

112. Peden AE, Mahony AJ, Barnsley PD, Scarr J 2018. Understanding the full burden of drowning: a retrospective, cross-sectional analysis of fatal and non-fatal drowning in Australia. *BMJ Open*, 8: e024868.

113. Mahony A, Barnsley P, Peden AE, Scarr J 2017. A thirteen year national study of non-fatal drowning in Australia: data challenges, hidden impacts and social costs. Royal Life Savings Society Australia, Sydney.

114. Royal Life Saving Australia 2020. Keep watch. Accessed from <https://www.royallifesaving.com.au/old/families/at-home/toddler-drowning-prevention> on 20 November 2020.

### 7.3.1. Compliance with child safety barrier fencing requirements is essential

Only one of the three private pools in which children drowned in 2018 and 2019 was compliant with the barrier fencing requirements prescribed by the *Swimming Pools Act 1992*.<sup>115</sup> In that case, the pool gate was propped open and accessible to the child.

Over the five years 2015-2019, 18 children drowned in private swimming pools in NSW. Our reviews identified barrier issues in most (15) of these cases.

Pool inspection and compliance with legislation is managed within local government areas. The *Swimming Pools Regulation 2018* requires local councils to report publicly on the number of inspections carried out, the proportion that were deemed non-compliant with legislation, details of the defects identified, and whether or not owners have rectified defects within a reasonable period of time.

In 2016, we recommended that the (then) Office of Local Government (OLG) should publish annual data on key aspects of swimming pool regulation, including but not limited to:

- The number of pools registered
- The number of pools that have been inspected
- The proportion of inspected swimming pools that were deemed non-compliant with the [Swimming Pools] Act at the time of inspection
- The main defects identified at the time of inspection, and
- Whether or not owners have rectified defects within a reasonable period of time.<sup>116</sup>

The recommendation was supported by the OLG. While some information about swimming pool safety and inspection is published in annual reports of local councils and the Building Professionals Board, the information that is currently published is not comprehensive or consistently provided by each council.

The Swimming Pool Register is currently managed by NSW Fair Trading within the Department of Customer Service (DCS). The DCS has advised us (most recently in June 2020) that the Swimming Pool Register cannot currently provide an amalgamated report of the reasons pool barriers fail inspections, and whether non-compliances were rectified by owners within reasonable timeframes. Planned upgrades to the Register are required and will not be available until 2021. We are continuing to monitor this issue and report on the extent of publicly accessible data on the effectiveness of the regulatory regime.

Considering this advice, we recommend that:

**The Department of Customer Service, in its planned upgrade of the Swimming Pool Register, ensure its collection and reporting capability allows for public amalgamated reporting of compliance data relating to the key aspects of swimming pool regulation, including the reasons pools barriers fail inspections, and whether non-compliances were rectified by owners within reasonable timeframes.**

115. NSW Government 1992. *Swimming Pools Act 1992*. Accessed from <https://www.legislation.nsw.gov.au/view/whole/html/inforce/current/act-1992-049>, on 20 November 2020.

116. NSW Child Death Review Team (2016). *Child death review report 2015*, NSW Ombudsman, Sydney.

## 8. Other unintentional injury

In 2018 and 2019, 29 infants and children died from unintentional injuries other than drowning and transport-related injury – poisoning, falls, fire, and threats to breathing.

Many of these deaths were preventable.

Risks for younger children under five years of age include inadequate supervision and access to hazards. Risks associated with fatalities for older children and teenagers include alcohol and drug use, and risk-taking behaviours.

### 8.1. Other unintentional injury-related deaths in 2018-2019, and trends

In 2018 and 2019, 29 infants and children died from unintentional injury-related causes other than drowning and transport related injury:

- Sixteen children died as a result of asphyxia. Four of the children were infants who died in unsafe sleep environments. Four children choked on food or other objects – all were aged between one and four years of age. Four children aged between seven and 14 years were accidentally strangled or suffocated, including three children who placed items around their necks.
- Seven children died from poisoning. This included four children who accessed and ingested toxic substances or medication prescribed for adult family members. Three young people aged 15-17 years died from poisoning associated with illicit drug or alcohol toxicity or inhalation of a noxious substance.
- Falls accounted for the deaths of five children, and three children were accidentally struck by an object.
- Two children died after being left or trapped in parked vehicles.

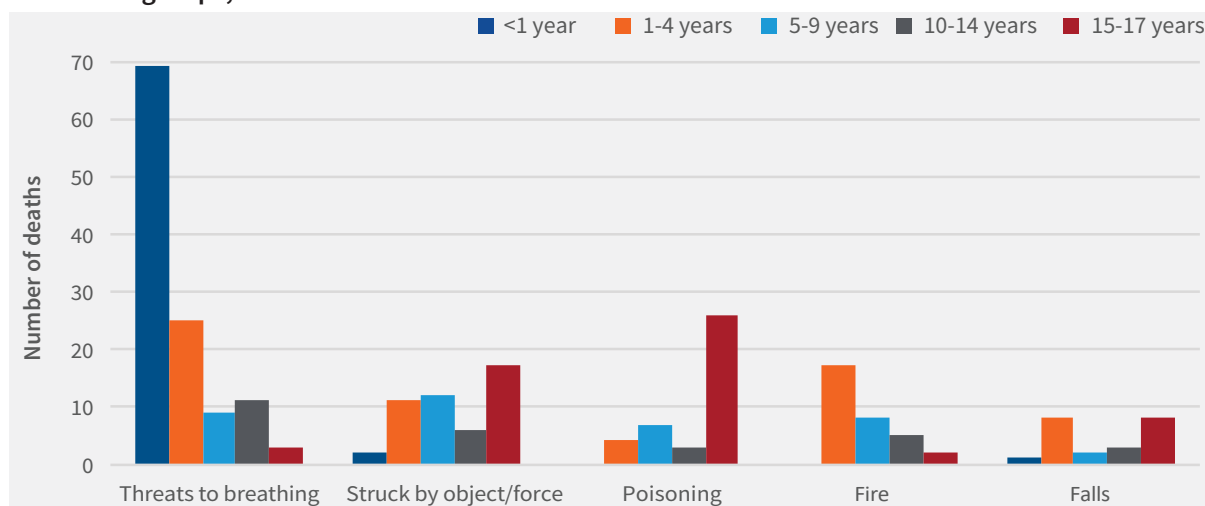
Nearly half (12 of 29) of the infants and children had a child protection history, and in almost all instances (10) the family was the subject of a report screened as meeting the ROSH threshold.

The deaths of two children were reviewable by the Ombudsman, including one death related to neglect and the other involving a child in care.

#### 8.1.1. Other unintentional injury-related deaths by cause of death

The most common causes of accidental childhood injury that result in death (excluding transport and drowning-related causes) are shown in the figure below. Although there has been some variability over the years, the number of children who died from some of these causes has decreased. For example, fire-related deaths declined from 20 in 2005-2009 to four in 2015-2019.

Figure 49. Number of other unintentional injury-related child deaths by key causes of death and age groups, NSW 2005-2019



## 8.2. Factors identified in unintentional injury-related deaths, 2018-2019

Risk factors associated with unintentional injury vary according to the child's age and developmental stage, as well as the specific environment, circumstances, and/or type of hazard.

For infants less than one year, risks are primarily associated with a safe sleeping environment. These deaths are discussed in more detail in Chapter 4.

For children aged 1-4 years, particular risks include lack of supervision and access to hazards.

For older children – those aged 5-9 years and 10-14 years – other factors come into play due to their increasing engagement in the physical environment and relative lack of experience in assessing danger.

For young people aged 15-17, issues such as risk-taking behaviour and misjudgement of hazards come into play. A particular risk is use of alcohol or illicit drugs, with preventable deaths associated with poisoning or from causes linked to their level of intoxication and ability to judge risk.

### 8.2.1. Lack of active supervision

In 2018 and 2019, inadequate or lapsed supervision was identified as a factor in six unintentional injury-related deaths other than transport and drowning. All the children were aged 1-7 years. Our reviews identified issues such as miscommunication between adults about the whereabouts of children and assumptions about what children were doing, contributed to a lack of active supervision.

### 8.2.2. Risk-taking

A death is considered to have occurred in the context of risk-taking if the child or young person was involved in an activity or behaviour in the period immediately preceding their death that posed a significant foreseeable risk to their safety.

Risk-taking was identified as a factor in more than one quarter (8) of the 29 unintentional injury deaths (other than transport and drowning fatalities, which are discussed separately):

- Three young people aged 15-17 years died from poisoning associated with illicit drug or alcohol use. One young person placed themselves in a dangerous environment while intoxicated and was struck by a moving object.
- Two older children fell from heights; one in the context of illicit drug use.
- Two children aged 10-14 years were accidentally strangled after placing things around their necks.

Alcohol, illicit drug, or substance misuse was a factor in many of these deaths. Older children and young people are more likely to engage in risk-taking behaviours that make them vulnerable to harm. Taking risks is part of normal adolescent development and the transition to adulthood. However, some risk-taking, and a lack of experience in assessing and judging potential consequences of risk, can place the young person at risk of serious harm.



## 9. Suicide

In 2018 and 2019, 51 children and young people aged 10-17 years died by suicide. Most of these deaths were young people aged 15-17 years.

Unlike other causes and circumstances of death, the suicide rate among young people has increased over the 15 years to 2019.

Aboriginal and Torres Strait Islander children and young people have a much higher rate of suicide than non-Indigenous children and young people.

More young males than females die by suicide, and this gender gap increased in the last five years.

Children and young people residing in regional and remote areas, and those living in the most disadvantaged areas of NSW were over-represented in suicide deaths.

### 9.1. Suicide deaths among young people in 2018-2019, and trends

This chapter examines the deaths of 51 children and young people aged 10-17 years who died by suicide in 2018 and 2019. These 51 deaths reflected a mortality rate of 3.4 deaths per 100,000 children aged 10-17 years in NSW.

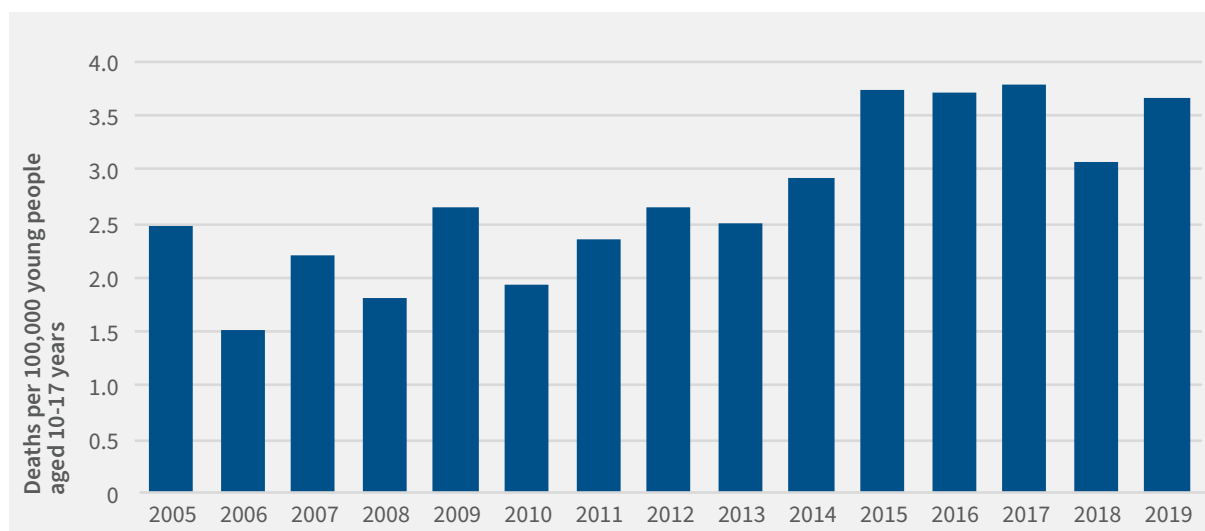
Our data includes deaths where:

- the Coroner made a finding that the cause and manner of death was self-harm with fatal intent
- police identified the death as suicide and the case remains open with the Coroner
- the Coroner dispensed with an inquest and has not made a finding about the manner of death, but police identified the death as suicide and records examined provide evidence of self-harm with fatal intent.

In 2018 and 2019, the suicide deaths of two young people were reviewable by the Ombudsman because they were in the care of the state or a service provider. Over the 10-year period 2010-2019, the suicide deaths of nine young people were reviewable because they were in care at the time of their death.

The rate of suicide among children and young people aged 10-17 years has significantly increased over the 15-year period 2005-2019, from 2.5 deaths per 100,000 children in 2005 to 3.7 deaths per 100,000 children in 2019.

Figure 50. Suicide rate among young people (aged 10-17 years) by year, NSW 2005-2019



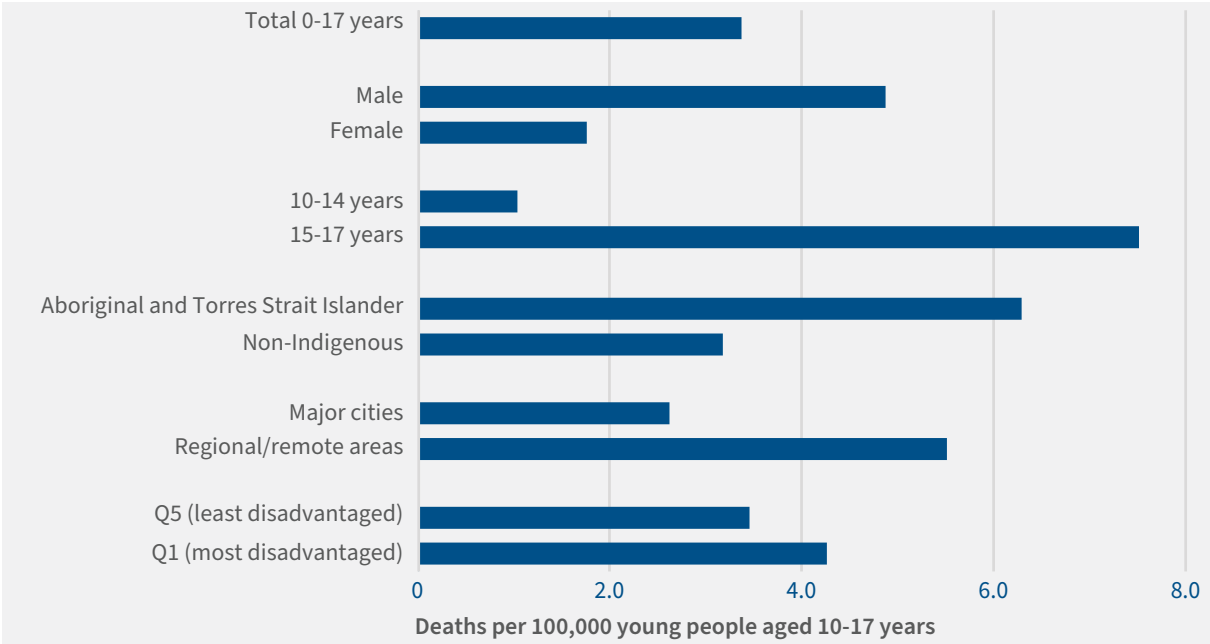
### 9.1.1. Suicide among young people by demographics

In 2018 and 2019, males accounted for three-quarters (75%, 38) of the 51 suicide deaths. Between 2005 and 2019, the suicide rate for males aged 10-17 years increased significantly, from 3.0 deaths per 100,000 in 2005-2009 to 4.9 deaths per 100,000 in 2015-2019.

The majority (80%, 41) of the children and young people who died by suicide in 2018 and 2019 were aged 15-17 years. Over the 15-year period to 2019, suicide rates for young people aged 15-17 years increased significantly from 4.8 deaths per 100,000 in 2005-2009 to 7.8 deaths per 100,000 in 2015-2019.

Consistent with other causes of death, young people of Aboriginal and Torres Strait Islander background, those residing in regional and remote areas, and those living in the most disadvantaged areas of NSW were over-represented in suicide deaths in 2018 and 2019 and were found to have significantly increased suicide rates over the 15-year period.

**Figure 51. Suicide rate among young people (aged 10-17 years) by demographics, NSW 2018-2019**



### 9.1.2. Suicide among young people by child protection history

In 2018 and 2019, 22 of the 51 (43%) young people who died by suicide were from families with a child protection history. More than half (14) of these young people were the subject of a risk of significant harm (ROSH) report, including – for seven young people – reports of risk associated with self-harm or suicide. The other eight young people known to child protection authorities were the subject of reports screened as non-ROSH (5) or reports to a Child Wellbeing Unit (3).<sup>117</sup>

Children and young people with a child protection history have been consistently over-represented among suicide deaths across the 15 years to 2019. For comparison, in our report on the deaths of children with a child protection history from 2002-2011, 20% of children aged 0-17 years for any cause of death had a child protection history.<sup>118</sup>

117. Child Wellbeing Units are established within NSW Health, the Department of Education and NSW Police Force to assist and support mandatory reporters to meet their legal obligations in responding to concerns about the safety, welfare and wellbeing of children and young people. Department of Communities and Justice 2021. Accessed from <https://www.facs.nsw.gov.au/providers/children-families/interagency-guidelines/understanding-roles-and-responsibilities-in-the-sector/chapters/child-wellbeing-units> on 19 May 2021.

118. NSW Child Death Review Team 2014. Causes of death of children with a child protection history 2002-2011. NSW Ombudsman, Sydney.

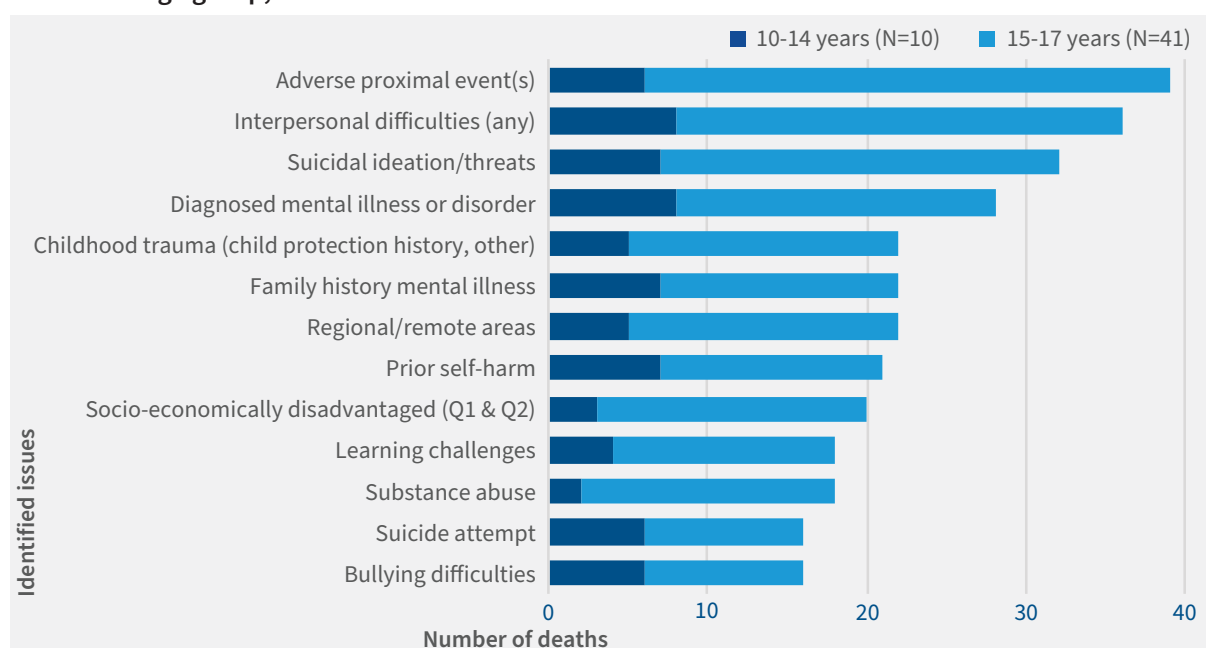
## 9.2. Factors identified for suicide among young people, 2018-2019

No single factor or combination of factors predicts suicide, and there are a range of individual, family, school and peer factors, and other demographic factors that are associated with suicide risk.

Nor are these risk and demographic factors specific to suicide. Some – for example family discord, school and peer-related problems, and substance abuse – are experienced by many young people. Exposure to these factors does not mean a young person will consider, or attempt, suicide. Protective factors against suicidal thoughts and behaviour can include strong family relationships, access to interventions and support, personal resilience and skills in problem solving.

For the 51 young people aged 10-17 years who died by suicide in 2018 and 2019, the most frequently identified circumstances for the young people prior to their death included adverse proximal events, interpersonal difficulties, and suicide ideation/threats. The figure below details the range of factors identified in reviews of the deaths of the 51 young people by age group.

**Figure 52. Number of suicide deaths among young people (aged 10-17 years) by selected factors and age group, NSW 2018-2019**



### 9.2.1. Individual risk factors

Individual issues and experiences associated with suicide include psychiatric disorders, substance abuse, adverse events, and previous self-harm or suicidal behaviour.<sup>119 120</sup> In this report the term ‘suicidal behaviour’ encompasses suicidal ideation and thoughts, suicidal plans, and suicide attempts. One or more of these factors were evident for 50 of the 51 young people who died by suicide in 2018 and 2019.

- **Adverse events and interpersonal difficulties:** Adverse proximal events refer to stressful or traumatic events that may occur close to a suicide. Proximal events are often associated with a significant experience, for example, a significant anniversary, a relationship breakdown, an altercation with family or intimate partner, or suspension or expulsion from school. Interpersonal difficulties include problems such as bullying, relationship breakdown, interpersonal conflict, and self-esteem/body image issues.

119. Bridge J, Goldstein T, Brent D 2006. Adolescent suicide and suicidal behavior. *Journal of Child Psychology and Psychiatry* 47, 372-94.

120. Hawton K, Saunders K, O'Connor R 2012. Self-harm and suicide in adolescents. *Lancet* 379, 2373-82.

The majority (45) of young people had experienced an adverse proximal event and/or interpersonal difficulties – in many cases both – before their suicide. The most common adverse events were an altercation with family or a girlfriend/boyfriend, and/or a relationship break-up. Other events included sexual or physical assault, being the victim or perpetrator of bullying, adverse involvement with police, and suspension from school. Almost one-quarter of the young people had been exposed to suicidal behaviour by another person, or a suicide death, with most experiencing this suicidality among family members.

