# 8 Sudden unexpected deaths in infancy (SUDI)

**Twenty-nine infant deaths were classified as SUDI in 2024–25. Sudden infant death syndrome (SIDS) and undetermined causes, as a group, are the leading cause of death in infants aged 1 to 11 months and remain a key focus of our child death prevention efforts.**

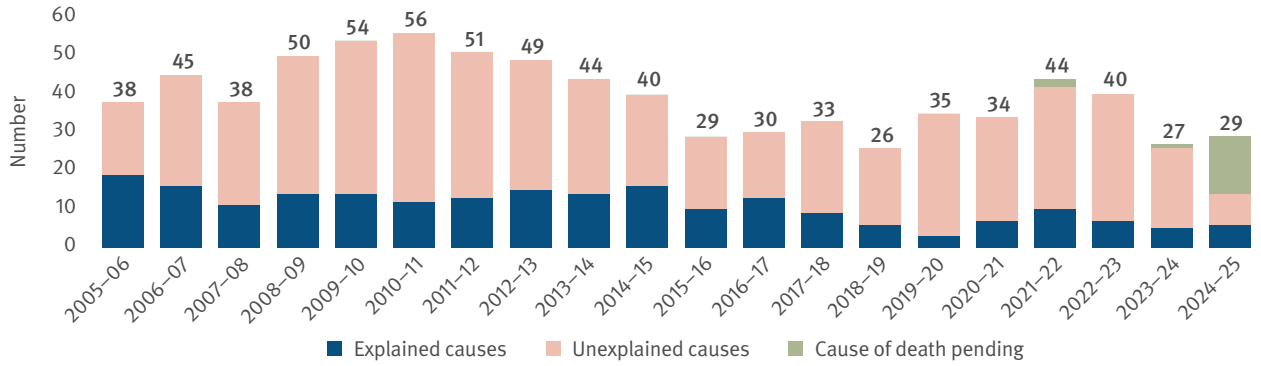
We continue to apply an evidence-based classification system to group cases of SUDI according to the likelihood of suffocation so we can better monitor the role of unsafe sleep environments and sleep-related accidents. We also continue to identify gaps in investigation and inform risk minimisation strategies as part of our normal operations. Through these ongoing efforts, we aim to reduce preventable infant deaths and support safer sleep practices across communities.

The Commission works in partnership with the Queensland Paediatric Quality Council (QPQC) on SUDI research and prevention. Data from the Register has been used to inform the following research, public education and policy/program developments:

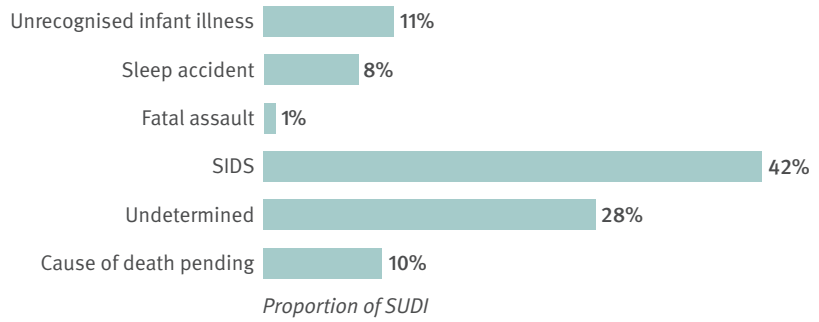
- Infant Mortality Subcommittee, QPQC, *Sudden and unexpected infant deaths during sleep in Queensland 2013–2016: Risk factors and opportunities for prevention* paper, released in April 2025.
- Institute for Urban Indigenous Health culturally responsive service planning.
- QPQC to support early intervention and regional planning.
- River's Gift to guide the development of an infant safe sleep education program in childcare centres across regional Queensland.
- First 2000 Days, Reform Office, Queensland Health to monitor SUDI trends for the Pepi-Pod® program as part of the Putting Queensland Kids First initiative addressing Queensland's higher SUDI rates.
- Coroners Court of Queensland to help investigate concerns around co-sleeping and unsafe infant sleeping practices, with analysis across Hospital and Health Service regions.