- **Mental illness:** Just over half (28) of the young people had a diagnosed mental illness. Depression and anxiety were the most frequently diagnosed mental illnesses, with 25 of these young people having a diagnosis of depression or anxiety or both. Of these, nine were taking medication at the time of their death and two young people had ceased taking their medication in the weeks prior to their death. Eight other young people were recorded as having emerging signs of mental illness that were identified by family members or friends during post-death investigations or were documented in records in some circumstances. Most (25) of these young people also experienced interpersonal difficulties and/or an adverse proximal event and over half (16) had a family member (or members) with a history of mental illness.
- **Previous suicide ideation, threats, and attempts and non-suicidal self-harm:** More than two-thirds (38) of the young people had a history of suicide ideation (28), threats (12), suicide attempt (16) or non-suicidal self-harm (21). Of the young people who previously attempted suicide, most engaged in ideation, threats, or non-suicidal self-harm.
- **Substance abuse:** Research supports the existence of an association between suicide and substance abuse.<sup>121</sup> Just over one-third (18) of the young people had a documented substance abuse problem. Over half of those 18 young people (11) also had a diagnosed mental illness and all but one of these young people were aged 15-17 years. Once co-occurring mental health and alcohol and other drug problems have been established, the relationship between them is generally one of mutual influence – with each condition serving to perpetuate and exacerbate the other.<sup>122, 123</sup>

### 9.2.2. Family factors

Family factors that have been associated with youth suicide include family breakdown or poor family cohesion, parent-child conflicts and poor communication, a family history of mental illness or suicidal behaviour, unstable living arrangements, and adverse and traumatic events in childhood.<sup>124, 125</sup>

Over half (30) of the young people who died by suicide in 2018 and 2019 had at least one family factor, including a family history of mental illness (22), and other factors such as domestic violence, parent-child conflict and/or childhood trauma or abuse. All these young people also had at least one other individual factor such as a mental illness, prior suicide or self-harming behaviour, or a proximal event and/or interpersonal difficulties.

### 9.2.3. School, employment, and peer-related factors

School, employment, and peer-related factors include peer pressure, conflict, bullying, suicidal behaviour among peers and romantic relationship problems. They also include perceived or actual poor academic performance, absenteeism, school suspension or expulsion, and dropping out of school.

In 2018 and 2019, the majority (46) of young people who died by suicide were enrolled in school, TAFE, or university. Two young people were employed. Learning challenges were identified for 18 young people, including ADHD, learning disabilities such as dyslexia and receptive language issues, and other matters requiring learning support. Many of these young people had trouble in completing course

121. Pompili M, Serafini G, Innamorati M et al 2012. Substance abuse and suicide risk in adolescents. *European Archives of Psychiatry and Clinical Neuroscience*, 262, 469-85.

122. Bradizza CM, Stasiewicz PR, Paas ND 2006. Relapse to alcohol and drug use among individuals diagnosed with co-occurring mental health and substance use disorders: A review. *Clinical Psychology Review*, 26, 162-78.

123. Hawkins EH 2009. A tale of two systems: co-occurring mental health and substance abuse disorder treatment for adolescents. *Annual Review of Psychology*, 60, 197-227.

124. Johnson J, Cohen P, Gould M et al 2002. Childhood adversities, interpersonal difficulties, and risk for suicide attempts during late adolescence and early adulthood. *Archives of General Psychiatry* 59, 741-9.

125. McNamara P 2012. Adolescent suicide in Australia: rates, risk and resilience. *Clinical Child Psychology and Psychiatry* 18, 351-369.

requirements due to stress, anxiety, or school avoidance. For two young people, a recent significant deterioration in school performance was identified. Interpersonal conflict related to bullying was identified for a further 16 young people, with all but one enrolled in school or TAFE.

In our previous biennial report,<sup>126</sup> we recommended the NSW Department of Education evaluate postvention initiatives in NSW Government high schools, particularly the effectiveness of such initiatives in preventing suicide clusters. In response to these recommendations, the Department of Education advised it is in the process of evaluating postvention initiatives in NSW. This includes benchmarking current responses against best practice approaches and mapping postvention activities, programs, and staff training.

### **9.3. Was suicide risk identified?**

A critical component of suicide prevention is the ability to identify at-risk children and young people and support them to obtain the help they need. Nearly all (46) of the 51 young people who died by suicide in 2018 and 2019 had some involvement with health, education, or social services prior to their death. Our review of records found that in some cases, service providers documented that risk factors for suicide were present prior to the young person's death. In others, service providers documented difficulties being experienced by the young person but did not draw an association with suicide risk. For some young people, there were no recorded concerns that the young person was experiencing significant problems.

As part of our review process for suicide deaths, we classify each death according to whether the young person was identified as being at risk of suicide in agency records, and the extent of identified concerns.

#### **9.3.1. Multiple factors and high risk**

Fourteen of the 51 young people who died by suicide were identified in records as having complex needs and chronic difficulties, placing them at risk for suicide and other adverse outcomes. All had a history of prior suicidal behaviours. All but one had a diagnosed mental illness (commonly comorbid depression and anxiety), and more than half (8) had a family history of mental illness.

In addition to a history of suicidal behaviour and mental illness, our reviews identified other factors present for many of these young people. Most were experiencing interpersonal issues, ranging from family discord to bullying and sexuality and gender concerns. Some (7) had current involvement with child protection, and/or police and the legal system. Substance abuse was identified as an issue for five of the young people. Learning difficulties or academic challenges were experienced by six young people, and three had been suspended from school in the 12 months prior to their death.

All but one of these young people were identified by health services or private practitioners to be at risk of suicide and of these, nine had a suicide safety plan in place that had been developed with those practitioners.

#### **How was risk responded to?**

Young people identified as being at significant risk of suicide had the highest number of agencies involved prior to their death by suicide, including mainstream health services and specialist mental health services. Of the 14 young people, all but one was receiving professional support in the period immediately before their death – including through Child and Adolescent Mental Health Services (CAMHS), private psychologists and psychiatrists, general practitioners, paediatricians, and school counsellors or psychologists. Seven young people were taking prescribed psychotropic medications at the time of their death. One young person had previously been prescribed medication for depression and anxiety but had stopped taking the medication at some point before they died.

The deaths of five of these young people were subject to internal review by the Department of Communities and Justice (DCJ) due to reports of risk of significant harm made about the young person or their sibling in the three years prior to death. The deaths of six young people were subject to Root Cause Analysis (RCA) by relevant Local Health Districts due to their contact with NSW Health in the period immediately before their deaths.

<sup>126</sup> NSW Child Death Review Team 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017. Incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

Our reviews, and those completed by DCJ and NSW Health, identified common issues and themes in the identification and response to risk for this group of young people, including:

- the need for improved coordination, purposeful collaboration and information sharing where multiple agencies are involved with a young person who may be at risk of suicide
- the need for flexible service provision and access to appropriate services.

### Case studies: Coordination and collaboration

A young person with a lengthy history of mental health issues had been reported to DCJ on numerous occasions in the three years prior to death about their declining mental health, lack of engagement with mental health services, and challenging behaviour. Most reports were closed due to “competing priorities”. Our review identified missed opportunities by DCJ to intervene in the young person’s life. The DCJ internal review identified similar issues, noting there were opportunities for DCJ to assess their role in supporting the young person’s engagement with health services. NSW Health’s review of their involvement with this young person also noted the need for collaborative clinical review and increased communication with shared care partners.

Our review of another young person with an extensive child protection history and multi-agency involvement identified issues in coordination between agencies involved in the young person’s care. In their internal reviews, both DCJ and NSW Health noted missed opportunities to share information, undertake joint assessments, and collaborate in a purposeful way to support the young person and bring agencies together to ensure service provision was coordinated and each agency was clear about their roles and responsibilities.

### Case study: Flexible service provision

A young person receiving specialist mental health and education support was exited from a service after reaching the maximum period of support (two months) allowed by the service. The young person was still in need of intensive mental health support that could not be provided by other services. Our review identified a lack of flexibility in the service’s model of care and a gap in the provision of community-based adolescent transition (step-down) programs. NSW Health’s review of their involvement with the young person also reflected on these issues and recommended review of discharge planning and transition arrangements.

## 9.3.2. Some factors and moderate risk

Nineteen young people were identified in records as having some difficulties but were not seen as being at acute risk of suicide. While most of these young people had a history of suicidal or self-harming behaviours, only six had been identified by health professionals to be at some risk of suicide. Three of these young people had strategies in place to address risk such as advice to contact 24-hour telephone counselling services. Approximately two-thirds (14) of these young people experienced adverse proximal events or interpersonal difficulties such as bullying, a relationship breakdown, conflict and self-esteem or body issues, and nearly half had identified substance abuse problems.

Almost three quarters (12) had a diagnosed mental illness – commonly depression or anxiety. Of these, seven had, at some time, taken medication to treat their illness. Signs of emergent mental illness, identified by family members or friends during post-death investigations or documented in records (such as in school counsellor notes), were evident for five of these young people.

### How was risk responded to?

Most of the young people (17 of 19) were involved with several agencies prior to their death. Almost all were enrolled at secondary school or TAFE; and nearly half (9) had contact with child protection services and/or mainstream health services. Just under one-third of these young people were in contact with specialist mental health services, and some (4) were engaged with a family support agency.



Our reviews identified issues in relation to the recognition of and response to risk, interagency coordination, timely access to services, and concerns not being reported. For some of these young people, opportunities for early intervention in relation to their declining mental health were impacted by the availability of appropriate support.

### Case study: Timeliness of support

A young person with a history of suicide ideation who was not assessed as being at acute risk of suicide was unable to access timely mental health support because of lengthy waiting periods. While the young person was not considered in need of urgent intervention, the significant delays in accessing mental health support meant their declining mental health was not addressed.

### 9.3.3. Few factors and low risk

For 18 of the young people who died, records indicated that involved agencies did not consider the young person as a suicide risk and identified few risk factors in this regard.

The majority of these young people (17) experienced an adverse proximal event prior to their death, and over half (11) were noted to be experiencing interpersonal difficulties.

Most of the young people were in contact with at least one agency prior to their death. Almost half (8) had some involvement with mainstream health services for general health care, and some (6) with child protection services. Only one of the young people with few identified suicide factors had seen a specialist mental health service.

## 9.4. Young people in care

Two young people who died by suicide in 2018 and 2019 were in care at the time of their death. Both young people had experienced traumatic or adverse events and had high and complex needs, including diagnosed mental illness, substance abuse, self-harming, and suicidal behaviour. Internal reviews undertaken by DCJ found its responses to risk were inadequate, coordination of services within DCJ and between agencies was lacking, and the complex needs of these young people were not fully explored or understood. For one young person, DCJ's review noted the young person '*required more urgent efforts and collaborative responses*', that the young person's '*vulnerability was not well understood*', and that '*risk and warning signs ...were not adequately addressed*'. DCJ's review for the other young person noted '*joint conversations [with the young person, their family and other service providers] ...were infrequent and did not include participation*', and that the involvement of agencies '*was fragmented, without established role clarity*'.

Our reviews have consistently identified that young people in out-of-home care are particularly vulnerable, and frequently present with high and complex needs. In our *Report of Reviewable Child Deaths in 2014 and 2015*,<sup>127</sup> we noted that risk reports relating to the behaviour of vulnerable young people with complex support needs were not always prioritised for a child protection response or assessed holistically, that coordination of care to address their complex needs was not always evident, and that strategies needed to be developed to work with young people who may be difficult to engage. We recommended that DCJ (then Department of Family and Community Services) should:

*Consider the issues we raised in this report relating to the suicide and risk-taking deaths of young people in care, in particular:*

- i) response to reports of risk of significant harm (ROSH), particularly relating to self-harming and risk-taking behaviour (including suicide attempts and threats of suicide, and substance abuse)*
- ii) identification of, and response to, escalating risk-taking behaviour*
- iii) lack of placement stability and homelessness.*

*FACS should provide us with details of current or proposed strategies to address these issues.*

127. NSW Ombudsman 2017. Report of reviewable child deaths 2014 and 2015. NSW Ombudsman, Sydney.

DCJ accepted our recommendation and told us its strategies included the establishment of the Intensive Therapeutic Care (ITC) service system, a dedicated trauma treatment service to improve long-term outcomes for children and young people in care, and policy and practice guidance for staff in assessing risk for vulnerable children and young people where alternate pathways to assessment were required.

Regarding how the agency responds to risk of significant harm reports for children and young people in care, particularly those relating to self-harm and risk-taking behaviours, DCJ told us it used an 'Alternate Assessment Tool' to assess ROSH reports for children in care. We were advised in 2019 that the tool was under review.<sup>128</sup>

In September 2020, DCJ advised it had reviewed the use of the Tool since early 2019. DCJ noted some issues had been identified about useability, definitions, and practice guidance, and that to address these issues it was finalising a comprehensive policy and procedure manual to sit alongside the Tool to better support its application. DCJ expected the manual would be completed in late 2020.

In February 2021, DCJ advised that its draft policy and procedure manual had not been endorsed for release because it decided to commence a new project to review more comprehensively some of its structured decision-making tools – particularly the Alternate Assessment Tool – with the aim of making further changes to improve the Tool. DCJ is considering whether to release the manual or await the outcome of its current review.

### Case study: Missed opportunities in responding risk to a child in care

In November 2020, the NSW Coroner held an inquest into the death of a young person in care from a drug overdose in suspicious circumstances. 'Becky', who was 15 years old, died as a result of a combination of methyl amphetamine and methadone toxicity at the home of a 42-year-old man.<sup>129</sup> She was described by the Deputy State Coroner as a young teenager '*spiralling out of control*', an extremely vulnerable young person, and in need of urgent and professional support.

The inquest considered issues relevant to suicide of young people in care – particularly the adequacy of DCJ casework and responses to ROSH for vulnerable young people. Becky's diary entries two years prior to her death included disclosures of self-harm and a previous suicide attempt, and detailed suicide plans. The Deputy State Coroner noted that at the time of her death there were no indicators that Becky was contemplating suicide.

In her findings, the Deputy State Coroner commented that contact with the young person by DCJ and Life Without Barriers – the agency that held case management responsibility – was insufficient.

In addition, DCJ's '*lack of information [about the young person's] significant mental health and substance use issues meant they were ill-equipped to assist [the young person] with those challenges.*' The findings further note missed opportunities for information to be shared between agencies, and to engage with the young person or the significant people in the young person's life in case planning. The Deputy State Coroner made recommendations to DCJ to:

- Consider a review of its internal practices and policies (and those applicable to private out-of-home care providers) in relation to expressing the frequency of face-to-face contact with young people in care, and when such contacts should be increased or decreased.
- Consider a review of policies surrounding Child Assessment Tool assessments, to remove barriers to re-assessment if their circumstances or needs change.
- Review if there is sufficient evidence of the need for at least one mandated review of children in care between the ages of 13-15 years – a period when they are more likely to experience significant changes, placement disruption and engage in behaviour that may expose them to risk.

Agencies have six months to provide advice to the Attorney General on actions being taken to implement Coronial recommendations. At the time of writing, information about DCJ's response was not yet available on the Communities and Justice website.<sup>130</sup>

128. FACS Secretary, correspondence to the Ombudsman on 21 January 2019.

129. Coroners Court NSW 2021. Inquest into the death of Becky. Accessed from [https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2021/Findings\\_Becky.pdf](https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2021/Findings_Becky.pdf) on 6 April 2021.

130. NSW Department of Communities and Justice. Government responses to coronial investigations. Accessed from <https://www.justice.nsw.gov.au/lrb/Pages/coronial-recommendations.aspx> on 14 February 2021. DCJ have advised it will provide its response to the Attorney General by 17 September 2021.



## 9.5. Observations and Recommendations

The *Strategic Framework for Suicide Prevention in NSW 2018-2023*<sup>131</sup> (the Strategic Framework) includes a number of initiatives and strategies to address suicide risk as part of the *Towards Zero Suicides Premier's Priority*. We have previously noted that many of these initiatives are not specific to children and young people, and that responding to suicide risk among young people requires a different approach than for other age groups. Mental illness often emerges in adolescence – and developmental changes during this time can result in impulsivity and poor decision making which in turn affects how young people respond to and communicate distress.<sup>132</sup>

### 9.5.1. The rate of suicide among young people in NSW is increasing

Unlike other causes of death for children and young people in NSW, deaths by suicide have not declined. The increase in suicide is consistent with national trends over the past five years (2015-2019), which show higher mortality rates among young males aged 17 years and under and Aboriginal and Torres Strait Islander people of all ages.<sup>133, 134, 135</sup>

Ongoing monitoring and evaluation are critical to understanding the effectiveness of suicide prevention strategies and initiatives, and in identifying gaps in service delivery and opportunities for improvement.

Launched in November 2020, the NSW Suicide Monitoring and Data Management System is a new collaboration between the NSW Ministry of Health, Department of Communities and Justice, the State Coroner and NSW Police to enable the collection and reporting of information on recent suspected and confirmed suicides in NSW.<sup>136</sup> The monitoring system uses data collected by NSW Police and the State Coroner to provide information to support communities, local organisations and government agencies to respond to suicide in a more timely and effective way.

The first NSW Suicide Monitoring System Report was published on 9 November 2020 and provides the first estimates of suspected suicides in NSW in 2019 and 2020 from the newly established System.<sup>137</sup> It includes suspected suicides of young people aged under 18 years. The information can be used to assist in the evaluation and improvement of services to vulnerable people and has the potential to save lives.

### 9.5.2. A coordinated approach to responding to risk is critical

Most school-aged young people who died by suicide in 2018 and 2019 were previously identified as being at some risk by agencies. A sustained, coordinated response to young people with mental health needs or who may be at risk of suicide is critical in responding to risk, as is the need for purposeful collaboration and information sharing where multiple agencies are involved or where a young person has disengaged from services.

While engagement of at-risk young people remains a challenge for service providers, there are opportunities for agencies to support a young person's engagement through sharing of information and coordination of safety planning. Contact between agencies throughout a young person's involvement with a service to identify roles, responsibilities, roadblocks to sustained intervention and focussed safety plans is fundamental to effective management and containment of risk.

131. Strategic Framework for Suicide Prevention in NSW 2018-2023. Accessed from <https://nswmentalhealthcommission.com.au/resources/strategic-framework-for-suicide-prevention-in-nsw-2018-2023> on 17 May 2021.

132. Robinson J 2016. Raising the bar for youth suicide prevention. Orygen, the National Centre of Excellence in Youth Mental Health, Melbourne.

133. Australian Bureau of Statistics 2020. Causes of death, Australia. Australian Bureau of Statistics, Canberra.

134. Young C, Hanson C, Craig JC et al 2017. Psychosocial factors associated with the mental health of indigenous children living in high income countries: a systematic review. *International Journal for Equity in Health*, 16, 153.

135. Williamson A, Skinner A, Falster K et al 2018. Mental health-related emergency department presentations and hospital admissions in a cohort of urban Aboriginal children and adolescents in New South Wales, Australia: Findings from SEARCH. *BMJ Open*, 8: e023544.

136. NSW Health 2021. NSW Suicide Monitoring System. Accessed from <https://www.health.nsw.gov.au/mentalhealth/Pages/suicide-monitoring-system.aspx> on 23 April 2021.

137. NSW Health 2020. NSW Suicide Monitoring System – Report 1 – October 2020. Accessed from <https://www.health.nsw.gov.au/mentalhealth/resources/Pages/suicide-monitoring-report-oct-2020.aspx> on 23 April 2021.

### 9.5.3. Timely access to appropriate services and strategies to address emerging mental health concerns continues to be crucial to the delivery of services and support

Our reviews identified that for some young people who died by suicide, while acute risk was not apparent, signs of mental illness or suicidal behaviours had been recognised either by family members or friends, or were documented in records in some circumstances.

Enhancing resilience and improving other protective factors such as strong family relationships, access to support when needed and problem-solving skills can help decrease suicidal ideation and behaviours in young people.<sup>138</sup>

In our *Biennial report of child deaths in 2016 and 2017*,<sup>139</sup> we noted there is no focused suicide prevention plan for young people in NSW, and that identification of suicide risk in young people must be supported by effective strategies to manage and contain risk. We recommended the NSW Government should:

*Include in any suicide prevention plan specific measures targeted to school-aged children and young people across the spectrum of need, including:*

- Universal strategies that promote wellbeing
- Early intervention designed to arrest emerging problems and difficulties
- Provision of targeted, sustained, and intensive therapeutic support to young people at high risk – including strategies for reaching those who are hard to engage.

We also recommended that the NSW Government should direct funds associated with the Strategic Framework<sup>140</sup> to address gaps in the delivery of appropriate specialist mental health services for children and young people in NSW.

The NSW Government supported both recommendations. In June 2020, the Department of Premier and Cabinet (DPC) advised it was considering how best to act in the context of the Framework and the *Towards Zero Suicides Premier's Priority*.<sup>141</sup> The advice contained details about a range of initiatives and strategies relevant to children and young people and noted that NSW Health would be taking the lead on behalf of the NSW Government for future updates. The initiatives include preventative mental health programs for high school students, a local suicide alert system to allow for rapid sharing of information about people at risk of suicide, and a Youth Aftercare Pilot trialling new models of suicide attempt aftercare for young people.

We note DPC's recent advice that responsibility for our recommendations has been transferred to NSW Health. We also acknowledge advice that initiatives under *Towards Zero Suicides* and the Framework will potentially contribute to addressing gaps in mental health services for young people. We will continue to monitor these issues and recommendations through NSW Health, and will have close regard to the implementation of initiatives linked to the Framework and Premier's Priority.

138. Ciarrochi J, Gordon C, Jones S 2019. Learning resilience, and social and emotional (SEL) skills: an evidence check rapid review brokered by the Sax Institute for Be You.

139. NSW Child Death Review Team 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017. Incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

140. NSW Child Death Review Team 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017. Incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

141. NSW Health 2021. Towards zero suicides initiatives. Accessed from <https://www.health.nsw.gov.au/mentalhealth/Pages/services-towards-zero-suicides.aspx> on 14 February 2021. *Towards Zero Suicides* is an \$87 million investment over three years in new suicide prevention initiatives that address priorities in the *Strategic Framework for Suicide Prevention in NSW 2018-23* and contribute to the Premier's Priority to reduce the suicide rate by 20 per cent by 2023.

#### 9.5.4. Young people in care remain vulnerable to suicide

Concerns about timely and effective responses to risk, coordination of services within DCJ and between agencies, and holistic assessment of the complex needs of young people in care continue to be identified both in our reviews and by DCJ in its own internal reviews of the suicide deaths of children in care.

As detailed in section 9.4 above, the response to our 2017 recommendation that DCJ consider, and provide details of strategies to address responses to ROSH for children in out-of-home care relating to self-harming and risk-taking behaviour (including suicide attempts and threats of suicide, and substance abuse) has not been substantive. DCJ has advised that the assessment tool tailored to assessing risk for children and young people in care remains under review. It is unclear what interventions beyond the assessment tool are currently in place to identify and respond to suicide risk. We therefore recommend that:

##### **Department of Communities and Justice (DCJ) detail:**

- a. **the current response pathway when a ROSH report relating to suicide risk or suicide-related behaviours is made for a child or young person in out-of-home care.**
- b. **the current response pathway when a case manager or caseworker otherwise identifies suicide risk or suicide-related behaviours for a child or young person in out-of-home care.**
- c. **current interventions that have been implemented to reduce suicide risk or suicide-related behaviours for children and young people in out-of-home care, including but not limited to gatekeeper training or other skills training for caseworkers and foster or kinship carers.**
- d. **The current status of the Out-of-Home Care Health Pathway Program and available data from this program that relates to the identification of and response to suicide risk or suicidal-related behaviours.**
- e. **Any screening tools in place to identify suicide risk or suicide-related behaviours for a child or young person in out-of-home care that are applied during routine placement or other annual reviews.**

## 10. Abuse and neglect

In 2018 and 2019, 19 infants and children died as a result of abuse or neglect, or in suspicious circumstances.

Very young children were most vulnerable to fatal abuse and neglect, with children under five years accounting for over half the deaths.

Most of the children who died were from families known to child protection authorities. Over the past 10 years, the proportion of children with a child protection history among abuse and neglect-related deaths has more than doubled.

### 10.1. Abuse and neglect overview

All deaths of children aged 0-17 years that are the result of abuse or neglect or that occur in suspicious circumstances are reviewable by the NSW Ombudsman. In 2018 and 2019, 19 children died as a result of abuse (15) or neglect (2), or in suspicious circumstances (2).

For the purposes of our review function:

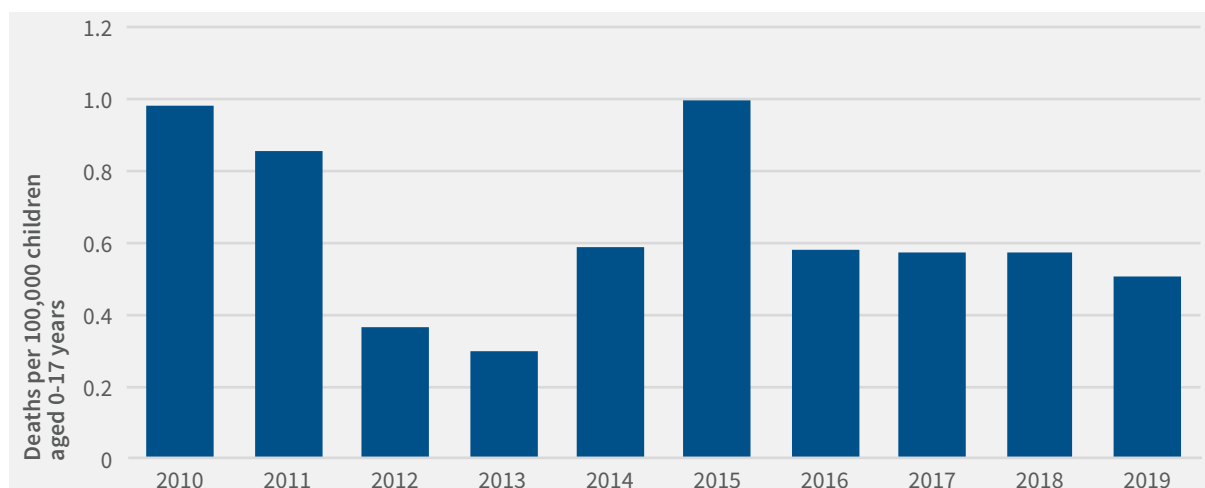
- A death is classified as having been the result of abuse if an act of violence by any person directly against a child or young person causes injury or harm leading to death.
- A death is classified as having been the result of neglect if a reasonable person would conclude that the actions or inactions of a carer exposed the child to a high risk of death or serious injury. Examples of carer neglect in this context include deprivation of sufficient food or liquid to sustain life, abject failure to seek medical assistance or comply with medical advice and exposing children to life threatening injury because of alcohol and/or drug intoxication.
- A death is classified as suspicious where there is evidence that the child's death may have been the result of abuse or neglect, but the evidence is insufficient for this to be reasonably determined.

This chapter refers to abuse, neglect, and suspicious deaths together as 'abuse and neglect related' deaths.<sup>142</sup>

### 10.2. Abuse and neglect-related deaths in 2018-2019, and trends

Over the 10 years 2010-2019, the deaths of 107 infants and children were abuse and neglect-related, representing 2.0% of all child deaths during the period. The 107 deaths include 72 children who died as a result of abuse (three of whom were also in care), 18 children who died as a result of neglect, and 17 children who died in suspicious circumstances.

Figure 53. Abuse and neglect-related child mortality rate (aged 0-17 years) by year, NSW 2010-2019



142. This chapter reports on 10-year trends as a result of changes abuse and neglect categorisation guidelines prior to this.

### 10.2.1. Abuse and neglect-related deaths by demographics

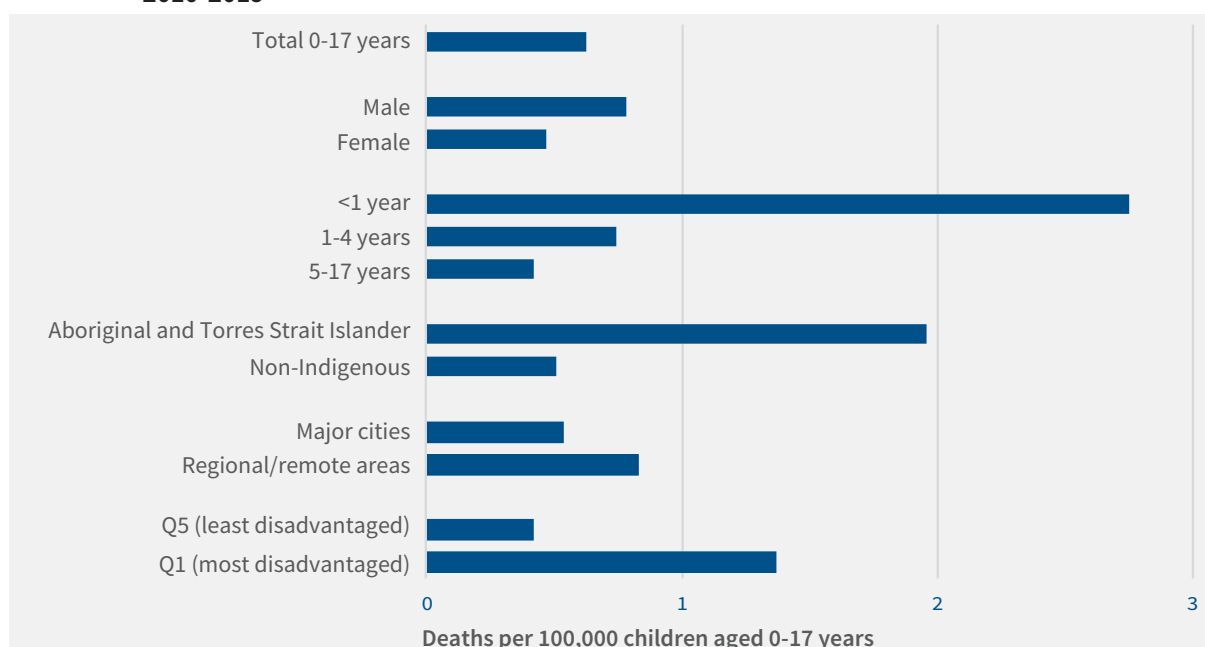
In 2018 and 2019, 11 of the 19 children whose deaths were abuse or neglect-related were aged less than five years, including six infants and five children aged 1-4 years. Children under five years have consistently accounted for more than half of all abuse and neglect-related deaths in NSW over the 10 years, 2010-2019.

Of the 19 children, 12 were male and seven were female. Over the past 10 years, male children accounted for nearly two-thirds of abuse and neglect deaths. This difference is largely due to the greater number of abuse-related deaths among males aged 10-17 years.

One-third (6) of the children who died in 2018 and 2019 were Aboriginal or Torres Strait Islander. Over the 10-year period approximately one in five (21%) children were Aboriginal or Torres Strait Islander.

In 2018 and 2019, 10 of the 19 children resided in the most socio-economically disadvantaged areas of NSW. This has consistently been the case over the past ten years, 2010-2019, with nearly half (47%) of all children whose deaths were abuse or neglect-related living in the most socio-economically disadvantaged areas of NSW.

**Figure 54. Abuse and neglect-related child mortality rate (aged 0-17 years) by demographics, NSW 2010-2019**



### 10.2.2. Abuse and neglect-related deaths by child protection history

Among the 19 children who died, almost all (16) were from families with a child protection history. Most (13) of these families were the subject of a report screened as ‘risk of significant harm’ (ROSH) within the three years prior to death. The other three families were the subject of a report screened as non-ROSH (2) or made to a Child Wellbeing Unit (1).

The proportion of children known to child protection services whose deaths were abuse or neglect-related has increased over the 10-year period, from 44% in 2010, to 59% in 2015, to 89% in 2019. This proportion has more than doubled over the 10 years. Although children with a child protection history are over-represented in deaths from all causes (21%), the extent of over-representation in abuse and neglect-related deaths is much higher.

### 10.2.3. Charges and convictions

At the time of writing, police investigations have identified 13 males and 11 females responsible for, or allegedly responsible for, the deaths of the 19 children. In eight cases more than one person is implicated in the death, and in one case a single person caused the deaths of two children.

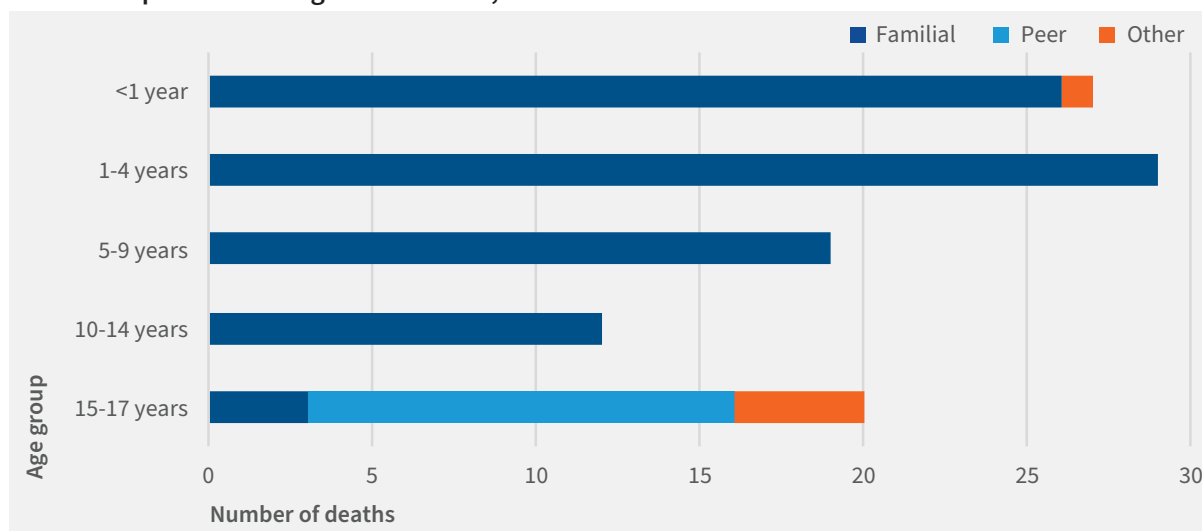
Criminal charges against eight individuals were finalised at the time of writing:

- **Convicted:** five individuals were convicted of offences including murder, aggravated dangerous driving occasioning death, and fail to provide care for child causing danger of death.
- **Not criminally responsible:** two people charged with murder in separate incidents were found not guilty by reason of mental illness and detained in facilities to receive treatment, and a third person was assessed as unfit to stand trial based on their mental health and was also detained for treatment.
- **Deceased:** No charges are possible for the deaths of four children because the three people identified by police as responsible also died in the incidents.
- **Proceedings underway:** criminal processes are still underway for 11 persons of interest charged in relation to the deaths of seven children.
- **Ongoing investigations:** three cases are open police investigations.

### 10.3. Circumstances of abuse and neglect-related deaths

The 19 children belonged to 18 families; in one family, two children died in a single incident. All but one of the children died in the context of familial abuse or neglect; one child, a teenager, was killed by unrelated individuals. This is consistent with trends across the 10-year period showing that most abuse and neglect deaths occur within the child’s family, except for young people aged 15-17 years, where deaths generally occur in the context of peer violence.

**Figure 55. Abuse and neglect-related deaths among children aged 0-17 years by the relationship of person causing harm to child, NSW 2010-2019**



Just over half (9) the children who died from abuse were less than five years of age, including four infants. All the persons identified as responsible in cases involving young children were parents or persons acting in a parental role. All but two of these children were killed in their home. Four of the children died in the context of murder-suicide.

The two children who died in circumstances of neglect were both aged 5-9 years. One child was in the care of a family member who was driving while intoxicated; the other child died in the context of the carer’s failure to seek timely medical aid after the child ingested prescription medication (methadone) left within the child’s reach.

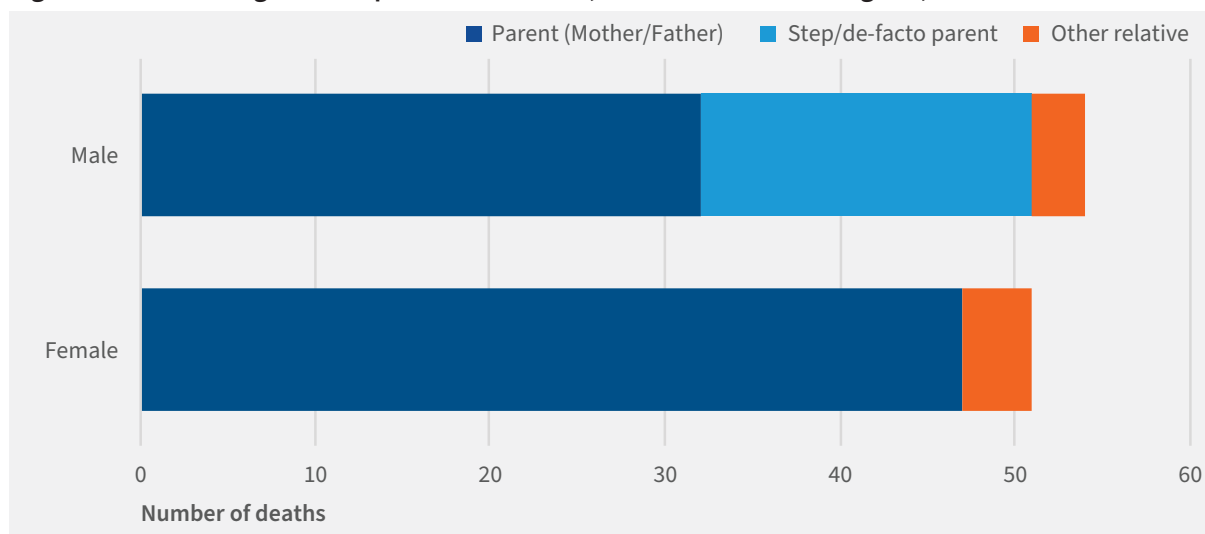
The two children who died in suspicious circumstances were both infants who sustained serious non-accidental injuries. Post-mortem examinations were unable to establish a direct cause of death, and investigations into these deaths remain open.

### 10.3.1. Persons causing harm

In 2018 and 2019, all but one death involved familial abuse or neglect. The following discussion focuses on risks and factors within families, and those posed by the parents or carers responsible, or allegedly responsible, for causing harm.

Twenty-four people have been identified as involved in the 18 deaths, including 13 males and 11 females. Regardless of the carer's gender, in the vast majority of cases a biological parent was implicated in the child's death. However, there were some differences by gender for abuse and neglect-related deaths between 2010-2019. Male persons of interest were more likely to have had a range of relationships with the children – biological father, step-father or defacto/intimate partner of a birth mother, or other relative. Females were overwhelmingly the biological mother of the child. This is consistent with research which shows the three most common perpetrators of filicide are mothers, fathers and step-fathers.<sup>143</sup>

Figure 56. Role and gender of person of interest, familial abuse and neglect, NSW 2010-2019



## 10.4. Factors identified for abuse and neglect deaths, 2018-2019

Understanding factors associated with abuse and neglect-related deaths is important when considering effective prevention and early intervention strategies, and identifying families who are most likely to benefit from additional support.<sup>144</sup> Our reviews have identified factors in many of the families in which children died in circumstances of abuse or neglect that are well-recognised child protection issues – including parental alcohol and drug abuse, mental illness, and a history of domestic or other violence. Although these factors can place children at risk, they are not clear predictors of fatal abuse or serious injury and are also present in families not characterised by child death. They are, however – especially in combination – factors associated with abuse and neglect, and important when considering effective prevention strategies.

### 10.4.1. Family violence and relationship factors

Domestic violence, relationship breakdown, and the involvement of new partners were identified in the family background of most (13) of the 18 children who died as a result of familial abuse or neglect. These issues were often present in combination with parental mental health and substance misuse.

- Seven children were from families where there was evidence of domestic violence in the home, and in two cases an Apprehended Violence Order was in place to protect a parent at the time of the child's death. In all but one family the perpetrator of previous domestic violence was responsible for, or implicated in, the child's death.

143. Brown T, Tyson D, & Fernandez Arias P 2018. Filicide in Australia, in *When Parents Kill Children*. Current Issues in Criminal Justice, 30, 71-74.

144. Australian Institute of Family Studies 2017. Risk and protective factors for child abuse and neglect. Accessed from <https://aifs.gov.au/cfca/publications/risk-and-protective-factors-child-abuse-and-neglect> on 3 April 2021.



- Six children were living in families characterised by relationship breakdown and conflict, including three children who died at the time divorce/custody disputes were before the Family Court. Another child died in an incident that occurred against a background of wider family discord that resulted in the death or serious injury of several related individuals.

Five children (including three infants and two children aged 1-2 years) were living in households with defacto fathers and/or new male partners of the child's biological mother. Three children were found to have unexplained injuries and bruising at the time of their death that suggested previous harm. Our reviews, and the serious case reviews conducted by DCJ, have previously highlighted the need to consider child protection risks posed by new male partners in vulnerable households.<sup>145</sup>

### Case study: Domestic violence and relationship breakdown

The NSW Coroner has jurisdiction over all reviewable child deaths.<sup>146</sup> In April 2021, the State Coroner published findings of an inquest into the deaths of two children who were fatally shot by their father in 2018 using one of his legally obtained firearms in the home they shared with their mother.<sup>147</sup> Later the same day, the father died by suicide. Five months after the children were killed, their mother also died by suicide. The deaths occurred in the context of ongoing domestic violence and abuse perpetrated by a man with a documented history of domestic and family violence against previous partners and children. Our review of the children's deaths identified issues in relation to multiple agency service involvement and risk management – particularly within NSW Police Force commands (local area and the NSW Firearms Registry) – against a background of family law proceedings. These issues, along with the role and conduct of family law professionals outside the Ombudsman's jurisdiction, were fully canvassed in the inquest.

The inquest focused on the police response to domestic violence and stalking allegations, NSW Firearms Registry permit and licensing procedures, gun club memberships and legislation, and family law proceedings – to *'consider whether, and the extent to which, any of those areas contributed to, facilitated, or failed to prevent, the [father's] ability to join a gun club, obtain a firearms permit and licence, and purchase a number of firearms, despite his history of domestic abuse and the existence of acrimonious divorce proceedings between he and [the children's mother].'*

Magistrate O'Sullivan found the children's deaths were preventable, and that although the mother and children disclosed their experiences of violence and abuse perpetrated by the father to multiple agencies, entities, and professionals in the police and within the family law system, none had effectively mobilised to protect them. Similarly, the regulatory framework did not offer the protections needed to prevent the deaths.

Magistrate O'Sullivan noted that although these deaths had been the catalyst for significant practical reform, there were still areas in need of improvement to address systemic and individual shortcomings identified in the inquest. The 24 recommendations made to various parties – the NSW Police Force (including the NSW Firearms Registry), the NSW Government, and the Office of the Legal Services Commissioner – aim to achieve this end. The recommendations include strategies to ensure operational police comply with the requirements set out in the Domestic Violence Standard Operating Procedures and understand the use of the Domestic Violence Safety Assessment Tool and Supervisor's DV Checklist, suggested legislative and regulatory amendments, improvements to NSW Firearms Registry processes and procedures, strategies to ensure better information sharing between federal family law courts and NSW Police, and investigation of the need for further action in relation to an Independent Children's Lawyer. At the time of writing, the Attorney General has not yet received a formal response to any of the recommendations.<sup>148</sup>

145. NSW Ombudsman 2015. Report of Reviewable Deaths I 2012 and 2013. Volume 1: child deaths. NSW Ombudsman, Sydney.

146. Section 24(1)(d) of the *Coroners Act 2009* provides that the Coroner has jurisdiction to hold an inquest concerning the death of a person if that person was 'a child whose death is or may be due to abuse or neglect or that occurs in suspicious circumstances'.

147. NSW Coroners Court 2021. Inquest into the deaths of John, Jack and Jennifer Edwards. Accessed from [https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2021/Inquest\\_into\\_the\\_deaths\\_of\\_John\\_Jack\\_and\\_Jennifer\\_Edwards\\_-\\_findings\\_of\\_State\\_Coroner\\_dated\\_7\\_April\\_2021.pdf](https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2021/Inquest_into_the_deaths_of_John_Jack_and_Jennifer_Edwards_-_findings_of_State_Coroner_dated_7_April_2021.pdf) on 8 April 2021.

148. Agencies and Ministers are required to report to the Attorney General, within six months of receiving a coronial recommendation, outlining any action to be taken to implement the recommendation. Responses are published at <https://www.justice.nsw.gov.au/lsb/Pages/coronial-recommendations.aspx> accessed 9 May 2021.



## 10.4.2. Parental mental illness

Police and coronial records identified parental mental illness as the primary contributory factor in the deaths of five children, including:

- Two children who died in separate murder-suicide incidents, and another who died in an attempted murder-suicide incident. All three parents were mothers with a history of diagnosed mental health problems (depression and/or anxiety). Our work has noted that mental illness is often a significant factor in the actions of birth mothers who killed their children.<sup>149</sup>
- Two children who were killed by fathers experiencing a psychotic episode at the time.

In several other cases our reviews identified a history of parental mental illness (depression, anxiety, and Post Traumatic Stress Disorder), but these issues were not considered to be the main factor which led to the death.

### Case study: Parental mental illness

In 2018, a parent killed his five-year-old son during a psychotic episode.<sup>150</sup> The parent was charged with murder and found not guilty by reason of mental illness, with the judge noting there was no doubt he caused the child's death but that he was not responsible at law for his actions. The parent was detained for an indefinite period, subject to treatment and rehabilitation under the supervision of the Mental Health Review Tribunal.

The parent had a history of mental illness – a long-standing diagnosis of schizophrenia – and was prescribed medication to manage his condition. At the time of the fatal incident, he was receiving care from a Community Mental Health service. About two months prior to the death, the parent began experiencing a decline in his mental state; he attended a hospital and was assessed as suffering from a relapse of psychosis. He was admitted for treatment and his condition improved. However, following discharge, his mental state again deteriorated. Mental health professionals saw the parent on several occasions over the following weeks and adjusted his medication. In the days prior to the death the parent experienced delusional ideation and auditory hallucinations. Family members sought further hospital admission and conveyed their concerns about the child's safety to health professionals. The parent was last seen at a Community Mental Health Centre the day before the child's death, when he reported his son was safe.

Our review focused on the identification of child protection risks by mental health professionals, continuity and monitoring of care provided, engagement and communication with members of the family, and whether clinical assessments took account of all available information. Our review also considered NSW Health's Root Cause Analysis (RCA) report of its involvement with the family. In addition to practice issues, the RCA identified inadequate engagement with the family by health providers and noted that child protection issues should have been further explored by treating professionals.

The case highlights the importance of frontline health services understanding and exploring possible risk for children of parents with unmanaged mental illness, and the value of engaging fully with families, especially where they are voicing significant concerns about a patient's mental state.

149. NSW Ombudsman 2015. Report of Reviewable Deaths in 2012 and 2013, Volume 1: Child Deaths. NSW Ombudsman, Sydney.

150. NSW Supreme Court 2019. R v BS [2019] NSWSC 935. Accessed from <https://www.caselaw.nsw.gov.au/decision/5d36b180e4b08c5b85d8b24b> on 9 May 2021.