# Key facts on sudden unexpected deaths in infancy

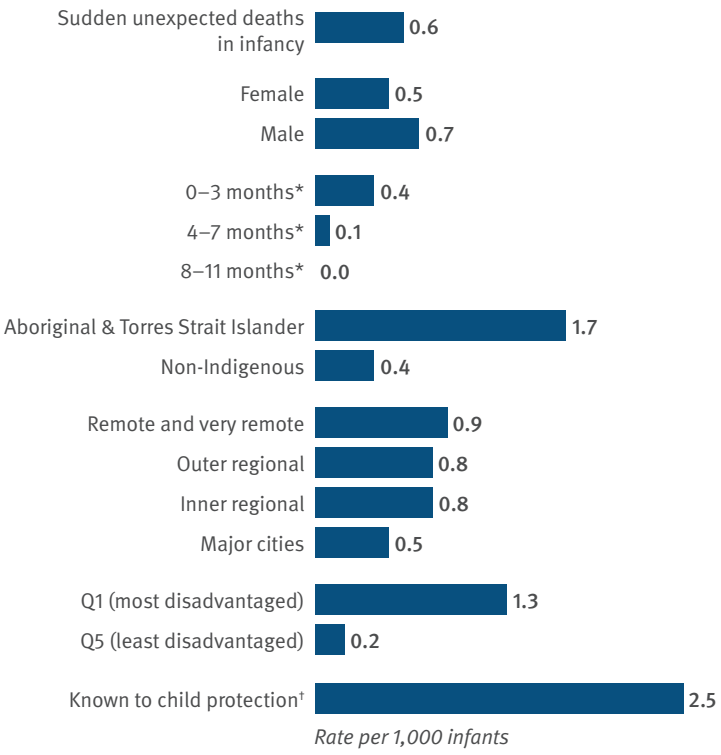
## 2005 to 2025




## 5-year summary (2020–2025) | Cause of death category




## Demographics




## Key points

### SUDI

Infants who die suddenly,
usually during sleep,
with no immediately obvious cause

### 35 SUDI per year

on average in last 5 years

### SIDS and undetermined causes

Cause remains unexplained
after investigation

Leading cause of death
for infants 1–11 months

### Unsafe sleep factors

present for many SUDI

*Notes: Counting is by date of death registration. Percentages may not add to 100 due to rounding.*
** rate per 1,000 births.*
*† in the 12 months prior to death.*

## Key findings

Sudden unexpected death in infancy (SUDI) is a research classification which groups together the deaths of apparently well infants who would be expected to thrive, yet, for reasons often unknown, die suddenly and unexpectedly. It does not correspond with any single medical definition or categorisation. Identifying deaths in this way assists in the identification of possible risk factors for, and associations with, sudden infant death and, most significantly, those factors which may be preventable or amenable to change.

SUDI is defined as the death of an infant aged less than 12 months, that is sudden and unexpected and where the cause was not immediately apparent at the time of death.

During 2024–25, there were 29 SUDI deaths in Queensland, with no significant change from the previous reporting period (27 deaths). Of the 29 SUDI, 15 were pending a cause at the time of reporting—this reflects the longer timeframes for SUDI deaths due to the complexity of the post-mortems and coronial investigation.

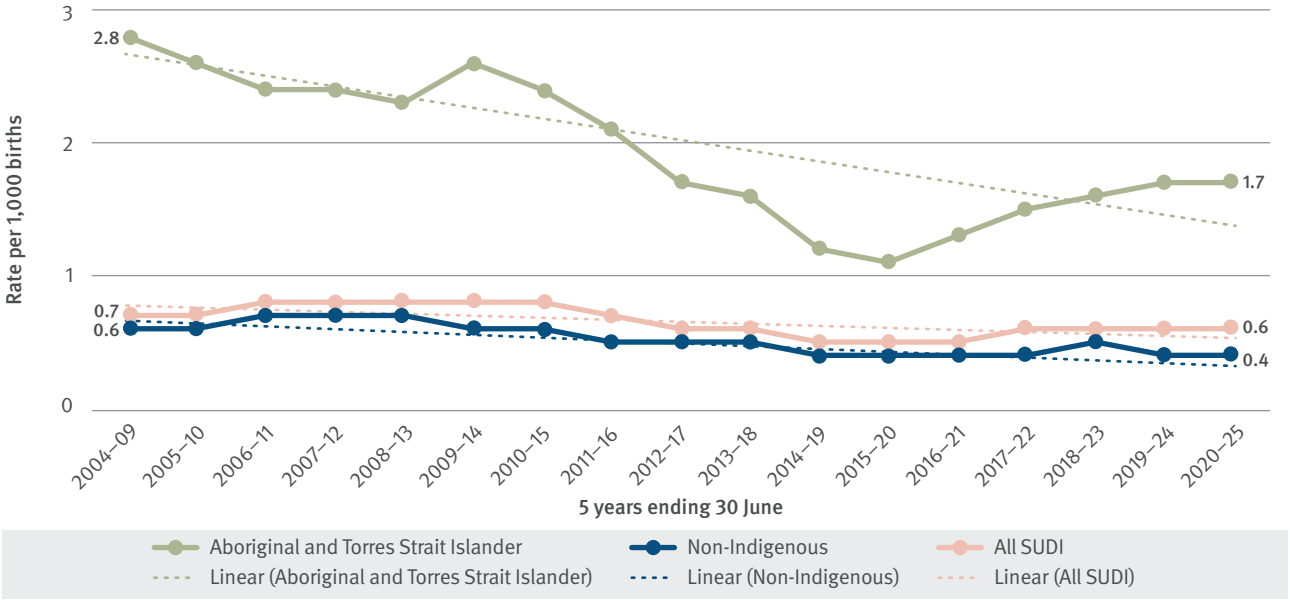
The SUDI mortality rate was 0.6 per 1,000 live births (5-year average).