## NSW Family Focused Recovery Framework 2020-2025

We have previously identified the importance of ensuring appropriate clinical practice and competency in relation to recognising and responding to any potential risk to children of parents with mental illness.<sup>151, 152</sup> Our work illustrated that the principles of the NSW Health *Children of Parents with a Mental Illness (COPMI) Framework 2010-2015*<sup>153</sup> – the framework guiding practitioners dealing with parents or carers with mental illness – were not being consistently applied. We raised issues mirroring those identified in the case above, including:

- A lack of visibility of the child in mental health assessments, with child safety and wellbeing not always being considered
- A lack of communication and information sharing across services impacting the accuracy of assessment, including child protection assessment, and
- The need for improved communication with families to promote fully informed assessment.

NSW Health conducted a review of the COPMI, and subsequently released its replacement, the *NSW Family Focused Recovery Framework 2020-2025* in November 2020.<sup>154</sup> The Framework aims to guide support to families where a parent lives with mental health issues and has dependent children, through implementing a family focused approach. NSW Health's advice noted that the new framework identifies three goals, being:

1. Achieving holistic, person-centred care through embedding a family focused approach into practice
2. Delivering safe, high quality care through evidence-based interventions to meet the needs of the family, and
3. Delivering connected care through coordinating treatment and support for individuals and families.

In our previous biennial report of child deaths,<sup>155</sup> we recommended that NSW Health, as part of the planned implementation of the Framework should develop an evaluation strategy to ensure the benefits of the framework can be measured and adjusted as needed.

In response to our recommendation, in July 2020 NSW Health advised that an implementation, monitoring, and evaluation plan would support the launch of the new Framework.

In February 2021, NSW Health provided a copy of the Implementation, Monitoring and Evaluation Plan. The plan sets out the state-wide supports to assist with the implementation of the Framework, outlines Local Health District and Specialty Health Network monitoring and reporting requirements and state-wide evaluation activities.

The monitoring and evaluation plan includes information about topics such as the purpose of the evaluation, questions, the three phases of the evaluation, governance, methodology, reporting priorities, and data collection deliverables and timelines. Based on this advice, we accept the intent of our recommendation has been met.

### 10.4.3. Alcohol and other drug use

A background of carer drug and alcohol abuse is frequently a characteristic of families where a child has died in circumstances of abuse or neglect.<sup>156</sup> In 2018 and 2019, alcohol and other drug use was identified as a significant contributing factor in two neglect-related deaths. One child died in a vehicle crash while in the care of a driver who was intoxicated, and one child died from methadone toxicity after accessing medication that was not stored safely.

151. NSW Child Death Review Team 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017. Incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

152. NSW Ombudsman 2017. Report of Reviewable Deaths 2014 and 2015: Child Deaths, Volume 1. NSW Ombudsman, Sydney.

153. NSW Health 2010. Children of parents with a mental illness (COPMI) framework for mental health services. Policy Directive PD 2010\_037. NSW Health, Sydney.

154. NSW Health 2020. NSW family focused recovery framework 2020-2025: a framework for NSW Health services. NSW Health, Sydney.

155. NSW Child Death Review Team 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017. Incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

156. NSW Ombudsman 2017. Report of Reviewable Deaths 2014 and 2015, Volume 1: Child Deaths. NSW Ombudsman, Sydney.

Illicit drug use by parents and carers (methamphetamine, cannabis), as well as alcohol abuse, was identified in the families of another eight children who died in circumstances of abuse or neglect.

### Case study: Parental drug use

In 2018, a child died after ingesting methadone that had been prescribed to the child's parents. The medication was not labelled or stored in its original packaging and had been left in the home where it was accessible to the child. The parents were subsequently convicted of offences in relation to the child's care.

Our review of the death noted the family were known to child protection services, with a history of intergenerational and current concerns including neglect, illicit drug use, transience, and mental health issues. At the time the child died the family were receiving support from a Brighter Futures early intervention service and no significant concerns were documented. We found evidence there had been a previous incident where the child ingested medication prescribed to the parents that was not reported to DCJ. Our review identified issues in relation to the identification and assessment of child protection risks and the management and oversight of takeaway methadone by private prescribers.

Over the five years, 2015-2019, four children died in NSW after ingesting methadone. In each case an adult in the home where the child died was prescribed takeaway methadone by a private medical practitioner. In all cases the methadone was not stored safely and securely as required by NSW Health's clinical guidelines governing opioid dependence.<sup>157</sup>

The NSW Health guidelines provide clinical guidance and policy direction for government, non-government and private practitioners involved in opioid treatment in NSW. The guidelines apply to medical and health practitioners working in both generalist and specialist settings, from acute to community settings. The guidelines confirm the requirements that must be met before a doctor can prescribe takeaway methadone. They include:

- Completion of a standardised risk assessment tool, followed by three monthly reviews
- Consideration of child protection risks in homes where children are living, and
- Advice to patients about adequate and safe storage of takeaway doses.

Our office has undertaken substantial previous work with NSW Health (2005-2010) following earlier deaths from methadone toxicity. This work focused on policy and practice issues concerning the presentation of children to emergency departments, ensuring quality risk assessments by clinicians, monitoring of the 2006 clinical guidelines then in place, and auditing of prescribers operating within those guidelines. Following a review of prescribed methadone takeaway and observed doses in 2007 and again in 2008, NSW Health advised us in 2010 that:<sup>158</sup>

- Most prescribers are prescribing within the guidelines and do not require follow up.
- Prescribers who demonstrated a 'moderate' or 'significant' rate of prescribing outside the guidelines were contacted about their results and re-audited in October 2010. Providers found to be prescribing outside the guidelines for a significant number of patients were also involved in a clinical visit by a Mental Health and Drug and Alcohol Office (MHDAO) clinical adviser.
- Results of the follow-up audit were being analysed to determine the level of compliance with the guidelines, and to outline key recommendations.

157. NSW Health 2006. *Opioid Treatment Program: Clinical Guidelines for methadone and buprenorphine treatment*. These guidelines were in effect until 2018, when NSW Health published updated guidelines – *NSW Clinical Guidelines: Treatment of Opioid Dependence*.

158. NSW Ombudsman 2011. *Report of Reviewable Deaths in 2008 & 2009, Volume 1: Child Deaths*, NSW Ombudsman, Sydney.

## 10.5. Child protection risk and response

### 10.5.1. Communities and Justice

In 2018 and 2019, most (15) of the 18 children who died in circumstances of familial abuse or neglect were from families with a child protection history. Two of these families were the subject of a report screened as non-ROSH.

Of the 13 families who were the subject of a report screened as meeting the ROSH threshold, eight had been the subject of a ROSH report in the 12 months prior to the child's death. Key reported issues included concerns about physical harm, neglect, parental mental health, parental alcohol and/or drug use, domestic violence, and psychological harm. For seven children, the reported risks were related to the subsequent circumstances of death.

Of the eight families subject to a ROSH report in the preceding 12-month period:

- Four cases were open and allocated to a caseworker at the time of the child's death. Three of these families had received a face-to-face casework response, and a Safety and Risk Assessment (SARA) had either been completed or was underway, with casework intervention in progress. A comprehensive SARA was planned in the other case, but the child died before this had occurred.
- ROSH reports were not prioritised for a casework response in four cases:
  - For one family, multiple ROSH reports were closed – either at the outset 'due to competing priorities', at triage following the provision of immediate financial assistance and a support letter to Centrelink, or after referral to early intervention.
  - Reports for two families were closed after referrals to early intervention or the Family Referral Service.
  - A ROSH report for the fourth family was closed 'due to competing priorities'.

Our reviews of the deaths of children reported to DCJ in the preceding 12-month period identified some common themes:

- Premature or inappropriate closure of reports screened as ROSH without comprehensive assessment or face-to-face contact.
- Failure to follow up on the outcome of referrals. In some instances, referrals were made, and cases closed without further assessment or confirmation of the outcome of the referral. Our reviews identified that following referral, some families either refused to engage with the proposed service or did not complete the program offered.
- Problems with the screening of child protection reports at the Helpline; for example, inadequate consideration of cumulative risk in assessing reported concerns.
- Quality of assessments, including a lack of holistic and/or comprehensive assessment of risk and incorrect use of structured decision-making tools.
- Ineffective interagency coordination, collaboration, and information sharing. In one case the agencies involved with a family were not aware of each other's involvement.

## Case study: Premature case closure

In June 2020, NSW Deputy State Coroner (DSC) Grahame published inquest findings into the death of a child where the parent had an acute mental health disorder.<sup>159</sup> Our review of this death identified a range of issues in relation to the child protection system, including the importance of correct application by DCJ of safety and risk assessment structured decision-making tools, screening decisions at the Helpline and their impact on later decisions about case closure, the importance of case planning and interagency information sharing and collaboration, and case closure in the absence of evidence of meaningful change and/or a reduction in the level of risk to a child. The coronial inquest also considered child protection file closure policy in detail. While the DSC acknowledged state-wide reforms had taken place since the child's death in 2016, she remained concerned about the potential for inappropriate or premature case closure, given the risk it can create. The DSC recommended that DCJ *'conduct a review of existing policy and practice mandates to identify additional areas where guidance around case closure can be strengthened in order to emphasise the need to consult with relevant services and develop clear policy on which role can approve closure of cases where there has been a risk assessment of "high" or "very high".'* At the time of writing, DCJ has yet to formally respond to this recommendation.

On 10 March 2021, DSC Grahame published inquest findings into the death of another child who was identified as being at risk of significant harm prior to death, yet was not seen by a caseworker, and who died from inflicted injury in 2012, aged two years.<sup>160</sup> The inquest was held many years after the child's death, and focused on the broader systemic failures that contributed to the death and whether these failures were still relevant. In relation to fatal abuse, the findings note DCJ conceded it held information which should have triggered a face-to-face meeting with the child and his mother, and that this would have allowed caseworkers to properly assess risks present and afforded DCJ the opportunity to initiate appropriate action to ensure the child's safety.

In regards to systemic case closure issues, the findings note that, *'...it remains the position [in 2021] that DCJ does not provide a statutory response to around 70% of children who are the subject of a Risk of Significant Harm report ... this state of affairs is both shocking and completely unacceptable ... [DCJ's statutory responsibility for protecting children and young people] cannot be shifted by creating a culture where overworked or under-skilled staff can close reports, claiming a lack of resources or "competing priorities." These issues must be acknowledged at the highest level and solutions found if resourcing is indeed the issue.'*

The DSC made two recommendations, including that DCJ consider providing guidance to casework staff about the allocation, assessment, and escalation of ROSH reports, noting that despite the passing of years and substantial changes made to child protection systems by DCJ in the intervening time, a member of its senior executive *'was unable to assure the court that a child in Z's position would be seen today...'*

159. Coroners Court New South Wales. Inquest into the death of A P. Accessed from [https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2020/Findings\\_-\\_Inquest\\_into\\_the\\_death\\_of\\_AP\\_-\\_Redacted.pdf](https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2020/Findings_-_Inquest_into_the_death_of_AP_-_Redacted.pdf) on 8 April 2021.

160. Coroners Court NSW 2021. Inquest into the death of Z. Accessed from [https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2021/ZI\\_FINDINGS\\_incorp\\_all\\_redactions.pdf](https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2021/ZI_FINDINGS_incorp_all_redactions.pdf) on 7 April 2021.

## Case study: Referral of ROSH reports

In late 2018, DCJ received two reports that raised significant concerns about a young person's drug use and risk-taking behaviour. Both reports were screened as meeting the ROSH threshold.

The local DCJ Community Services Centre referred the reports to an Intensive Support Service Adolescent Team, who determined it did not have the capacity to allocate the case. The Intensive Support Service in turn referred the matter to a non-government organisation (NGO) and closed the reports.

The NGO advised the Intensive Support Service that it also had no capacity to allocate the matter and noted that its organisation was not suitable for the referral anyway due to the young person's lengthy child protection history. The young person died in early 2019 from a brain injury linked to methylamphetamine toxicity, four months after the reports were received by DCJ.

DCJ completed a 'summary review' of their involvement with the young person. The review noted it was unclear if the referral to the NGO was sent, and that there was no email or record of conversation with the NGO in *ChildStory* or any follow up by the adolescent team about the referral. *ChildStory* is DCJ's information technology system, and the single point for a child protection practitioner to view, create and update information about a child or family.

Our review identified that the reports were closed at the time of referral, and the outcome of the referral was not recorded. We also noted there was no prompt in the system to initiate further action or review by DCJ when the Intensive Support Service and NGO were unable to allocate the case. Effectively this resulted in the closure of two ROSH reports without any safety and risk assessment (SARA).

Many of the issues identified in our reviews were also identified in DCJ internal reviews of cases. The Serious Case Review unit (SCR) within DCJ reviews the agency's involvement with all children who have died and who 'were known to DCJ'.<sup>161</sup> These practice reviews consider how DCJ systems at a local and organisational level may have impacted on practice with the families of children who died:<sup>162</sup>

*'the reviews create learning opportunities for practitioners who work with families by not only identifying areas for practice improvement, but also promoting good practice. This in turn can lead to broader system improvements.'*<sup>163</sup>

DCJ states that 'approximately 90 serious case reviews are undertaken each year following a child's death' and it reports publicly on its reviews annually. DCJ reviews can result in recommendations to address the deficiencies identified, as well as other practice-based strategies to improve its response in future interventions. 'A small portion of the reviews completed each year have implications for state-wide practice and organisational systems. These reviews are considered by the Serious Case Review Panel'. Established in 2016, the Serious Case Review Panel meets quarterly to discuss complex practice reviews and consider the issues raised for child protection and out of home care practice within DCJ, as well as the broader relationships with other government and non-government services. The Panel is made up of senior executives from across DCJ to ensure input from multiple perspectives and ownership of recommendations across the department. DCJ advised:

*'this collaborative approach aims to share responsibility for recommendations arising from reviews and promote widespread organisational learning and change ... the OSP [Office of the Senior Practitioner within DCJ] maintains a secretariat role for the Serious Case Review Panel and monitor the progress of recommendations. The Panel reports to the DCJ Executive Board on its work and the progress of systemic recommendations.'*<sup>164</sup>

161. DCJ's definition of a child known to DCJ is different to the NSW Ombudsman's definition of a child with a child protection history. DCJ does not include children (or siblings of children) who are the subject of a report screened as non-ROSH at the Helpline, or reports made to Child Wellbeing Units. Accessed from <https://www.facs.nsw.gov.au/resources/publications/child-death-reports> on 3 May 2021.

162. NSW Department of Communities and Justice 2020. Child Deaths 2019 Annual Report. NSW Department of Communities and Justice, Sydney.

163. NSW Department of Communities and Justice 2020. Child Deaths 2019 Annual Report. NSW Department of Communities and Justice, Sydney.

164. Page 15, DCJ-CD-Annual-Report-2019\_2020 (10).pdf accessed 30 July 2021.



## Children with no child protection history

Of the three children who did not have a child protection history, our reviews identified one family where risk was present, who was known to a service provider with a reporting obligation, and should have been reported to child protection services.

In this case the mental health professional involved with the family did not appear to recognise that the parent's declining mental health posed a risk to the child, and as a result they did not make a report to DCJ. An RCA review conducted by NSW Health following the child's death noted the clinician was overly reliant on the family to manage the situation, and that the clinician appeared to have had only a superficial understanding of the parent's role and level of contact with the child. NSW Health subsequently undertook an additional investigation that specifically considered the clinician's handling of child protection issues. The investigation found the child's safety and wellbeing was not assessed as required by policy, that a mandatory report was not made, and that the COPMI referral that was made was not appropriate as a response to risk.<sup>165</sup> We agree with these findings.

For the other two families, either no concerns were noted in service provider records or agency involvement was not relevant to the circumstances of the child's death.

### 10.5.2. NSW Health

In 2018 and 2019, NSW Health had significant prior involvement with six families – in four cases this involvement was relevant to the circumstances of the child's death.

Of these, three matters involved very young children – including two infants – who were presented to hospital emergency departments for assessment and/or treatment of physical injuries.

#### Suspicious child deaths involving prior injury presentation

In 2017, we recommended to NSW Health:

*If a child dies in suspicious circumstances within 12 months of being presented to a NSW public health facility with a physical injury, and the NSW Ombudsman considers an internal review is warranted, NSW Health, in conjunction with the Clinical Excellence Commission, should establish a process for comprehensive review of the interaction of that facility with the child and their family.<sup>166</sup>*

Accordingly, since April 2018, NSW Health and the Clinical Excellence Commission have implemented a process for the internal review of suspicious child deaths where the child had been presented to a NSW public health facility in the 12 months before the death for physical injury. The deaths are referred to the Ministry by the Ombudsman.<sup>167</sup>

Post-death investigations found evidence that four children who died in 2018 and 2019 in circumstances of abuse, or that were suspicious of abuse, had sustained previous physical injuries. These injuries were either not known until after the child's death or were not identified as possible inflicted injury prior to the death. The previous injuries were identified at the time of the child's presentation to hospital after the fatal incident, through post-mortem examinations, or as part of the investigation into the death. Injuries included facial and head injuries, fractures, bruising, internal lacerations, haemorrhage, and trauma of varying ages.

Three of the children were infants under one, and the other was a young child. All but one of the children had previously been presented to a health facility with a physical injury. Our reviews identified possible concerns about these prior presentations in each of the three cases. In one matter, and after consulting with police, we decided to await the outcome of criminal proceedings before seeking further advice from NSW Health. Action taken for the other two matters is discussed below.

165. NSW Health 2010. Children of parents with a mental illness (COPMI) framework for mental health services. Policy Directive PD 2010\_037. NSW Health, Sydney.

166. NSW Ombudsman 2017. Report of Reviewable Deaths in 2014 and 2015, Volume 1: Child Deaths, June 2017. NSW Ombudsman, Sydney.

167. Ibid.

In November 2019, we referred the suspicious death of an infant to NSW Health for internal review. Two weeks prior to death, the child was taken to a hospital emergency department with a physical injury. A fracture was not identified at the time of presentation and was of a type that is often indicative of non-accidental injury. The child did not receive any follow up treatment for this injury. The Local Health District subsequently undertook an RCA review which made several recommendations about the follow up of imaging results.

In August 2020, the Clinical Excellence Commission completed an internal review using an expert panel to consider medical records, the Root Cause Analysis, and relevant policies and procedures. NSW Health provided a copy of their review to us in February 2021.

The review considered the need for a holistic approach to the care of children and a greater curiosity about the social circumstances of children and families, noting there were obstacles to clinicians being able to appreciate the full circumstances of a family. The review determined systems factors that could be implemented to improve child safety systems, develop the ability of clinicians to identify and respond to children at risk and to improve outcomes for children and families. The review made a number of recommendations, including state-wide radiology communication in cases of non-accidental injury, development of an alert system for vulnerable families in NSW electronic medical records, expanding child protection training to emergency department personnel, considering a review of the availability of Aboriginal Liaison Officers, and assessing the feasibility of a cross-agency health care record. The review was a constructive process which appears to have led to valuable proposed enhancements across the state-wide service system.

In late 2020, we referred a second suspicious infant death that occurred in 2018-2019 to NSW Health for internal review after an autopsy identified the presence of multiple non-accidental injuries. Three months prior to death, the infant was presented to a hospital emergency department with facial and other bruising. The cause of the injuries remained unexplained after investigations and the infant was discharged home with a safety plan and supervision arrangements in place. The infant was not presented for a scheduled review and died two weeks later. At the time of writing, we are awaiting the outcome of NSW Health's internal review.

### **10.5.3. Child protection as a shared responsibility**

Our previous reports of reviewable child deaths have consistently highlighted the need for greater coordination between the child protection, education, health and justice sectors, and the importance of early assessment and intervention, and effective coordination and collaboration between agencies working with families with complex needs. When multiple agencies are providing a service, with each targeting different needs or aspects of family functioning, it can be challenging for any one agency to understand the family's overall needs and holistically review the effectiveness of service interventions/casework strategies to meet these. Collaborative approaches to service delivery are a critical component of shared responsibility, and a pre-condition for effective service responses to vulnerable families whose complex needs cannot be met by any one agency.



## Case study: Interagency collaboration and coordination

In 2019, the NSW Coroner published findings from an inquest into the murder-suicide deaths of a mother and her young child in 2015.<sup>168</sup> Our investigation of the case informed the Coroner's findings and illustrates some of the issues that may arise in complex cases where multiple agencies need to provide support.

The child and family had complex needs. As a result, the family was provided with a high level of support from several agencies. In this context, it was important that the actions of all involved agencies were coordinated and informed by the interventions, strategies, identified issues, and outcomes of work by other involved agencies. Our investigation found that this was not the case. Despite the family's significant contact with services, we found that none of the involved agencies sought to bring all the parties together to:

- Clarify the roles and responsibilities of each agency
- Discuss the child protection risks and how these would be monitored and escalated if required
- Discuss what and when information needed to be shared between agencies, and
- Agree on a plan for coordinating the provision of services.

There was inadequate communication between relevant services about the progress and outcome of respective service interventions. As a result, it appeared that agencies often made assumptions about the nature, effectiveness, and protective impact of work by other agencies.

Some practitioners tended to respond to changes in family circumstances by making new referrals, rather than reviewing the effectiveness of existing interventions or therapeutic strategies, then adjusting the intensity or focus as indicated. Although it was not always evident what improvements were being achieved by the involvement of multiple services, it appears that for some practitioners, the number of services involved was in and of itself considered protective for the child. The circumstances of the child's death resulted in internal reviews by involved agencies, and interagency discussions to identify barriers to good practice and strategies for change.

Our investigation focused on practice issues and lessons to be learned in relation to interagency practice – and in particular:

- The need to keep children and child protection risks at the forefront of service provision that is working to resolve parental vulnerabilities
- The importance of interagency communication and coordination of service delivery to families with complex needs in the context of individual services being engaged to target discrete aspects of a family's function
- How the principle of shared responsibility should apply in situations of multi-agency involvement, intervention, and activity.

The Coronial inquest considered remedial action taken by three agencies in response to issues identified and recommendations made in the Ombudsman's investigation. The Coroner accepted evidence provided by the agencies at the time about initiatives and improvements they had implemented in response to our recommendations and the coronial investigation and declined to make further recommendations.

168. Coroners Court NSW 2020. Inquest into the deaths of TC and SN. Accessed from [https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2019/TC\\_\\_SN\\_-\\_Findings\\_-\\_redacted.pdf](https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2019/TC__SN_-_Findings_-_redacted.pdf) on 18 February 2021.

More recently (June 2020), the NSW Coroner's Court published findings from an inquest into an abuse-related death of a vulnerable child.<sup>169</sup> The child was drowned by her mother who had relapsed into an acutely psychotic state. Our review of this death identified issues with how DCJ, NSW Health, and a private practitioner collectively managed and responded to the mother's mental health and the impact of this on the child's safety and wellbeing prior to the death. The issues we identified in relation to the adequacy of care provided were, in the main, acknowledged by both DCJ and NSW Health in their respective internal reviews of the case. Both agencies identified significant gaps in service delivery and systems improvement opportunities and made recommendations to address issues identified within their agency.