Table A.11 in Appendix A provides summary data on SUDI in the last 5 years. Explained SUDIs are also included in the chapter relating to the specific causes of death.

### Aboriginal and Torres Strait Islander infants

Figure 8.1 shows the trends in the 5-year rolling rates of Aboriginal and Torres Strait Islander SUDI, non-Indigenous SUDI and all SUDI in Queensland. The SUDI rate for Aboriginal and Torres Strait Islander infants was around 4 times the non-Indigenous SUDI rate between 2004–09 and 2011–16. Rates of Aboriginal and Torres Strait Islander SUDI dropped considerably between 2014 and 2020, reducing to 2.5 times the non-Indigenous rate in 2015–20.[86] In more recent periods the rates of Aboriginal and Torres Strait Islander SUDI have been increasing, with Aboriginal and Torres Strait Islander SUDI rates 4 times the non-Indigenous SUDI rate in 2020–25.

**Figure 8.1:** SUDI by Aboriginal and Torres Strait Islander status (5-year rolling rate), 2004–09 to 2020–25




86 Tables with data for 2004–2025 are available online at www.qfcc.qld.gov.au/sector/child-death/child-death-reports-and-data

## Cause of death category

Cases of SUDI with an official cause of death are grouped into the following categories and sub-categories. Deaths with an explained cause will also be counted within the relevant chapter, namely Chapter 2 for illnesses, Chapter 5 for sleep accidents, and Chapter 7 for non-accidental injury.

**Explained SUDI**—infant deaths for which a cause was not immediately obvious; but for which post-mortem examinations were able to identify a specific reason:

- Infant illness or condition unrecognised at the time of death
- Sleep accidents (threats to breathing)
- Non-accidental injury (fatal assault).

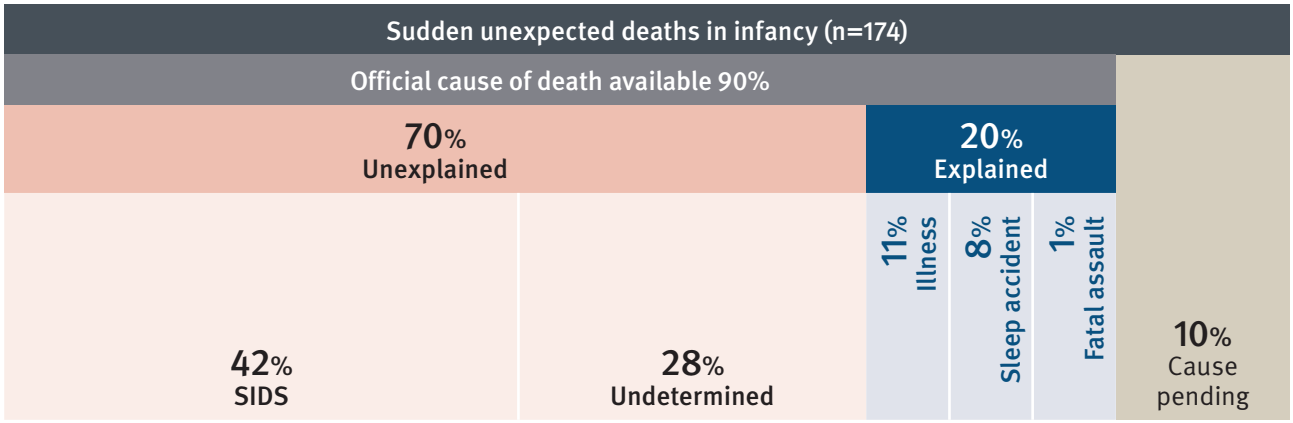
**Unexplained SUDI**—those infant deaths for which a cause could not be determined:

- Sudden infant death syndrome (SIDS)[87]
- Undetermined causes.[88]

It should be noted that postmortem examinations of SUDI cannot distinguish between undetermined causes and suffocation on the basis of the physiological findings.[89] This is known to contribute to an under classification of suffocation in official cause of death records.[90] Nonetheless, in many of the infant deaths considered sudden and unexpected, one or more aspects of the sleep environment were not consistent with a safe sleep environment.[91]

There were 174 SUDI in the last 5 years and, as indicated in Figure 8.2, 70% were found to be unexplained SUDI (SIDS and undetermined causes) while 20% were explained SUDI (illness, sleep accident and fatal assault). A further 10% were pending a cause at the time of reporting.

**Figure 8.2:** SUDI by cause of death (proportion), 2020–21 to 2024–25




*Notes: Percentages may not add to subtotals and totals due to rounding.*

87 Krous HF, Beckwith JB, Byard RW, Rognum TO, Bajanowski T, Corey T, Cutz E, Hanzlick R, Keens TG, and Mitchell EA (2004) 'Sudden infant death syndrome and unclassified sudden infant deaths: a definitional and diagnostic approach', *Pediatrics*, 114:234–8, doi:10.1542/peds.114.1.234

88 A finding where: natural disease processes are detected and are not considered sufficient to cause death but preclude a diagnosis of SIDS; there are signs of significant stress; non-accidental, but non-lethal, injuries are present; toxicology testing detects non-prescribed but non-lethal drugs; or a full autopsy has not been performed and a cause is not otherwise identified.

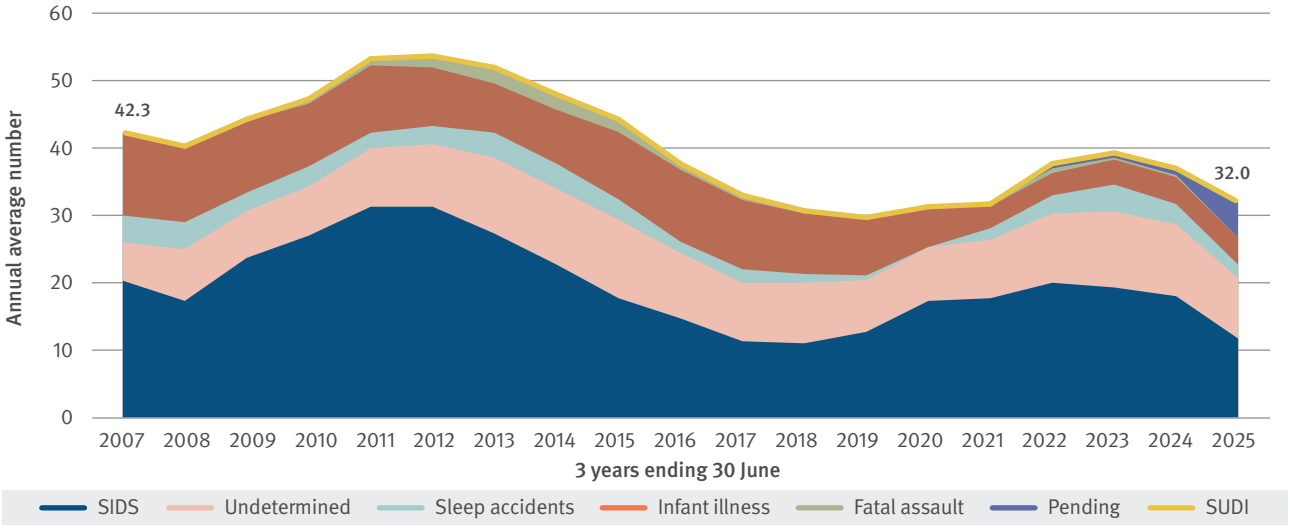
89 Byard RW and Jensen L (2007) 'Fatal asphyxia episodes in the very young – Classification and diagnostic issues.' *Forensic Science Medicine and Pathology* 3, 177-181; Byard RW (2018) 'The autopsy and pathology of Sudden Infant Death Syndrome' in Duncan, JR & Byard, RW (eds.) *SIDS, sudden infant and early childhood death: the past, the present and the future*, 497-538. Adelaide: University of Adelaide Press.