The coronial inquest focused on the management of risk to a child where a parent has an acute mental health disorder, mental health care coordination, and shared care between a General Practitioner and Local Health District Mental Health Team. The Coroner found there were significant failures by the agencies providing care to the family and made recommendations that emphasised the importance of intra-agency communication and interagency consultation and information sharing. The recommendations included, among others, that the Ministry of Health consider reviewing the adequacy of existing policies to identify where guidance can be strengthened to emphasise the need for clear and regular communication and clear lines of responsibility between Local Health Districts and general practitioners where a consumer's mental health care is shared. At the time of writing, NSW Health had not yet provided a formal response to these recommendations.<sup>170</sup>

## 10.6. Observations and Recommendations

Our reviews of abuse and neglect-related deaths in 2018 and 2019 continue to highlight practice and systems issues within agencies that need to be addressed to ensure better protection of children and improved support of vulnerable families.

The NSW service system for vulnerable families, including early intervention and family support, statutory child protection, and out-of-home care, is complex. Responsibilities for the protection of children and support for vulnerable families is shared across numerous government and non-government providers, and services are delivered through multiple program areas.

The challenges affecting this system and identified in our reviews of deaths in 2018 and 2019 are in the main not new. Our work in child deaths – and more broadly under the *Community Services (Complaints, Reviews and Monitoring) Act 1993* over the past decade – has highlighted systemic issues in the provision of services for vulnerable children and families, and the existence of persistent challenges in child protection. These challenges include:

- Limited capacity of the system to respond to children at risk of significant harm, and the premature closure of child protection cases 'due to competing priorities'
- The need for a better understanding of the impact and effectiveness of early intervention programs, and
- Achieving outcomes for vulnerable families in the context of 'shared responsibility'.

It is concerning that despite the implementation of various sector reforms and initiatives over many years in the areas of community services and child protection that attempt to target these challenges, our child death reviews indicate much more work is still needed.

169. Coroners Court NSW 2020. Inquest into the death of A.P. Accessed from [https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2020/Findings\\_-\\_Inquest\\_into\\_the\\_death\\_of\\_AP\\_-\\_Redacted.pdf](https://coroners.nsw.gov.au/coroners-court/download.html/documents/findings/2020/Findings_-_Inquest_into_the_death_of_AP_-_Redacted.pdf) on 18 February 2021.

170. NSW Department of Communities and Justice. Government responses to Coronial Recommendations. Accessed from <https://www.justice.nsw.gov.au/lrb/Pages/coronial-recommendations.aspx> on 4 May 2021.

### 10.6.1. Case coordination, collaboration and information sharing remains an area of concern

Our reviews of abuse and neglect-related deaths in 2018 and 2019, and the findings of recent coronial inquests in 2019 and 2020 (discussed above), indicate more still needs to be done by agencies in this area. We will continue to monitor evidence of changes in agency practice and their responses to current coronial recommendations through our reviews.

### 10.6.2. Premature closure of high-risk cases

Our reviews of deaths in 2018 and 2019, as well as internal reviews conducted by DCJ of its involvement with families where a child died in circumstances of abuse or neglect, have frequently identified the premature closure of ROSH reports and cases by DCJ as an issue of concern. In a recent submission to the NSW Parliamentary Inquiry into the Child Protection and Social Services System we noted that information published by DCJ shows that, in the 12 months to 30 June 2019, the overall average percentage of children reported at ROSH who were ‘seen’ by a caseworker was around 29%.<sup>171</sup> We also noted that it has been some years since DCJ reported publicly on the number of cases it closes ‘due to competing priorities’.

Our concerns about the premature closure of child protection reports – observed through our death reviews and examination of coronial inquests held in relation to reviewable child deaths – have not changed. It is apparent that demand exceeds available resources in this area, and DCJ finds it necessary to prioritise cases. However, the fact remains that this system requires judgements about which children – of those assessed as reaching the threshold of being at risk of significant harm – receive a response.

We therefore recommend:

**The Department of Communities and Justice:**

- a. **Detail the actions it is taking at a strategic level to address the premature closure of ROSH reports due to competing priorities, including cases closed without comprehensive assessment or face-to-face contact, and where referrals are made (in place of an assessment).**
- b. **Advise us of the findings and outcomes of its review of existing policy and practice mandates around case closure, as recommended by the Deputy State Coroner in June 2020, and actions it is taking to address these.**
- c. **Detail the outcomes of its review of practice mandates and policies in relation to the triage, allocation of ROSH reports, and closure of ROSH reports, as described in the March 2021 coronial inquest into the death of Z.**

**Advice regarding each of these points should be provided to us by 17 December 2021.**

We also recommend:

**The Department of Communities and Justice advise us about any actions it is taking to record the outcome of referrals made when ROSH reports are not prioritised for comprehensive assessment, as well as actions it is taking, if any, to introduce a prompt to review DCJ’s response to ROSH reports where referrals are unable to be allocated by service providers.**

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171. NSW Ombudsman 2021. Submission to the Inquiry into the Child Protection and Social Services System. NSW Ombudsman, Sydney.

### 10.6.3. Methadone deaths require close monitoring

Deaths of children from methadone toxicity are preventable. Noting our previous work in this area and NSW Health's previous advice to us in 2010 about their audits of takeaway methadone doses, discussed above, we recommend:

#### **NSW Health**

- a. **Outline its current processes for ongoing auditing of prescriber compliance with the NSW Clinical Guidelines: Treatment of Opioid Dependence (2018), including how prescribers are applying guidance regarding safe prescribing of opioid treatment medications for clients with children in their care.**
- b. **Provide us with a copy of any review by the Centre for Alcohol and Other Drugs of prescriber practices in incidents where a child has presented to a hospital with methadone or buprenorphine poisoning in the period 2018-2020.**
- c. **Describe and outline any risk assessment guidance it provides to authorised prescribers, in addition to information included in the Guidelines, including any information provided for prescribers to consider a patient's overall caring responsibilities (for example grandparents or others who may provide occasional care to children).**
- d. **Clarify whether the revised Opioid Treatment Accreditation Course includes a child protection component.**

**This information should be provided by 17 December 2021.**

# Appendices

## Appendix 1: NSW Child Death Review Team

### Members (as at May 2021)

#### Statutory members

**Mr Paul Miller**

Convenor  
NSW Ombudsman

**Ms Zoe Robinson**

NSW Advocate for Children and Young People

#### Agency representatives

**Assistant Commissioner Scott Cook**

Police Prosecutions and Licensing Enforcement  
Command, NSW Police Force

**Ms Eloise Sheldrick**

Coordinator and Assistant Coroner,  
Coronial Information and Support Program  
Office of NSW State Coroner

**Ms Sarah Bramwell**

Director Practice Learning,  
Office of the Senior Practitioner  
Department of Communities and Justice

**Ms Lisa Alonso Love**

Executive Director Learning and Wellbeing,  
Educational Services, Department of Education

**Mr Ben Spence**

Executive District Director,  
Hunter & Central Coast District,  
District and Youth Justice Services,  
Department of Communities and Justice

**Dr Matthew O'Meara**

Chief Paediatrician, NSW Ministry of Health  
Staff Specialist Paediatric Emergency Medicine,  
Sydney Children's Hospital

**Mr Matthew Karpin**

Director, Criminal Law Specialist  
Policy, Reform and Legislative Branch  
Department of Communities and Justice

#### Independent experts

**Professor Ngiare Brown**<sup>172</sup>

Director and Program Manager  
Ngaoara Child and Adolescent Wellbeing

**Professor Kathleen Clapham**<sup>173</sup>

Deputy Convenor  
Professor Indigenous Health,  
Australian Health Services Research Institute  
University of Wollongong

**Dr Susan Adams**

Senior Staff Specialist, General Paediatric  
Surgeon and Head of Vascular Birthmarks  
Service, Sydney Children's Hospital

**Dr Susan Arbuckle**

Paediatric and perinatal pathologist  
The Children's Hospital at Westmead

**Dr Isabel Brouwer**

Statewide Clinical Director  
Department of Forensic Medicine

**Dr Luciano Dalla-Pozza**

Head of Department (Cancer Centre for  
Children), Senior Staff Specialist (Paediatric  
Oncology), The Children's Hospital at Westmead

**Dr Bronwyn Gould**

General Practitioner

**Professor Philip Hazell**

Child and Adolescent Psychiatrist, Sydney Local  
Health District, Conjoint Professor of Child and  
Adolescent Psychiatry, The University of Sydney  
School of Medicine

**Professor Heather Jeffery** (Honorary)

International Maternal and Child Health  
University of Sydney/Royal Prince Alfred  
Hospital

**Professor Ilan Katz**

Professor, Social Policy Research Centre  
University of NSW

**Ms Catherine Lourey**

Commissioner  
Mental Health Commission of NSW

172. Appointed by the Minister under section 34C (7) as an Aboriginal person within the meaning of the *Aboriginal Land Rights Act* 1983.

173. Ibid.

## Previous members (June 2019 to May 2021)

**Mr Michael Barnes** (to August 2020)  
NSW Ombudsman

**Mr Steve Kinmond** (to January 2019)  
Community and Disability Services Commissioner

**Mr Andrew Johnson** (to December 2019)  
NSW Advocate for Children and Young People

**Ms Kate Alexander** (to July 2019)  
Executive Director  
Office of the Senior Practitioner  
Department of Communities and Justice

**Ms Clare Donnellan** (to June 2019)  
District Director, South Western Sydney  
Department of Communities and Justice

**Ms Robyn Bale** (to September 2019)  
Director, Student Engagement and Interagency  
Partnerships, Department of Education

**Associate Professor Elisabeth Murphy** (to June 2019)  
Senior Clinical Advisor, Child & Family Health  
NSW Health

**Ms Larisa Michalko** (to June 2020)  
Director, Criminal Law Specialist  
Policy and Reform Branch  
Department of Communities and Justice

## Expert advisers

Part 5A of CS-CRAMA provides for the Convenor to appoint persons with relevant qualifications and experience to advise the CDRT in the exercise of its functions. Expert advisers who assisted the CDRT in its work, and/or who undertook research on behalf of the CDRT during the two-year period 2018-2019 include:

**Professor Les White**  
former NSW Chief Paediatrician and CDRT member for NSW Health

**Dr Lorraine du Toit-Prinsloo**  
Senior Staff Specialist, Clinical Training Coordinator, Forensic Medicine Newcastle

**Ms Kyra Parry-Williams**  
Acting Coordinator Coronial Information and Support Program, Coroner's Court of New South Wales

**Dr Daniel Challis**  
Executive Medical Advisor Obstetrics, NSW Perinatal Services Network; Director Women's and Children's Health, South East Sydney Local Health District; Conjoint Associate Professor, University of NSW

**Dr Julie Brown**  
Senior Research Scientist, Neuroscience Research Australia

**Dr Fadwa Al-Yaman**  
Group Head, Australian Institute of Health and Welfare (AIHW)

**Ms Tracy Dixon**  
Unit Head, Australian Institute of Health and Welfare

**Dr Prem Thapa**  
Senior Project Manager, Australian Institute of Health and Welfare



## Appendix 2: Monitoring previous recommendations

A key function of both the CDRT and NSW Ombudsman, as outlined in sections 34D (1)(e) and 36 (1) (b) of CS-CRAMA respectively, is to make recommendations as to legislation, policies, practices, and services that could be implemented by government and non-government agencies and the community to prevent or reduce the likelihood of child deaths.

In addition to the new recommendations made in this report, we continue to monitor agency progress in implementing some of our earlier recommendations.

The *NSW Child Death Review Team Annual Report 2019-20* provides detailed information about the progress agencies reported to us in 2020 regarding CDRT recommendations.<sup>174</sup> The NSW Ombudsman is also required to include information about any recommendations made, and details regarding the implementation or otherwise of previous recommendations, in its biennial reports.

A list of previous CDRT and NSW Ombudsman recommendations that remain open, and in respect of which we continue to monitor agency progress, is set out below. The forthcoming *NSW Child Death Review Team Annual Report 2020-21*, which will be published in late 2021, will include information about progress agencies reported to us in 2021 regarding CDRT recommendations.

### Previous NSW Child Death Review Team recommendations

#### Sudden Unexpected Death in Infancy (SUDI): investigation

##### **Recommendation 3, Child Death Review Report 2015<sup>175</sup> (published November 2016):**

The NSW Government, in the context of previous CDRT recommendations and the work of Garstang et al<sup>176</sup> should devise a joint agency policy and procedure governing the individual and coordinated roles and responsibilities of NSW Health, the NSW Police Force and the NSW Coroner in SUDI investigation. The policy and procedure should incorporate all elements of a joint agency response to SUDI:

- (c) Identified specialists to take the SUDI medical history, and review of the SUDI medical history form and the immediate post-mortem findings to enable further specific history taking where necessary; and
- (e) The conduct of SUDI post-mortems by specialist paediatric pathologists. Minimally, where post-mortems are not conducted by paediatric pathologists, there should be consultation with paediatric specialists.

#### Sudden Unexpected Death in Infancy: safe sleeping in vulnerable families

##### **Recommendation 1, Biennial report of the deaths of children in NSW: 2016 and 2017<sup>177</sup> (published June 2019):**

NSW Health should develop and implement strategies to promote safe infant sleep practices to vulnerable families. In particular, NSW Health should target:

- In consultation with the Department of Family and Community Services, families known to child protection services
- Families living in remote areas of the state, and
- Families living in areas of greatest socio-economic disadvantage.

174. NSW Child Death Review Team 2020. *NSW Child Death Review Team Annual Report 2019-20*. NSW Ombudsman, Sydney.

175. NSW Child Death Review Team 2016. *NSW Child Death Review Team Annual Report 2015*. NSW Ombudsman, Sydney.

176. Garstang J, Ellis C, & Sidebotham P. (2015). An evidence-based guide to the investigation of sudden unexpected death in infancy. *Forensic Science, Medicine and Pathology* 11, 345-57.

177. NSW Child Death Review Team 2019. *Biennial report of the deaths of children in New South Wales: 2016 and 2017. Incorporating reviewable deaths of children*. NSW Ombudsman, Sydney.

## Sudden Unexpected Death in Infancy: identification of illness in infants

### **Recommendation 2, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

NSW Health should undertake a campaign to promote resources (including fact sheets, websites, apps, and phone lines) that aim to assist parents and carers to identify illness in infants. The campaign should focus on resources that are evidence-based and have been subject to evaluation.

## Drowning: publication of annual data from the swimming pool register

### **Recommendation 10, Child Death Review Report 2015 (published November 2016):**

The Office of Local Government (now Department of Customer Service) should publish annual data from its analysis of the swimming pool register, including but not limited to:

- a) the number of pools registered
- b) the number of pools that have been inspected
- c) the proportion of inspected swimming pools that were deemed non-compliant with the Act at the time of inspection
- d) the main defects identified at the time of inspection, and
- e) whether or not owners have rectified defects within a reasonable period of time.

## Transport-related fatalities: safer vehicle choices

### **Recommendation 3, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

Transport for NSW (Centre for Road Safety) should include, as part of the *Safer Vehicle Choices Save Lives* campaign website, a page targeted at young drivers purchasing a vehicle. This should detail the features and vehicles to consider when purchasing the safest car in a range of price brackets – similar to the ‘*how safe is your first car?*’ website (Victorian Transport Accident Commission).

## Transport-related fatalities: child restraints and seatbelts

### **Recommendation 4, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

In the context of the findings a 10-year review of the role of seatbelts and child restraints in the deaths of 66 child passengers aged 0-12 years in vehicle crashes, we recommended that:

Transport for NSW should undertake a study of child restraint practices in NSW. The study should have a particular focus on areas of socio-economic disadvantage and those outside major cities.

## Transport-related fatalities: quad bikes

### **Recommendation 9, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

SafeWork NSW should establish a specific focus on children within the Quad Bike Safety Improvement Program. The program should strongly promote the message that children under 16 years of age should not operate, or be a passenger on, an adult quad bike under any circumstances or for any reason.

## Suicide deaths: focused prevention plan, managing and containing risk

### **Recommendations 10 and 11, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

The NSW Government should include in any suicide prevention plan specific measures targeted to school-aged children and young people across the spectrum of need. In particular, this should include:

- a) universal strategies that promote wellbeing in children and young people
- b) early intervention designed to arrest emerging problems and difficulties

- c) the provision of targeted, sustained and intensive therapeutic support to young people at high risk – including strategies for reaching those who are hard to engage.

The NSW Government should direct funds associated with the Strategic Framework for Suicide Prevention in NSW 2018 – 2023 to address gaps in the delivery of appropriate specialist mental health services for children and young people in NSW.

### **Suicide deaths: the role of schools – ongoing monitoring and evaluation**

#### **Recommendation 12, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

Noting that the role of schools – both government and non-government – is critical in developing strategies to prevent suicide, and that strategies should be evidence-based and subject to ongoing monitoring and evaluation, we recommended that:

The NSW Department of Education should evaluate postvention initiatives in NSW government high schools, particularly the effectiveness of such initiatives in preventing suicide clusters.

### **Suicide deaths: the role of schools – review following suicide**

#### **Recommendation 15, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

The NSW Department of Education should establish a process of review after the suicide death of a child or young person in a public school. The process should involve considering, with the local school and district, the involvement of the school with the young person and their family – particularly in terms of identifying and responding to mental health or suicidal risk behaviours. Outcomes of the reviews should inform future practice and policy.

## **Previous NSW Ombudsman recommendations: reviewable child deaths**

### **Suicide deaths: young people in care**

#### **Recommendation 16, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

In the context of the over-representation of young people with a child protection history in suicide deaths, and advice from the Department of Communities and Justice that it uses an ‘Alternate Assessment Tool’ to assess risk of significant harm reports in certain cases, including where a child or young person is in care, and that this tool was under review, we recommended that:

FACS provide a copy of the finalised Alternate Assessment Tool, including advice as to how changes will assist FACS’s staff to understand and respond to reports of risk of significant harm for children and young people in care, where those reports raise concerns about mental health, self-harm and/or suicidal behaviours.

### **Abuse and neglect-related deaths: carer mental illness**

#### **Recommendation 17, Biennial report of the deaths of children in NSW: 2016 and 2017 (published June 2019):**

Against the background of issues identified through our reviews about the effectiveness of current strategies and initiatives to ensure comprehensive and appropriate clinical practice and competency in relation to recognising and responding to potential risk to children of parents with mental illness, and in light of NSW Health’s advice about the development of a new policy framework and accompanying implementation monitoring plan, we recommended that:

NSW Health, as part of the planned implementation of the Family Focused Recovery Framework 2019-2023, should develop an evaluation strategy to ensure the benefits of the framework can be measured and adjusted as needed.

# Appendix 3: Methods

## Baseline measurements

The report methodology is underpinned by survey data and estimates produced by the Australian Bureau of Statistics (ABS).

## Population estimates

The comparative population size for mortality rate calculations are sourced from a range of ABS reports, including tables we specifically requested from the ABS and supplied to order on a fee-for-service basis.<sup>178</sup>

The base populations of children by sex and single year of age in NSW between 2005-2019 were taken from the ABS Estimated Residential Population September 2019 release.<sup>179</sup>

The base populations by Remoteness and Socio-economic Index (SEIFA) as Index of Relative Disadvantage (IRSD) quintiles were taken from a table supplied to order by ABS.<sup>180</sup> The most recent figures available were for 2018 and 2019.

Infant Mortality Rates were calculated from the number of live births in NSW in 2019,<sup>181</sup> including breakdowns for Aboriginal and Torres Strait Islander births, and deaths by remoteness area. The estimated population of children below one year of age by socio-economic quintile (IRSD) was used as a proxy for number of births by quintile. This was sourced from a table supplied to order by ABS.<sup>182</sup>

Population estimates for all Aboriginal and Torres Strait Islander children were sourced from the ABS publication *'Estimates of Aboriginal and Torres Strait Islander Australians'* which is based on data from the 2016 census.<sup>183</sup>

## Remoteness

The breakdown of population by age categories and by remoteness areas as of 30 June 2016 was supplied by the ABS to order. The delimitation criteria for remoteness areas are based on the Accessibility/ Remoteness Index of Australia (ARIA+).<sup>184</sup> The ARIA+ Index is a measure of access to services using proxy measures of distance to the five nearest centres of defined populations.<sup>185</sup>

The product supplied by the ABS contains estimates of the resident populations (ERPs) by 2016 Statistical Area Level 1 (SA1) derived areas of Australia, produced by the ABS. These estimates correspond with the preliminary 30 June 2014 ERP as released in *Regional Population Growth, Australia, 2013-14* (cat. no. 3218.0) and *Population by Age and Sex, Regions of Australia 2014* (cat. no. 3235.0). The SA1 and SA1-based ERPs are not standard ABS output, but rather are customised data available for purchase as an information consultancy. These estimates are not published on the ABS website.

The ABS changes the boundaries of its underlying geographic spatial structures over time. Consequently, geographic patterns may have changed slightly across time and from previous reports. While it is likely that the changes are minimal at the level of remoteness grouping (a high level of grouping), caution should be applied when analysing and interpreting changes through time.

The categorisation of remoteness areas and socio-economic groupings was done through direct translation of the latitude and longitude coordinates of the address of usual residence. This enables the most accurate categorisation of usual residence using the ASGS. In this report, the measures have been combined for regional and remote areas including the ARIA+ categories of inner and outer regional areas, along with remote and very remote areas combined.

## Relative socio-economic status

Socio-economic status refers to the relative access to material resources of an individual or group. The indicator of the socio-economic status of a child used in this report is the Index of Relative Social Disadvantage (IRSD) of the area in which a child usually lived. IRSD status is reported in quintiles. Quintile 1 represents the relatively most disadvantaged 20%, and quintile 5 represents the relatively least disadvantaged 20%.

Another measure of socio-economic status used in the report is the Index of Education and Occupation of the area in which a child usually lived. The IEO reflects the general level of education and occupation-related skills of people within an area. In this report, IEO measures reflect the general level of parental/carer qualifications achieved and occupation category. The index reports 'low' and 'high' measures of education and occupation. For example, a low score on the IEO index indicates relatively lower education and occupation status of people in the area in general. Both IRSD and IEO are measures of socio-economic conditions by geographic area that the Australian Bureau of Statistics generates.<sup>186</sup>

In this report, socio-economic status is not included in calculations for children whose usual residence was outside of the state or overseas, or for those children where insufficient information was available about their usual place of residence. In 2018 and 2019, 10 children did not have an IRSD and IEO score and six children did not have an ARIA score.

## Reporting categories

In relation to cause of death, individual cases – apart from deaths classified as Sudden Unexpected Death in Infancy (SUDI) – are reported against a specific category within the report. SUDI is not a cause of death. For this reason, SUDI cases with known underlying causes of death are also reported in the sections relating to those underlying causes. Additionally neglect-related deaths are not reported as a cause of death but are mentioned in the relevant chapters related to their cause of death reporting category.

For natural cause deaths, reporting categories align with chapter levels of the International Statistical Classification of Diseases and Related Health Problems (ICD). This is also generally (but not always) the case for external cause deaths, where precedence may be determined according to the most appropriate category for considering prevention.

## Causes of death

In this report, underlying cause of death is reported using ICD-10 (International Statistical Classification of Diseases and Related Health Problems, 10th revision).<sup>187</sup> The ICD-10 has more than 12,000 unique codes in more than 2,000 categories. The highest-level classification is the chapter level (22 chapters). ICD-10-AM is the Australian modification of ICD-10.<sup>188</sup>

Underlying cause of death is defined by the World Health Organization as the *'disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury'*. Unless otherwise indicated, in this report the cause of death relates to underlying cause. The underlying cause of death is recognised as the single most essential element to understanding causes of death.<sup>189</sup>

Direct cause of death is the final condition or event that results in death. Antecedent causes of death are conditions that have given rise to the direct cause of death. Other significant causes of death are conditions or events that were present during the sequence leading to death but may not have been necessary influences.

**Table 7. Natural causes of death**

Name	Description	ICD codes
Certain conditions originating in the perinatal period	Includes conditions such as prematurity; complications of labour, including hypertension and maternal haemorrhage; and disorders associated with foetal growth. It may also include certain respiratory, cardiovascular, and infectious diseases associated with the perinatal period, such as aspiration of meconium and respiratory distress of the newborn.	P00-P96
Congenital malformations and chromosomal abnormalities	Includes a range of conditions, including congenital cardiac anomaly, trisomy 18 (Edwards syndrome), and Down syndrome.	Q00-Q99
Neoplasms	Cancers and tumours.	C00-D48
Diseases of the nervous system	Includes disorders such as epilepsy, cerebral palsy and muscular dystrophy, as well as inflammatory and degenerative conditions.	G00-G99
Diseases of the respiratory system	Includes conditions such as pneumonia, influenza, and asthma.	J00-J99
Endocrine, nutritional and metabolic diseases	Includes conditions such as diabetes, malnutrition, and mitochondrial disorders.	E00-E89
Diseases of the circulatory system	Includes conditions such as cardiac and blood vessel diseases or circulatory disorders.	I00-I99
Certain infectious and parasitic diseases	Infectious diseases are caused by organisms such as bacteria, viruses, parasites, or fungi, and can be passed directly or indirectly from person to person. Examples include influenza, gastroenteritis, and meningococcal disease.	A00-B99
Other chapters of ICD-10	Includes: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism; Mental and behavioural disorders; Diseases of the eye and adnexa; Diseases of the ear and mastoid process; Diseases of the digestive system; Diseases of the skin and subcutaneous tissue; Diseases of the genitourinary system; and Pregnancy, childbirth, and the puerperium.	D50-D89, F00-F99, H00-H59, H60-H95, K00-K93, L00-L99, N00-N99, O00-O99



**Table 8. External causes of death**

Name	ICD codes	Notable inclusions
Drowning	W65-W74, Y21	
Fatal assault	X85-Y09	Assault involving drowning (X92), or a motor vehicle (Y02-Y03) would be included with deaths from fatal assault.
Suicide	X60-X84	Includes intentional crashing of a vehicle and intentional self-harm by drowning.
Transport	V01-V99, Y31-Y32	
Other unintentional external cause death		Unintentional external cause deaths that are not due to transport 'fatalities or drowning, for example poisoning, threats to breathing, struck by object, fires and falls.

## Identification of Aboriginal and Torres Strait Islander children

Individual children are identified as Aboriginal or Torres Strait Islander if:

- The child has been identified as either Aboriginal or Torres Strait Islander on their NSW Births Deaths and Marriages (BDM) death certificate.
- The child or their parent/s have been identified as either Aboriginal or Torres Strait Islander on their NSW BDM birth certificate.
- Agency records identify the child as Aboriginal or Torres Strait Islander through several records, which are corroborative. Records used to do this include the NSW Police Computerised Operational Policing System (COPS), and Communities and Justice *ChildStory* database, which often hold information that can support Aboriginal or Torres Strait Islander identity. NSW Health, Education, and other agency records are also used to assess the child and family background.

## Data description

The child death register records information on all children whose deaths occurred in NSW, including whether any of the children were Aboriginal or Torres Strait Islander. Data on Aboriginal and Torres Strait Islander status is compiled from a range of sources. The number and source of the records is partially dependent on the cause of death for each child. Some sources in the list below are requested for every child, and some are only requested where applicable. Record requests can take some time after a death has been registered, and information is added as it becomes available. Data published in this report for Aboriginal and Torres Strait Islander status and mortality rates are therefore subject to change.

## Changes since 2013

In line with recommendations by the Australian Institute of Health and Welfare (AIHW), the CDRT's process for collecting Aboriginal and Torres Strait Islander status for the register changed in 2013.<sup>190</sup> Previously, information from BDM was used as the primary source, with other sources considered where records clearly indicated the child was Aboriginal or Torres Strait Islander.

Identification of the child's Indigenous status was based on expert assessment of the information. However, information from sources other than BDM was not held in the register – reporting was based on a single data field that contained the final decision.

From 2013 onwards, information about a child's Aboriginal or Torres Strait Islander status has been collected from all sources available for each case. Business rules have been applied to assign Aboriginal and Torres Strait Islander status for each child. Where a child has been identified as Indigenous in any source collected by the CDRT during the case review, the child has been nominated as Aboriginal and/or Torres Strait Islander in the register and the case reported as such.

190. Australian Institute of Health and Welfare 2013. Identification and reporting of Aboriginal and Torres Strait Islander Children by the New South Wales Child Death Review Team, Advisory Report. Australian Institute of Health and Welfare, Canberra.



For reporting on trends in deaths over time, only BDM birth and death data has been used. BDM data is the primary source for Indigenous status and should be used exclusively to analyse trends to avoid compounding errors from differences in accuracy of secondary data sources through time. BDM data has been used for reporting all trends in deaths over time.

### List of sources of Aboriginal and Torres Strait Islander status

- BDM death
- BDM birth
- National Coronial Information System (NCIS)
- Other coronial records
- Police databases (COPS/PODS)
- Other police records
- Education records
- NSW Health records
- Communities and Justice (KiDS and *ChildStory*)
- Other community service agency records
- CWU database – Wellnet
- Other CWU records
- GP/private practitioner records
- NGO records

### Other sources

There were a variety of data sources utilised to identify Aboriginal and Torres Strait Islander children who died in 2018 and 2019. Of the 140 children who were identified as Aboriginal and/or Torres Strait Islander in the two years, 114 (81%) were identified by two or more sources. The remaining 26 (19%) children were identified as Aboriginal and/or Torres Strait Islander by only one source. Of the 140 children, 94 (67%) were identified in BDM and other records. BDM information (birth and/or death certificates) was the only source of identification for 22 children, 14 of whom were identified using a single BDM source (birth or death certificate). There were 24 children identified as Aboriginal and/or Torres Strait Islander only by sources other than BDM.

**Table 9. Sources of Aboriginal and Torres Strait Islander identification, NSW 2018-2019**

Decision	Source	Total source(s)	Number of children
Aboriginal and Torres Strait Islander	BDM Birth only	1	5
	BDM Death only	1	9
	BDM Birth & BDM Death only	2	8
	BDM & other sources	2	16
		3	30
		4	21
		5	16
		6	5
		7	4
		8	1
		9	0
		10	1
		Other source(s) only	1
	2		10
	3		1
4	1		
<b>Total</b>		<b>140</b>	
non-Indigenous	BDM & other sources		849
<b>Total</b>	<b>Total</b>		<b>989</b>

## Statistical analysis

### Mortality rates

The child mortality rates were calculated as rates per 100,000 persons, an unadjusted crude rate. This was done by dividing the number of deaths in a given category by the population that was appropriate for the category. For example, the mortality rate for deaths of children from all causes in 2018 was  $(517/1773114 \times 100,000) = 29.16$ . The mortality rate was calculated for different age ranges depending on the chapter, such as the total sample aged 0-17 for injury-related deaths, for children aged 1-17 years for natural cause deaths and for children aged 10-17 years for suicide deaths.

Infant Mortality Rates (IMR) are calculated as rates per 1,000 live births. The number of infant deaths in a given category is divided by the total number of live births for the year and multiplied by 1,000. For example, in 2018 the IMR for infants (under 1 year)  $(272/107343 \times 1,000) = 2.53$ . Where reporting infant deaths IMR are reported unless otherwise stated.

Mortality rates were not calculated where there were less than four deaths.

### Confidence intervals

A confidence interval is a quantitative estimate of the uncertainty of a statistic. It is used in this report primarily to test for significant differences in the Child Mortality Rate or Infant Mortality Rate. The 95% confidence interval estimates the range of values in respect of which there is 95% certainty that the range contains the true population mean.

If the number of observed cases was less than 100, confidence intervals were calculated directly from the Poisson distribution – as recommended by the Washington State Department of Health.<sup>191</sup> When the number of cases was 100 or more, the normal approximation was used to calculate the confidence intervals. The equation applied was:  $(\pm 1.96 \times (CMR \text{ or appropriate rate}) / \sqrt{(number \text{ of deaths})})$ .

### P-values

A *p*-value is a quantitative measurement of the likelihood that a statistic occurred by chance. A *p*-value of 0.05 means that there is only a 5% probability that the result obtained was due to a chance variation. A *p*-value of 0.05 is the conventional level for statistical significance. *P*-values are valid only when the distribution of the observation is the same as, or very close to, the theoretical distribution used to calculate the statistic. All *p*-values noted in this report are statistically significant.

### Rate ratios

Rate ratios are a pairwise comparison of mortality rates. In this report, they were calculated to compare a range of demographic mortality rates such as males compared to females or Aboriginal/Torres Strait Islander compared with non-Aboriginal/Torres Strait Islander rates. T-test significance testing was conducted comparing the mortality rates by demographic groups for the 2005-2019 period as a whole and the 2015-2019 period.

### Statistical Significance

This report examined differences in mortality rates and other factors for age, gender, Aboriginal and Torres Strait Islander children and non-Indigenous populations. We examined changes in trend for crude mortality rates (CMR) between three time periods (2005-2009, 2010-2014, 2015-2019) and for other periods when stated. The initial analysis of trend was performed using 95% confidence intervals (CIs) as statistical tests in alignment with the Washington State Department of Health Guidelines. Using this method, if the confidence intervals of two groups' mortality rates overlap, then it is deemed that there is not enough evidence to indicate that the rates are significantly different, and vice versa.

191. Washington State Department of Health 2012. Guidelines for Using Confidence Intervals for Public Health Assessment. Washington State Department of Health, Olympia, WA. Accessed from <http://www.doh.wa.gov/Portals/1/Documents/1500/ConfIntGuide.pdf> on 30 November 2020.

There are three distinct contexts where confidence intervals are used as statistical tests throughout the report:

1. The CIs for the three consecutive 5-year periods were compared pairwise to determine whether there was a significant trend over the 15-year period.
2. The CIs between two demographic groups (e.g., Indigenous peoples and non-Indigenous) for a given period (e.g., 2015-2019) were compared to see if there was a significant difference in mortality rate between the two groups during this period.
3. The CIs between two demographic groups (e.g., males and females) were compared over three consecutive 5-year periods to see if there was a significant difference in mortality experience between the two groups over the entire 15-year period. For this to be conclusive there had to be no overlap in CI intervals for all three periods.

As all the above tests were performed on two distinct samples, there is a conservative error to this method meaning that in the case when the CIs overlap, there is still a possibility that an appropriate statistical test would indicate a statistically significant difference. However, if two CIs do not overlap, a comparable statistical test would always indicate a statistically significant difference. As such, when there was no overlap of the relevant 95% CIs, significance was said to be established and when there was overlap, the test was deemed inconclusive.

When the initial statistical testing using CIs was found to be inconclusive, subsequent statistical tests were implemented. To determine if there was a trend over time without a significant result from the CIs, a Mann-Kendall test in conjunction with linear regression was performed for the given period (2005-2019 unless otherwise specified). The Mann-Kendall test was used to determine if there was a significant monotonic trend in mortality rates (and in some cases, proportions) over time. Autocorrelation and partial autocorrelation plots were generated to check that there is no serial correlation, and the independence assumption is satisfied. In the same contexts that the Mann-Kendall was performed, linear regression was implemented using 'Year' as a predictor variable for the mortality rate (or proportion) and the subsequent *p*-value was used to determine whether 'Year' was a significant predictor. Both tests were implemented in R using a significance level of 5%.

In addition to checking for a significant trend over time, linear regression was also used to establish if there was a significant difference in trend between two groups over a given period. This approach utilised the following explanatory variables; 'Year', a dummy variable reflecting which of the two groups the data had come from (e.g., 1 if female, 0 if male), and an interaction term between the 'Year' and dummy variable.

To test for statistical significance between two demographic groups beyond the CI comparison, t-tests were implemented to check for differences in the average mortality rates of two samples using a significance level of 5%. Chi-squared tests were used when examining the relationship between two variables. These tests aimed to check whether two categorical variables of interest were independent or whether there was evidence of a statistically significant relationship between these variables. For all tests, a significance level of 5% (or equivalently, a 95% confidence interval) was used, i.e., the null hypothesis was rejected only when the *p*-value was less than 5%.

## Software

Much of the data extraction and summarisation was done using Microsoft SQL Server 2016 and Microsoft Excel. Statistical analysis was performed using the Data Analysis Toolpak in Microsoft Excel and the R software environment.

## Appendix 4: SUDI classifications

Sudden Unexpected Death in Infancy (SUDI) is a classification that is applied to the death of an infant aged less than 12 months that is sudden and unexpected, where the cause was not immediately apparent at the time of death.

Around 14% of all infant deaths in NSW are SUDI.<sup>192</sup>

SUDI are either:

**Explained** – deaths where a cause is found after investigation.

**Unexplained** – deaths where the cause remains unidentified after all investigations are completed. This includes deaths that are classified as Sudden Infant Death Syndrome (SIDS).

All SUDI are coded using the International Classification of Diseases 10th edition (ICD 10). SUDI deaths that remain unexplained are then further classified by the CDRT. The following information about classification relates only to SUDI that are unexplained.

### Background

The most commonly accepted framework for classifying SUDI is ‘the San Diego definition’ adopted in 2004.<sup>193</sup> Since then, there has been a major shift in SIDS diagnosis, and a major advance in the identification of ‘modifiable risk factors’.<sup>194</sup>

In early 2015, the CDRT reviewed the Krous classification and developed an alternative system which considered key extrinsic risk factors (risks in the child’s environment that were modifiable at the time of the child’s death) and intrinsic risk factors (risks that were non-modifiable at the time of the child’s death).<sup>195</sup> The aim of the revised classification was to provide for a consistent approach to SUDI by coroners, pathologists and the CDRT. This classification was piloted and applied to deaths in 2016 and 2017, and is described in detail in our previous biennial report.<sup>196</sup>

In 2020, following feedback from the pilot, the CDRT amended the classification to the current proposal to better:

- separate the sufficiency of post-death investigations,
- separate deaths where an autopsy was performed,
- identify factors present prior to and following birth, and
- identify factors in the immediate environment at the time of the infant’s death.

### Classification of autopsy and investigation

Unexpected infant deaths and the quality of investigation undertaken are classified as to whether they received an autopsy and whether a sufficient investigation was conducted. It is crucial to note that the sufficiency of investigation is assessed against best practice for investigation of SUDI deaths in the particular jurisdiction in which the death occurs – see definitions below.

In summary, the classification identifies where matters received an autopsy, or an investigation, or both an autopsy and investigation.

192. NSW Child Death Review Team 2019. Biennial report of the deaths of children in New South Wales: 2016 and 2017, incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

193. Byard RW, Ranson D, Krous HF 2005. National Australian workshop consensus on the definition of SIDS and initiation of a uniform autopsy approach to unexpected infant and early childhood death. *Forensic Science and Medical Pathology*, 1(4), 289-92.

194. Mitchell E, Krous H 2015. Sudden unexpected death in infancy: a historical perspective. *Journal of Paediatrics and Child Health*, 51, 108-12.

195. Intrinsic risks include some preventable risks (e.g., maternal smoking) but the impact of these risks could not be changed at the time the child died.

196. NSW Child Death Review Team 2019. Biennial report of the deaths of children in NSW in 2016 and 2017, incorporating reviewable deaths of children. NSW Ombudsman, Sydney.

## Classification of factors present

The purpose of the CDRT's proposed classification change is to clarify definitions and identify factors that were present at the time of death. It is not necessary to establish any causal link between factors present and the death; the classification is intended only to record factors present, regardless of their contributory role.

The classification categorises:

- extrinsic factors (factors present in the environment that were modifiable at the time of the child's death)
- intrinsic factors (factors that were non-modifiable at the time of the child's death), and
- matters where both intrinsic and extrinsic factors were present.

## The classification is *not* a cause of death

The proposed classification is not a determination of cause of death. It is a method to allow for improved analysis of investigation and circumstances at the fatal incident or death event to inform prevention strategies.

## Structure of the classification

The structure is simple and intended to provide for a consistent approach to identifying factors present and circumstances involved in unexplained SUDI deaths to enable better assessment of related factors.

## The system uses extension codes

Extension identifiers for death investigation and autopsy	
.0	Unknown OR no autopsy and/or investigation
.1_	Autopsy only
.2_	Investigation only
.3_	Autopsy and investigation

Extension identifiers for proximal factors present	
._A	It is known there were <i>no</i> intrinsic and extrinsic factors present
._B	It is known there were intrinsic factors present
._C	It is known there were extrinsic factors present
._D	It is known there were <i>both</i> intrinsic and extrinsic factors present
._E	It is <i>not</i> known that there were any intrinsic or extrinsic factors present

Separating the depth of investigation and the factors present enables cross-referencing analysis. There are 16 potential variations that can be captured using the amended classification.

## Definition/guide

### What is an autopsy?

Autopsy definition includes:

- internal autopsy
- external autopsy
- detailed pathology and/or histology testing or
- verbal autopsy

### What is an adequate SUDI investigation?

An investigation definition includes:

- Death scene examination, and / or
- Medical history and review.

### Intrinsic or ‘non-modifiable’ factors

Mitchell and Krous note that the ‘*epidemiology of SIDS has been well described and has been largely consistent over time and place,*’ with non-modifiable or intrinsic risk factors including certain social and personal characteristics, and:<sup>197</sup>

- Low birth weight (less than 2500g)
- Preterm birth (less than 37 weeks’ gestation)
- Small for gestational age (less than 10th percentile weight for age at birth) or small for age on relevant intergrowth 21 or WHO charts respectively

<http://www.who.int/childgrowth/standards/en/>

<https://intergrowth21.tghn.org/articles/intergrowth-21st-newborn-size-birth-chart>

<https://intergrowth21.tghn.org/articles/intergrowth-21st-postnatal-growth-standards-and-z-scores-preterm-infants/>

- Maternal smoking during pregnancy
- Preceding infectious illness.

### Extrinsic or ‘modifiable’ factors

While recognising that a sleep environment is the primary environment for an infant, the framework does not limit SUDI to circumstances where an infant is specifically placed for sleep.

The classification would apply in circumstances where, for example, an adult fell asleep while holding or feeding an infant, or where an infant was placed in a stroller or rocker for any purpose.

There are well evidenced modifiable or extrinsic risk factors for SUDI:

**Prone sleeping:**<sup>198</sup> Placing an infant to sleep in a prone (on their front) position is a significant risk factor for SUDI. The prone position increases the risk of re-breathing expired gases,<sup>199</sup> overheating,<sup>200</sup> and accidental suffocation – particularly for very young infants with limited head control and/or infants placed on soft bedding.<sup>201</sup> Placing an infant to sleep on their side is also not recommended as it may promote the infant rolling into a prone position.<sup>202</sup>

**Bed-sharing:**<sup>203</sup> Sleeping in the same bed as a baby can be unsafe if the infant gets caught under adult bedding or pillows, becomes wedged in gaps between the mattress and wall, or is rolled on

197. Mitchell E, Krous H 2015. Sudden unexpected death in infancy: a historical perspective. *Journal of Paediatrics and Child Health*, 51, 108-12.

198. Ibid.

199. Resulting in unusually high levels of carbon dioxide in the blood and inadequate oxygen supply.

200. By decreasing the rate of heat loss and increasing body temperature compared with infants sleeping supine (on their backs).

201. Moon RY 2011. Task force on Sudden Infant Death Syndrome. SIDS and other sleep related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), e1341-67.

202. Task Force on Sudden Infant Death Syndrome 2005. The changing concept of Sudden Infant Death Syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*, 116(5), 1245-55.

203. Mitchell E, Krous H 2015. Sudden unexpected death in infancy: a historical perspective. *Journal of Paediatrics and Child Health*, 51, 108-12.

or covered by an adult who sleeps very deeply, is affected by drugs or alcohol, and/or is extremely tired. Infants under 12 weeks have an increased risk of SUDI even if the parents do not smoke or drink alcohol and the infant is breast-fed.<sup>204</sup> Bed-sharing can be intentional or unintentional – for example, if a carer falls asleep while holding or feeding an infant.

**Bedding that is not designed for infants and/or for sleeping, eg a sofa:**<sup>205</sup> Placing a baby for sleep or leaving a baby to sleep on a surface not specifically designed for infants to sleep increases the risk of SUDI. Examples of inappropriate surfaces include sofas, chairs, adult bedding, car seats, strollers and slings.<sup>206</sup> Risks to infants placed to sleep on these surfaces include suffocation, entrapment, strangulation and assuming positions that can cause airway obstruction.<sup>207</sup> Infant bedding that does not meet safety standards (eg mattresses too small, broken cot railings) also poses risk.

**Exposure to smoking:**<sup>208</sup> Exposure to tobacco smoke has been shown to adversely affect infant arousal and to increase the risk of premature birth and low birth weight, both of which are risk factors for SIDS. Tobacco smoke exposure is also linked to decreased lung growth and increased rates of respiratory tract infections, otitis media (ear infection) and childhood asthma – with the severity of these problems increasing with increased exposure.<sup>209, 210</sup> Research indicates that bed sharing with an infant greatly increases the risk for SIDS if either or both of the parents smoke. Strategies to minimise a baby’s exposure to tobacco smoke – such as keeping windows open, avoiding smoking near the baby, or smoking outside – are not completely effective in reducing an infant’s exposure to tobacco smoke.<sup>211, 212, 213</sup>

**Excess bedding and clothing:**<sup>214</sup> The risk of dying suddenly and unexpectedly is increased if an infant is placed prone, and that risk is even further increased if the infant is placed prone under heavy bedding or if their head becomes covered by bedding in any position.<sup>215</sup> Excessive clothing and/or bedding can contribute to the risk of thermal stress by providing insulation which prevents infants from regulating their temperature.<sup>216</sup> This can occur when a baby’s head or face becomes covered by bedding or clothing, or when an infant is wrapped or dressed in overly warm clothing and is unable to cool down by evaporation of sweat.<sup>217</sup>

**Soft pillows or other objects in sleep environment:**<sup>218</sup> Loose soft items in an infant’s sleep environment pose a potential risk of suffocation or overheating. Pillows, quilts, sheepskins and other soft surfaces have been noted to increase the risk of SIDS five-fold, independent of sleep position.<sup>219</sup>

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204. Carpenter R, McGarvey C, Mitchell EA et al 2013. Bed sharing when parents do not smoke: is there a risk of SIDS? An individual level analysis of five major case– control studies. *BMJ Open*, 3, e002299.
205. Moon RY 2011. Task force on Sudden Infant Death Syndrome. SIDS and other sleep related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), e1341-67.
206. SIDS and Kids do not promote or support specific products. Infant ‘snuggle beds’ do not meet the SIDS and Kids guidelines for a safe sleeping surface.
207. Red Nose Australia 2021. SIDS and Kids Information Sheet: Safe sleeping. Accessed from [https://rednose.org.au/downloads/RedNose-SafeSleep-HealthProfEducators\\_Mar21.pdf](https://rednose.org.au/downloads/RedNose-SafeSleep-HealthProfEducators_Mar21.pdf) on 1 March 2021.
208. Zhang K, Wang X 2013. Maternal smoking and increased risk of sudden infant death syndrome: a meta-analysis. *Legal Medicine*, 15 (3), 115-21.
209. DiFranza JR, Aligne CA, Weitzman M 2004. Prenatal and postnatal environmental tobacco smoke exposure and children’s health. *Pediatrics*, 113 (Supplement 3): 1007-15.
210. Red Nose Australia 2021. SIDS and Kids Information Sheet: Smoking. Accessed from [https://rednose.org.au/downloads/Smoking-Safe\\_Sleeping-Information\\_Statement\\_Nov\\_2017\\_WEB.pdf](https://rednose.org.au/downloads/Smoking-Safe_Sleeping-Information_Statement_Nov_2017_WEB.pdf) on 1 March 2021.
211. Red Nose Australia 2021. SIDS and Kids Information Sheet: Smoking. Accessed from [https://rednose.org.au/downloads/Smoking-Safe\\_Sleeping-Information\\_Statement\\_Nov\\_2017\\_WEB.pdf](https://rednose.org.au/downloads/Smoking-Safe_Sleeping-Information_Statement_Nov_2017_WEB.pdf) on 1 March 2021.
212. Moon RY, Fu L 2012. Sudden Infant Death Syndrome: An update. *Pediatrics in Review*, 33, 314-20.
213. Groner JA, Hoshaw-Woodard S, Koren G et al 2005. Screening for children’s exposure to environmental tobacco smoke in a pediatric primary care setting. *Archives of Pediatric and Adolescent Medicine*, 159(5), 450-5.
214. Mitchell E, Krous H 2015. Sudden unexpected death in infancy: a historical perspective. *Journal of Paediatrics and Child Health*, 51, 108-12.
215. Red Nose Australia 2021. SIDS and Kids Information Sheet: Bedding amount recommended for safe sleep. Accessed from [https://rednose.org.au/downloads/Bedding\\_Amount-Safe\\_Sleeping-Information\\_Statement\\_Nov\\_2017\\_WEB.pdf](https://rednose.org.au/downloads/Bedding_Amount-Safe_Sleeping-Information_Statement_Nov_2017_WEB.pdf) on 1 March 2021.
216. British Columbia Coroners Service Child Death Review Unit 2009. Safe and sound: a five-year retrospective report on sudden infant death in sleep-related circumstances. BC Coroners Service, Ottawa.
217. Red Nose Australia 2021. SIDS and Kids Information Sheet: room temperature. Accessed from <https://rednose.org.au/article/room-temperature-on-1-March-2021>.
218. Hauck FR, Herman SM, Donovan M et al 2003. Sleep environment and the risk of sudden infant death syndrome in an urban population: the Chicago Infant Mortality Study. *Pediatrics*, 111(5), 1207-14.
219. Moon RY 2011. Task force on Sudden Infant Death Syndrome. SIDS and other sleep related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics*, 128(5), e1341-67.



**Table 10. NSW Child Death Review Team revised SUDI classifications**

Classification	Post-death investigation	Factors
SUDI 3A	Post-death investigation is sufficient, with autopsy and investigation	No intrinsic or extrinsic factors present
SUDI 3B	Post-death investigation is sufficient, with autopsy and investigation	Intrinsic factors present
SUDI 3C	Post-death investigation is sufficient, with autopsy and investigation	Extrinsic factors present
SUDI 3D	Post-death investigation is sufficient, with autopsy and investigation	Both intrinsic and extrinsic factors present
SUDI 3E	Post-death investigation is sufficient, with autopsy and investigation	Unknown what factors present
SUDI 2A	Post-death investigation only, no autopsy	No intrinsic or extrinsic factors present
SUDI 2B	Post-death investigation only, no autopsy	Intrinsic factors present
SUDI 2C	Post-death investigation only, no autopsy	Extrinsic factors present
SUDI 2D	Post-death investigation only, no autopsy	Both intrinsic and extrinsic factors present
SUDI 2E	Post-death investigation only, no autopsy	Unknown what factors present
SUDI 1A	Post-death investigation limited to autopsy only	No intrinsic or extrinsic factors present
SUDI 1B	Post-death investigation limited to autopsy only	Intrinsic factors present
SUDI 1C	Post-death investigation limited to autopsy only	Extrinsic factors present
SUDI 1D	Post-death investigation limited to autopsy only	Both intrinsic and extrinsic factors present
SUDI 1E	Post-death investigation limited to autopsy only	Unknown what factors present
SUDI 0E	It is not possible to determine if an autopsy and investigation occurred, or that there was no autopsy and investigation	Unknown what factors present

**Table 11. NSW Child Death Review Team SUDI classification Quick Guide**

Autopsy and Investigation		Factors present	
0_	Unknown if any investigation OR no investigation	_A	No intrinsic or extrinsic factors present
1_	autopsy only	_B	Intrinsic factors present
2_	investigation only	_C	Extrinsic factors present
3_	autopsy and investigation	_D	Both intrinsic and extrinsic factors present
		_E	Unknown what factors present

## Appendix 5: Leading causes of death

Table 12. Top 5 leading causes of death by age group, five-year trends, NSW 2005-2019

Age group	2005-2009		2010-2014		2015-2019		2005-2019	
	Rank	Cause of death % (N)	Rank	Cause of death % (N)	Rank	Cause of death % (N)	Rank	Cause of death % (N)
<b>Total &lt;1 population</b>		<b>N=1942</b>		<b>N=1709</b>		<b>N=1471</b>		<b>N=5122</b>
Under 1 year	1	Perinatal 55.6 (1079)	1	Perinatal 52.1 (891)	1	Perinatal 53.6 (788)	1	Perinatal 53.8 (2758)
	2	Congenital 21.5 (418)	2	Congenital 24.9 (426)	2	Congenital 25.3 (373)	2	Congenital 23.8 (1217)
	3	Nervous system 2.2 (42)	3	Nervous system 2.3 (40)	3	Nervous system 2.5 (37)	3	Nervous system 2.3 (119)
	4	Endocrine 1.2 (24)	4	Accidental threats to breathing 1.5 (25)	4	Accidental threats to breathing 1.8 (27)	4	Accidental threats to breathing 1.3 (69)
	5	Accidental threats to breathing 0.9 (17)	5	Endocrine 1.4 (24)	5	Respiratory 1.5 (22)	5	Endocrine or Respiratory 1.3 (66)
<b>Total 1-4 population</b>		<b>N=359</b>		<b>N=313</b>		<b>N=288</b>		<b>N=960</b>
1-4 years	1	Drowning 13.9 (50)	1	Cancers and tumours 19.2 (60)	1	Cancers and tumours 18.1 (52)	1	Cancers and tumours 16.0 (154)
	2	Cancers and tumours 11.7 (42)	2	Congenital 11.5 (36)	2	Drowning or congenital or transport 9.7 (28)	2	Drowning 11.8 (113)
	3	Transport 10.3 (37)	3	Drowning 11.2 (35)	3	Nervous system 8.7 (25)	3	Congenital 9.5 (91)
	4	Nervous system 8.1 (29)	4	Respiratory system 8.3 (26)	4	Respiratory system 8.3 (24)	4	Transport 8.9 (85)
	5	Congenital 7.5 (27)	5	Nervous system 8.0 (25)	5	Endocrine 5.6 (16)	5	Nervous system 8.2 (79)

	2005-2009		2010-2014		2015-2019		2005-2019	
Age group	Rank	Cause of death % (N)	Rank	Cause of death % (N)	Rank	Cause of death % (N)	Rank	Cause of death % (N)
<b>Total 5-9 population</b>		<b>N=213</b>		<b>N=200</b>		<b>N=196</b>		<b>N=609</b>
5-9 years	1	Cancers and tumours 23.5 (50)	1	Cancers and tumours 27.0 (54)	1	Cancers and tumours 31.1 (61)	1	Cancers and tumours 27.1 (165)
	2	Transport 13.1 (28)	2	Transport 15.0 (30)	2	Transport 12.2 (24)	2	Transport 13.5 (82)
	3	Nervous system 9.4 (20)	3	Nervous system 10.0 (20)	3	Endocrine 9.1 (18)	3	Nervous system 9.4 (57)
	4	Congenital 7.0 (15)	4	Congenital 8.0 (16)	4	Nervous system 8.7 (17)	4	Congenital 7.6 (46)
	5	Circulatory system or drowning 6.6 (14)	5	Drowning 6.0 (12)	5	Congenital 7.7 (15)	5	Circulatory system 5.3 (32)
<b>Total 10-14 population</b>		<b>N=220</b>		<b>N=196</b>		<b>N=220</b>		<b>N=636</b>
10-14 years	1	Transport 20.0 (44)	1	Cancers and tumours 23.0 (45)	1	Cancers and tumours 20.9 (46)	1	Cancers and tumours 19.7 (125)
	2	Cancers and tumours 15.5 (34)	2	Nervous system 13.8 (27)	2	Transport 9.9 (31)	2	Transport 15.1 (96)
	3	Nervous system 14.5 (32)	3	Transport 10.7 (21)	3	Suicide 12.3 (27)	3	Nervous system 12.3 (78)
	4	Circulatory system 8.6 (19)	4	Congenital 9.7 (19)	4	Nervous system 8.6 (19)	4	Suicide 8.5 (54)
	5	Congenital 8.2 (18)	5	Suicide 7.7 (15)	5	Respiratory system 7.3 (16)	5	Congenital 7.9 (50)
<b>Total 15-17 population</b>		<b>N=334</b>		<b>N=329</b>		<b>N=312</b>		<b>N=975</b>
15-17 years	1	Transport 34.4 (115)	1	Transport 24.0 (79)	1	Suicide 34.0 (106)	1	Transport 27.1 (264)
	2	Suicide 19.5 (65)	2	Suicide 22.5 (74)	2	Transport 22.4 (70)	2	Suicide 25.1 (245)
	3	Cancers and tumours 12.9 (43)	3	Cancers and tumours 12.2 (40)	3	Cancers and tumours 14.4 (45)	3	Cancers and tumours 13.1 (128)
	4	Nervous system 6.0 (20)	4	Nervous system 7.3 (24)	4	Nervous system 5.4 (17)	4	Nervous system 6.3 (61)
	5	Circulatory system 5.4 (18)	5	Endocrine 4.6 (15)	5	Circulatory system 3.8 (12)	5	Circulatory system 4.5 (44)

Table 13. Top 5 leading causes of death by gender, five-year trends, NSW 2005-2019

	2005-2009		2010-2014		2015-2019		2005-2019	
	Rank	Cause of death % (N)	Rank	Cause of death % (N)	Rank	Cause of death % (N)	Rank	Cause of death % (N)
<b>Total female population</b>		<b>N=1264</b>		<b>N=1173</b>		<b>N=1069</b>		<b>N=3506</b>
Females 0-17 years	1	Perinatal 35.7 (451)	1	Perinatal 31.7 (372)	1	Perinatal 33.7 (360)	1	Perinatal 33.7 (1183)
	2	Congenital 17.9 (226)	2	Congenital 20.4 (239)	2	Congenital 17.9 (191)	2	Congenital 18.7 (656)
	3	Cancers and tumours 6.6 (84)	3	Cancers and tumours 9.4 (110)	3	Cancers and tumours 9.6 (103)	3	Cancers and tumours 8.5 (297)
	4	Transport 5.9 (75)	4	Nervous system 5.1 (60)	4	Nervous system 4.9 (52)	4	Transport 5.3 (185)
	5	Nervous system 5.5 (69)	5	Transport 5.0 (59)	5	Transport 4.8 (51)	5	Nervous system 5.2 (181)
<b>Total male population</b>		<b>N=1804</b>		<b>N=1574</b>		<b>N=1417</b>		<b>N=4795</b>
Males 0-17 years	1	Perinatal 35.3 (636)	1	Perinatal 33.5 (528)	1	Perinatal 30.3 (430)	1	Perinatal 33.2 (1594)
	2	Congenital 14.5 (262)	2	Congenital 17.1 (269)	2	Congenital 17.5 (248)	2	Congenital 16.2 (779)
	3	Transport 8.7 (157)	3	Cancers and tumours 6.3 (99)	3	Cancers and tumours 8.2 (116)	3	Transport 7.4 (357)
	4	Cancers and tumours 5.4 (98)	4	Transport 6.1 (96)	4	Transport 7.3 (104)	4	Cancers and tumours 6.5 (313)
	5	Nervous system 4.1 (74)	5	Nervous system 4.8 (76)	5	Suicide 6.6 (93)	5	Nervous system 4.4 (213)

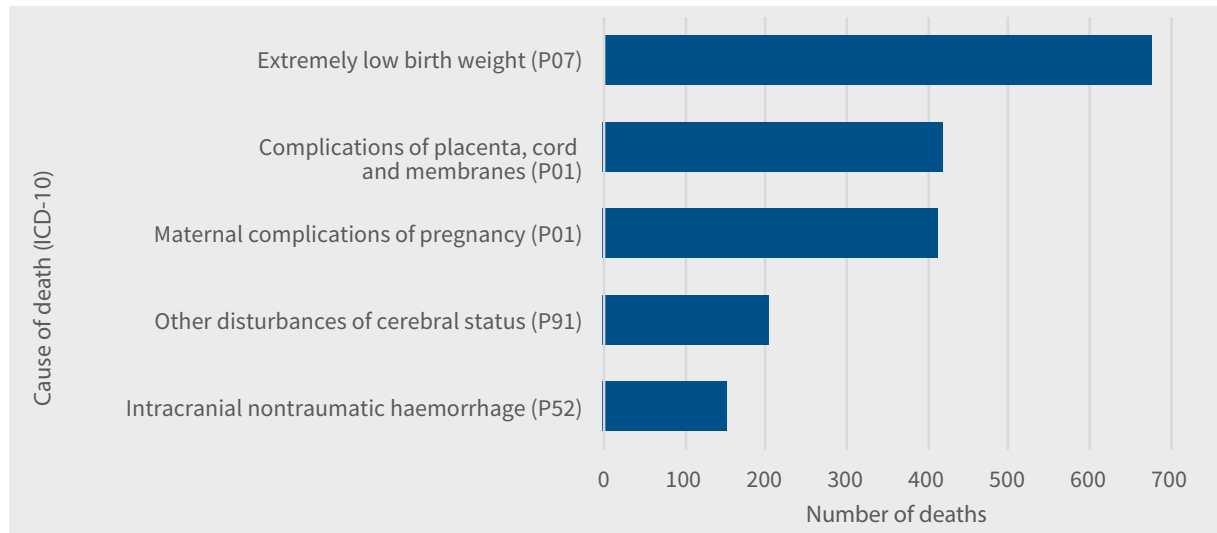
**Table 14. Top 5 leading causes of death by Aboriginal and Torres Strait Islander status, five-year trends, NSW 2005-2019**

	2005-2009		2010-2014		2015-2019		2005-2019	
	Rank	Cause of death % (N)	Rank	Cause of death % (N)	Rank	Cause of death % (N)	Rank	Cause of death % (N)
<b>Total Aboriginal population</b>		<b>N=256</b>		<b>N=280</b>		<b>N=261</b>		<b>N=797</b>
Aboriginal and Torres Strait Islander 0-17 years	1	Perinatal 32.8 (84)	1	Perinatal 36.1 (101)	1	Perinatal 26.4 (69)	1	Perinatal 31.9 (254)
	2	Congenital 12.9 (33)	2	Congenital 12.1 (34)	2	Congenital 13.8 (36)	2	Congenital 12.9 (103)
	3	Transport 10.2 (26)	3	Transport 8.2 (23)	3	Transport or suicide 7.3 (19)	3	Transport 8.5 (68)
	4	Drowning 3.5 (9)	4	Suicide or nervous system 3.9 (11)5.4 (15)	4	Cancers and tumours 6.1 (16)	4	Suicide 4.3 (34)
	5	Cancers and tumours 3.1 (8)	5	Respiratory system or drowning 3.2 (9)	5	Respiratory system 4.6 (12)	5	Cancers and tumours 3.8 (30)
<b>Total non-Indigenous population</b>		<b>N=2793</b>		<b>N=2464</b>		<b>N=2211</b>		<b>N=7468</b>
Non-Indigenous 0-17 years	1	Perinatal 35.7 (998)	1	Perinatal 32.3 (797)	1	Perinatal 32.6 (720)	1	Perinatal 33.7 (2515)
	2	Congenital 16.1 (451)	2	Congenital 19.2 (474)	2	Congenital 18.2 (403)	2	Congenital 17.8 (1328)
	3	Transport 7.3 (205)	3	Cancers and tumours 8.2 (203)	3	Cancers and tumours 9.2 (203)	3	Cancers and tumours 7.8 (579)
	4	Cancers and tumours 6.2 (173)	4	Transport 5.4 (132)	4	Transport 6.2 (136)	4	Transport 6.3 (473)
	5	Nervous system 4.9 (137)	5	Nervous system 5.1 (125)	5	Suicide 5.1 (113)	5	Nervous system 4.9 (367)

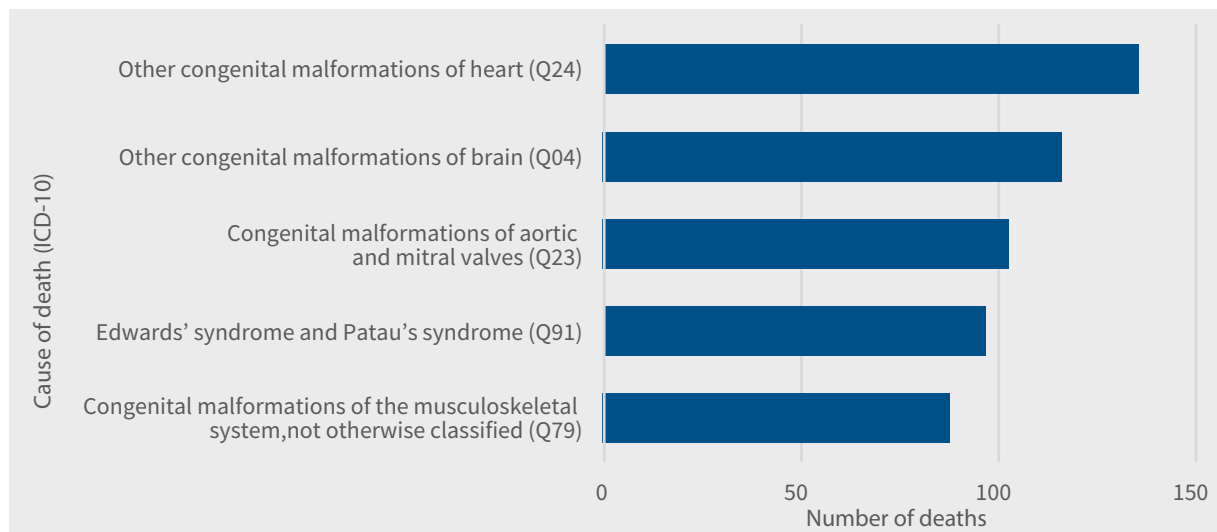
**Table 15. Top 5 leading natural causes of death due to perinatal conditions, infants <1 year, five-year trends, NSW 2005-2019**

ICD code	2005-2009 % (N=1079)	2010-2014 % (N=891)	2015-2019 % (N=788)	2005-2019 % (N=2758)
Intracranial nontraumatic haemorrhage (P52)	7.0 (76)	4.8 (43)	4.1 (32)	5.5 (151)
Other disturbances of cerebral status (P91)	8.5 (92)	7.0 (62)	6.0 (47)	7.4 (203)
Maternal complications of pregnancy (P01)	7.7 (83)	16.4 (146)	23.4 (184)	15.0 (413)
Complications of placenta, cord and membranes (P02)	10.3 (111)	18.4 (164)	18.3 (144)	15.2 (419)
Extremely low birth weight (P07)	29.1 (314)	24.5 (218)	18.1 (143)	24.5 (675)

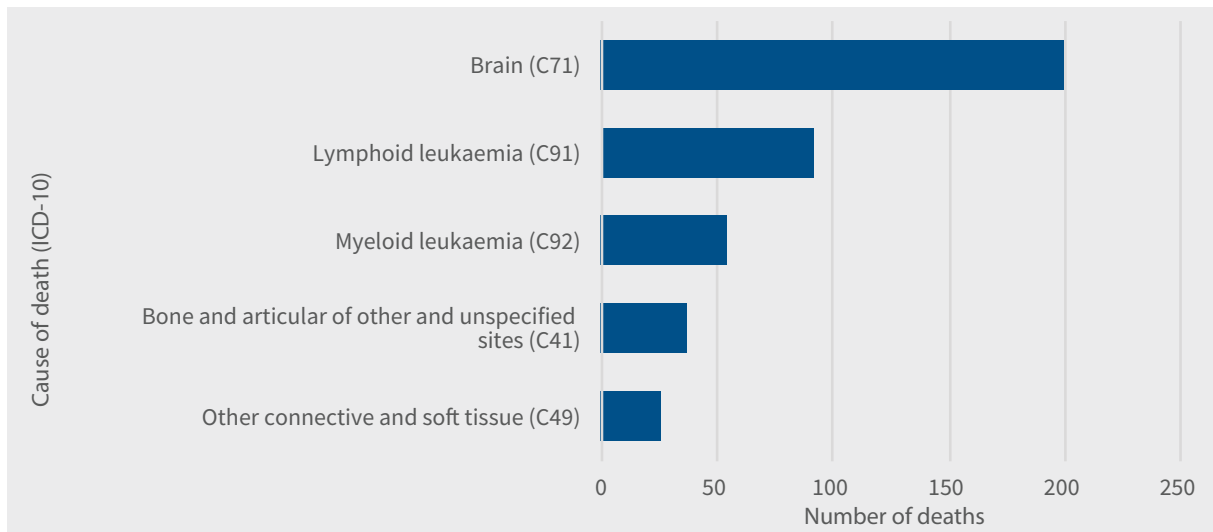
**Figure 57. Top five leading natural causes of death from perinatal conditions for infants aged <1 year, NSW 2005-2019**



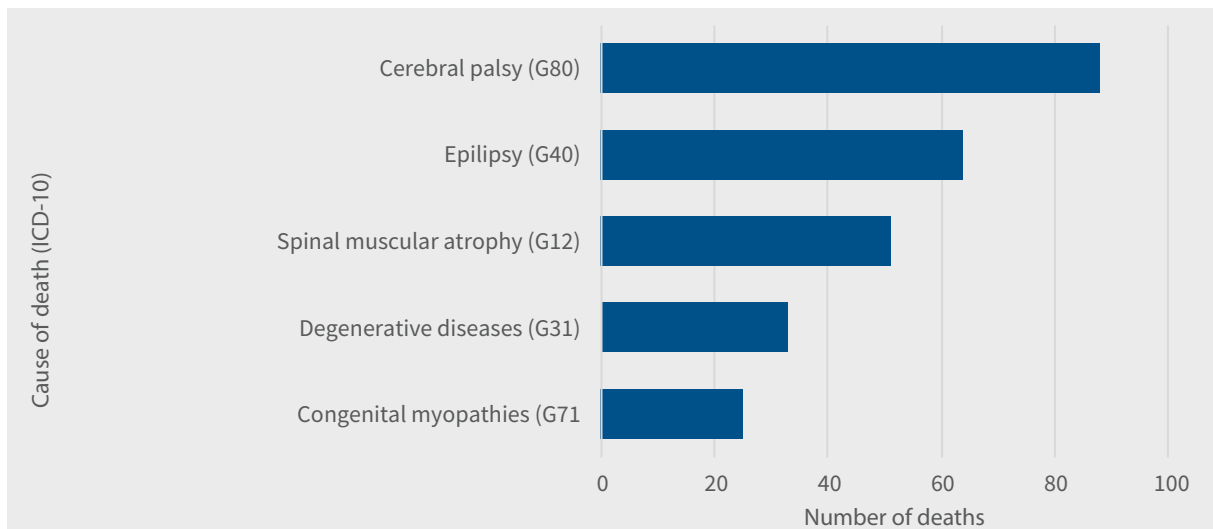
**Figure 58. Top five leading natural causes of death from congenital and chromosomal conditions for children aged 0-17 years, NSW 2005-2019**



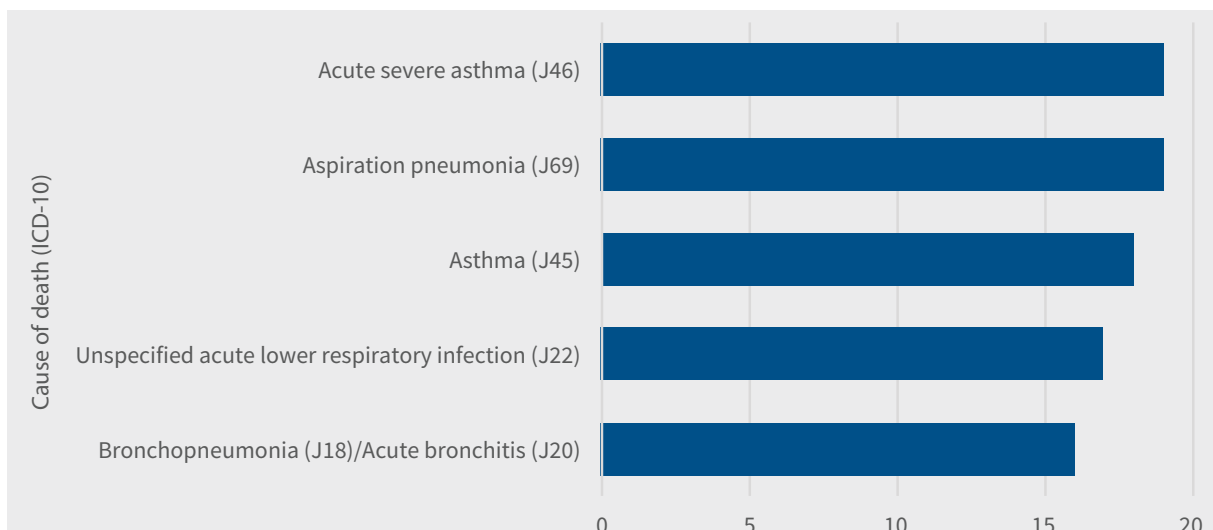
**Figure 59. Top five leading natural causes of death from cancers and tumours for children aged 0-17 years, NSW 2005-2019**



**Figure 60. Top five leading natural causes of death from nervous system diseases for children aged 0-17 years, NSW 2005-2019**

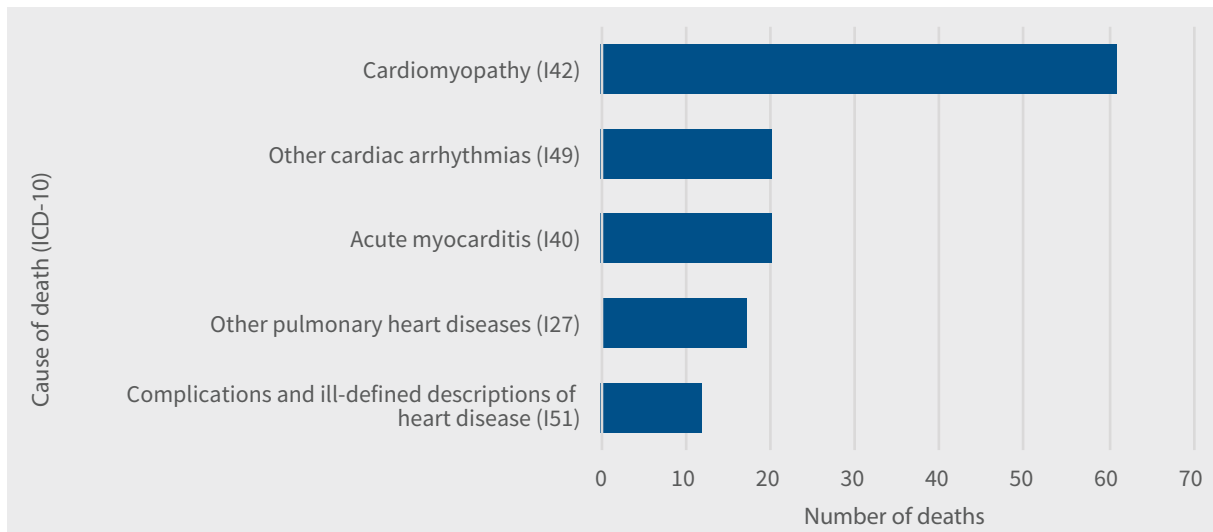


**Figure 61. Top five leading natural causes of death from respiratory system diseases for children aged 0-17 years, NSW 2005-2019**

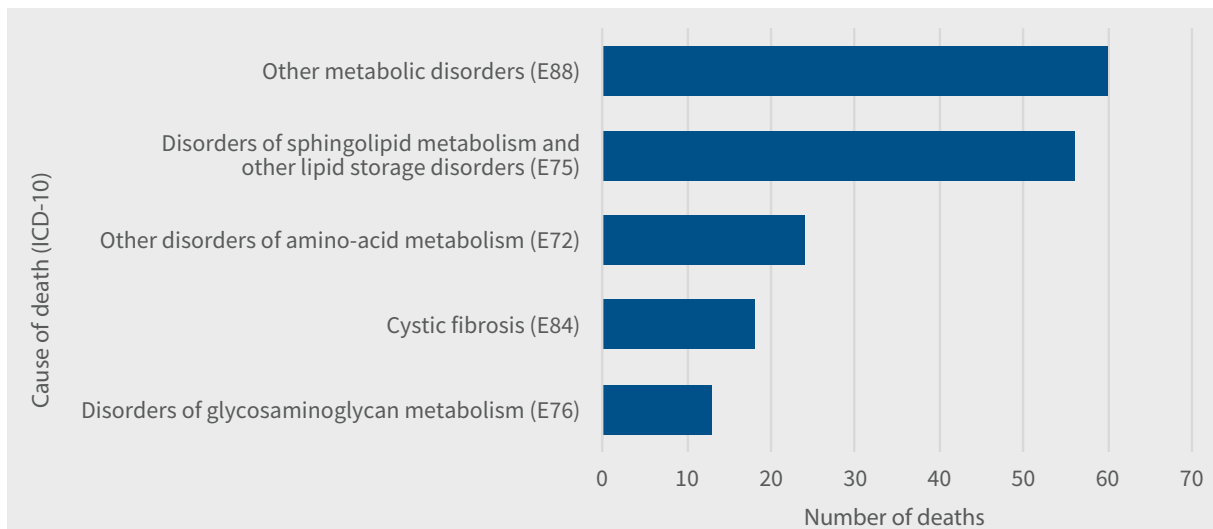




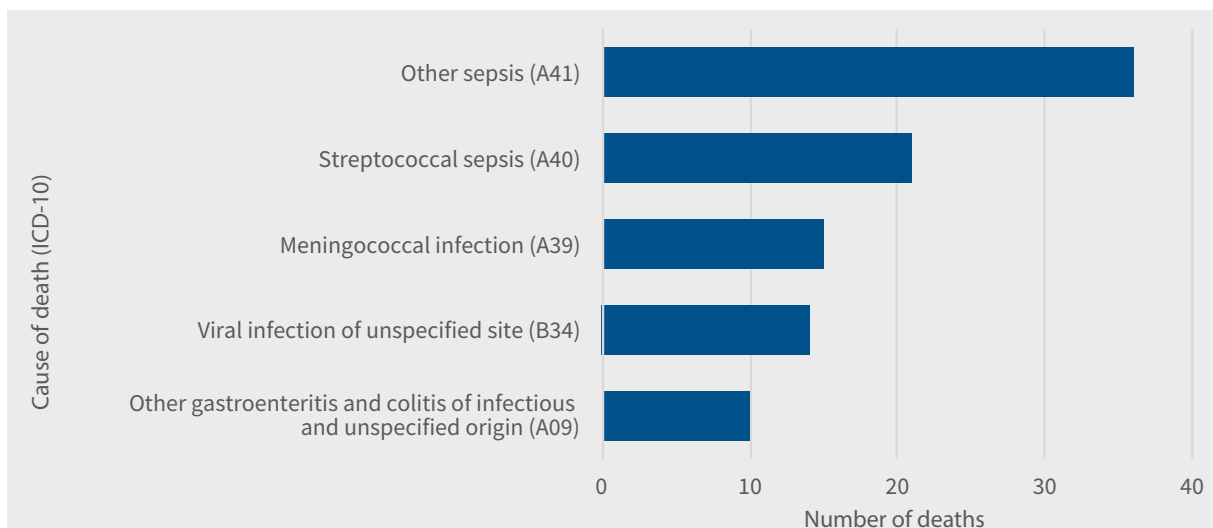
**Figure 62. Top five leading natural causes of death from circulatory diseases for children aged 0-17 years, NSW 2005-2019**



**Figure 63. Top five leading natural causes of death from endocrine, nutritional and metabolic diseases for children aged 0-17 years, NSW 2005-2019**



**Figure 64. Top five leading natural causes of death from infectious diseases for children aged 0-17 years, NSW 2005-2019**



## Appendix 6: Supplementary data

Table 16. Deaths of infants and children aged 0-17 years by age group, NSW 2005-2019

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Children aged 0-17 years	Population	1588682	1591812	1602269	1612212	1623266	1635207	1641477	1655562	1670581	1686666	1705486	1727228	1747144	1758783	1773114
	Deaths	659	624	605	606	574	596	578	509	558	506	505	465	528	472	517
	Crude MR <sup>^</sup>	41.48	39.20	37.76	37.59	35.36	36.45	35.21	30.74	33.40	30.00	29.61	26.92	30.22	26.84	29.16
	95% CI <sup>*</sup>	38.31 - 44.65	36.12 - 42.28	34.75 - 40.77	34.60 - 40.58	32.47 - 38.25	33.52 - 39.37	32.34 - 38.08	28.07 - 33.42	30.63 - 36.17	27.39 - 32.61	27.03 - 32.19	24.47 - 29.37	27.64 - 32.80	24.42 - 29.26	26.64 - 31.67
	Directly Standardised MR <sup>^</sup>	43.34	39.96	37.31	36.97	34.59	35.70	35.21	30.29	32.87	30.24	29.77	26.84	30.89	27.78	30.05
	95% CI	40.03 - 46.65	36.82 - 43.09	34.33 - 40.28	34.02 - 39.91	31.76 - 37.42	32.83 - 38.56	32.34 - 38.08	27.66 - 32.93	30.14 - 35.60	27.61 - 32.88	27.18 - 32.37	24.40 - 29.28	28.26 - 33.53	25.28 - 30.29	27.46 - 32.64
Children aged 1-17 years	Population	1502202	1502311	1507619	1516570	1526109	1537436	1546659	1557385	1571354	1590268	1607374	1625624	1648949	1661548	1674076
	Deaths	232	235	227	216	216	225	219	199	204	191	210	204	212	200	190
	Crude MR	15.44	15.64	15.06	14.24	14.15	14.63	14.16	12.78	12.98	12.01	13.06	12.55	12.86	12.04	11.35
	95% CI	13.46 - 17.43	13.64 - 17.64	13.10 - 17.02	12.34 - 16.14	12.27 - 16.04	12.72 - 16.55	12.28 - 16.03	11.00 - 14.55	11.20 - 14.76	10.31 - 13.71	11.30 - 14.83	10.83 - 14.27	11.13 - 14.59	10.37 - 13.71	9.74 - 12.96
	Directly Standardised MR <sup>^</sup>	15.72	15.76	15.11	14.24	14.12	14.62	14.16	12.79	13.01	12.06	13.17	12.73	13.06	12.34	11.65
	95% CI	13.70 - 17.75	13.75 - 17.78	13.14 - 17.08	12.34 - 16.13	12.23 - 16.00	12.71 - 16.53	12.28 - 16.03	11.02 - 14.57	11.23 - 14.80	10.35 - 13.77	11.39 - 14.95	10.99 - 14.48	11.30 - 14.81	10.63 - 14.05	9.99 - 13.30
Infants aged <1 year	Births	91224	92188	96351	100276	98231	101266	99054	98508	100462	91074	100079	96083	96591	107343	98906
	Deaths	427	389	378	390	358	371	359	310	354	315	295	261	316	272	327
	Infant mortality rate	4.68	4.22	3.92	3.89	3.64	3.66	3.62	3.15	3.52	3.46	2.95	2.72	3.27	2.53	3.31
	95% CI	4.24 - 5.12	3.80 - 4.64	3.53 - 4.32	3.50 - 4.28	3.27 - 4.02	3.29 - 4.04	3.25 - 4.00	2.80 - 3.50	3.16 - 3.89	3.08 - 3.84	2.61 - 3.28	2.39 - 3.05	2.91 - 3.63	2.23 - 2.84	2.95 - 3.66

<sup>^</sup>MR=Mortality rate per 100,000 population; IMR=Infant mortality rate per 1,000 live births; <sup>\*</sup>CI=Confidence interval

**Table 17. Deaths of children aged 0-17 years by gender, NSW 2005-2019**

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Males</b>	Population	814880	816277	822163	827582	833860	840132	843998	851290	858723	866960	876479	887623	897620	903785	910758
	Deaths	379	382	343	369	331	369	324	304	309	268	284	268	299	271	295
	Crude MR <sup>^</sup>	46.51	46.80	41.72	44.59	39.69	43.92	38.39	35.71	35.98	30.91	32.40	30.19	33.31	29.99	32.39
	95% CI <sup>*</sup>	41.83 - 51.19	42.10 - 51.49	37.30 - 46.13	40.04 - 49.14	35.42 - 43.97	39.44 - 48.40	34.21 - 42.57	31.70 - 39.72	31.97 - 40.00	27.21 - 34.61	28.63 - 36.17	26.58 - 33.81	29.53 - 37.09	26.41 - 33.56	28.69 - 36.09
	Directly Standardised MR <sup>^</sup>	46.32	45.88	39.52	42.35	37.43	41.39	36.96	33.84	33.98	29.97	31.51	29.08	33.04	29.98	32.23
	95% CI	41.65 - 50.98	41.28 - 50.49	35.34 - 43.71	38.03 - 46.67	33.40 - 41.46	37.17 - 45.62	32.94 - 40.99	30.03 - 37.64	30.19 - 37.77	26.38 - 33.56	27.84 - 35.17	25.60 - 32.56	29.30 - 36.79	26.41 - 33.55	28.56 - 35.91
<b>Females</b>	Population	773802	775535	780106	784630	789406	795075	797479	804272	811858	819706	829007	839605	849524	854998	862356
	Deaths	280	242	262	237	243	227	254	205	249	238	221	197	229	201	221
	Crude MR <sup>^</sup>	36.18	31.20	33.59	30.21	30.78	28.55	31.85	25.49	30.67	29.03	26.66	23.46	26.96	23.51	25.63
	95% CI	31.95 - 40.42	27.27 - 35.14	29.52 - 37.65	26.36 - 34.05	26.91 - 34.65	24.84 - 32.26	27.93 - 35.77	22.00 - 28.98	26.86 - 34.48	25.35 - 32.72	23.14 - 30.17	20.19 - 26.74	23.46 - 30.45	20.26 - 26.76	22.25 - 29.01
	Directly Standardised MR <sup>^</sup>	36.04	30.25	31.60	28.07	28.59	26.55	30.26	24.04	28.75	27.87	25.61	22.15	26.12	23.18	24.99
	95% CI	31.82 - 40.26	26.43 - 34.06	27.78 - 35.43	24.49 - 31.64	24.99 - 32.18	23.09 - 30.00	26.54 - 33.98	20.75 - 27.33	25.18 - 32.33	24.33 - 31.41	22.24 - 28.99	19.06 - 25.24	22.74 - 29.50	19.98 - 26.38	21.69 - 28.28

<sup>^</sup>MR=Mortality rate per 100,000 population; <sup>\*</sup>CI=Confidence interval

**Table 18. Deaths of children aged 0-17 years by Aboriginal and Torres Strait Islander status, NSW 2005-2019**

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Aboriginal and Torres Strait Islander</b>	Population	84380	92505	95133	97336	99246	101054	102751	104346	105705	106979	108239	109513	110263	111300	112211
	Deaths	51	64	56	53	32	60	57	47	68	48	45	54	46	56	60
	Crude MR <sup>^</sup>	60.44	69.19	58.86	54.45	32.24	59.37	55.47	45.04	64.33	44.87	41.57	49.31	41.72	50.31	53.47
	95% CI <sup>*</sup>	45.00 - 79.47	53.28 - 88.35	44.47 - 76.44	40.79 - 71.22	22.05 - 45.52	45.31 - 76.43	42.02 - 71.87	33.10 - 59.90	49.95 - 81.55	33.08 - 59.49	30.32 - 55.63	37.04 - 64.34	30.54 - 55.65	38.01 - 65.34	40.80 - 68.83
	Directly Standardised MR <sup>^</sup>	60.63	67.04	55.55	52.86	31.98	59.30	55.47	45.02	64.49	46.51	42.04	49.28	42.63	50.47	53.28
	95% CI	45.00 - 79.47	53.28 - 88.35	44.47 - 76.44	40.79 - 71.22	22.05 - 45.52	45.31 - 76.43	42.02 - 71.87	33.10 - 59.90	49.95 - 81.55	33.08 - 59.49	30.32 - 55.63	37.04 - 64.34	30.54 - 55.65	38.01 - 65.34	40.80 - 68.83
<b>Non-Indigenous</b>	Population	1504302	1499307	1507136	1514876	1524020	1534153	1538726	1551216	1564876	1579687	1597247	1617715	1636881	1647483	1660903
	Deaths	606	557	548	548	534	535	521	461	489	458	457	409	479	413	453
	Crude MR <sup>^</sup>	40.28	37.15	36.36	36.17	35.04	34.87	33.86	29.72	31.25	28.99	28.61	25.28	29.26	25.07	27.27
	95% CI	37.08 - 43.49	34.07 - 40.24	33.32 - 39.40	33.15 - 39.20	32.07 - 38.01	31.92 - 37.83	30.95 - 36.77	27.01 - 32.43	28.48 - 34.02	26.34 - 31.65	25.99 - 31.23	22.83 - 27.73	26.64 - 31.88	22.65 - 27.49	24.76 - 29.79
	Directly Standardised MR <sup>^</sup>	42.16	37.99	36.00	35.59	34.24	34.12	33.86	29.26	30.72	29.18	28.77	25.19	29.91	26.00	28.17
	95% CI	38.81 - 45.52	34.83 - 41.14	32.98 - 39.01	32.61 - 38.57	31.34 - 37.15	31.23 - 37.01	30.95 - 36.77	26.59 - 31.93	27.99 - 33.44	26.51 - 31.86	26.13 - 31.41	22.75 - 27.63	27.23 - 32.59	23.49 - 28.51	25.58 - 30.77

<sup>^</sup>MR=Mortality rate per 100,000 population; <sup>\*</sup>CI=Confidence interval

**Table 19. Deaths of children aged 1-17 years by age group, NSW 2005-2019**

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1-4 years	Population	341744	342033	348186	358623	368809	376470	378587	383416	389321	395641	397001	399527	404131	401898	399937
	Deaths	79	70	73	71	66	68	67	51	71	56	56	77	52	58	45
	Crude MR <sup>^</sup>	23.12	20.47	20.97	19.80	17.90	18.06	17.70	13.30	18.24	14.15	14.11	19.27	12.87	14.43	11.25
5-9 years	Population	437467	436668	435344	436096	437887	441071	447973	455693	465436	476943	489154	498455	504469	508280	511360
	Deaths	47	44	36	50	36	35	38	45	40	42	50	29	43	37	37
	Crude MR <sup>^</sup>	10.74	10.08	8.27	11.47	8.22	7.94	8.48	9.88	8.59	8.81	10.22	5.82	8.52	7.28	7.24
10-14 years	Population	453635	450788	448605	446767	445894	445481	445949	444310	445192	446471	448682	453745	466351	477946	489423
	Deaths	40	52	49	35	44	43	42	36	37	38	34	39	52	48	47
	Crude MR <sup>^</sup>	8.82	11.54	10.92	7.83	9.87	9.65	9.42	8.10	8.31	8.51	7.58	8.60	11.15	10.04	9.60
15-17 years	Population	269356	272822	275484	275084	273519	274414	274150	273966	271405	271213	272537	273897	273998	273424	273356
	Deaths	66	69	69	60	70	79	72	67	56	55	70	59	65	57	61
	Crude MR <sup>^</sup>	24.50	25.29	25.05	21.81	25.59	28.79	26.26	24.46	20.63	20.28	25.68	21.54	23.72	20.85	22.32

<sup>^</sup>MR=Mortality rate per 100,000 population

**Table 20. Deaths of children aged 0-17 years by cause of death, NSW 2005-2019**

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Natural causes	Deaths	490	445	430	472	428	455	438	378	430	385	380	344	406	349	369
	Crude MR <sup>^</sup>	30.84	27.96	26.84	29.28	26.37	27.83	26.68	22.83	25.74	22.83	22.28	19.92	23.24	19.84	20.81
Injury (all)	Deaths	116	125	114	93	103	102	97	90	82	80	97	104	89	83	77
	Crude MR <sup>^</sup>	7.30	7.85	7.11	5.77	6.35	6.24	5.91	5.44	4.91	4.74	5.69	6.02	5.09	4.72	4.34
Transport	Deaths	46	66	45	31	44	35	33	37	27	23	34	32	35	31	22
	Crude MR <sup>^</sup>	2.90	4.15	2.81	1.92	2.71	2.14	2.01	2.23	1.62	1.36	1.99	1.85	2.00	1.76	1.24
Drowning	Deaths	10	16	22	19	13	14	17	13	14	9	9	15	9	5	7
	Crude MR <sup>^</sup>	0.63	1.01	1.37	1.18	0.80	0.86	1.04	0.79	0.84	0.53	0.53	0.87	0.52	0.28	0.39
Suicide*	Deaths	18	11	16	13	19	14	17	19	18	21	27	27	28	23	28
	Crude MR <sup>^</sup>	2.49	1.52	2.21	1.80	2.64	1.94	2.36	2.65	2.51	2.93	3.74	3.71	3.78	3.06	3.67

\*Suicide deaths and rates are based on children aged 10-17 years.

<sup>^</sup>MR=Mortality rate per 100,000 population





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