90 Shapiro-Mendoza CK, Camperlengo L, Ludvigsen R, Cottengim C, Anderson RN, Andrew T, Covington T, Hauck FR, Kemp J, and MacDorman M (2014) 'Classification system for the Sudden Unexpected Infant Death Case Registry and its application', *Pediatrics*, 134(1), e210–e219, doi.org/10.1542/peds.2014-0180; Shipstone RA et al (2020) 'An evaluation of pathologists' application of the diagnostic criteria from the San Diego definition of SIDS and unclassified sudden infant death', *International Journal of Legal Medicine*, 134(3), 1015–1021, doi.org/10.1007/s00414-019-02126-w

91 Factors in safe and unsafe sleep environments are described in the *Best practice guide for the design of safe infant sleeping environments*, available at www.productsafety.gov.au/about-us/publications/best-practice-guide-for-the-design-of-safe-infant-sleeping-environments

Fluctuations in the number and causes of SUDI are shown in Figure 8.3 as 3-year rolling averages. While the number of SUDI has decreased since 2011, average annual numbers increased again since 2019 before decreasing again after 2023.[92] Deaths from infant illness, undetermined causes and sleep accidents remained comparatively stable across the entire period; in contrast, SIDS deaths rose and fell. However, some caution is warranted as assigning definitive causes for SUDI remains complex and developments in cause of death classification are ongoing.[93]

**Figure 8.3:** SUDI by cause of death (3-year rolling average number), 2004–07 to 2022–25



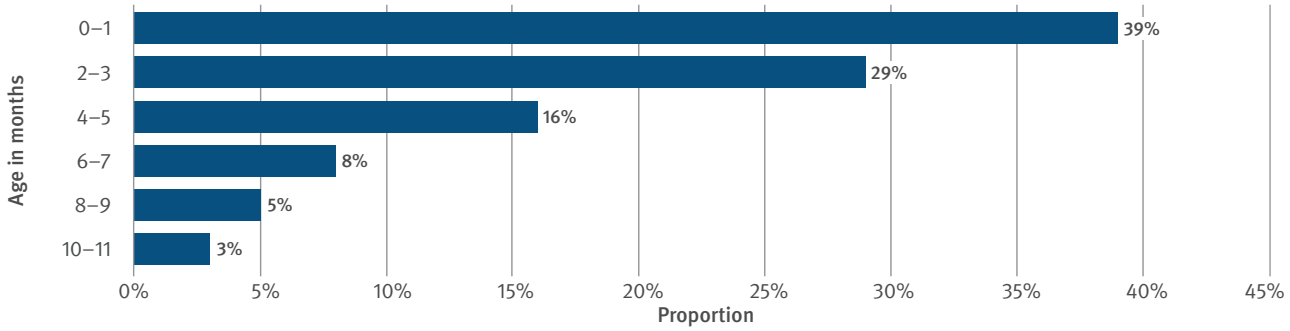

SUDI later found to be the result of fatal assault or neglect are excluded from the analyses presented throughout the remainder of this chapter.

## Sex and age

A slightly larger proportion of SUDI in the last 5 years were males (60% male compared with 40% female). The male SUDI rate was 0.7 per 1,000 male births compared to the female SUDI rate of 0.5 per 1,000 female births.

Figure 8.4 shows SUDI by age at death in the last 5 years. Approximately two-thirds of sudden unexpected deaths (68%) occurred among infants aged 0–3 months.

**Figure 8.4:** SUDI by age in months (proportion), 2020–21 to 2024–25




*Notes: Excludes SUDI from fatal assault and neglect. Percentages may not add to 100 due to rounding.*

92 An expanded table on SUDI from 2004 to 2025 is available on the report web page.

93 An expert panel review of Queensland post-neonatal SUDI deaths from 2013 recoded around half of the deaths to a different cause, with shifts occurring from explained to unexplained causes and vice versa. McEniery J, Cruice D (2018), **'The voice of the infant: Cause of death coding does not always reflect what really mattered in the life of the infant who died suddenly and unexpectedly'** [poster presentation], *Perinatal Society of Australia and New Zealand Conference*, Auckland, **www.childrens.health.qld.gov.au/chq/health-professionals/qpqc/**

## Risk factors for SUDI

A number of factors have been associated with an increased risk of SUDI.[94] These can be classified according to whether they are associated with the infant, the family or the sleep environment.

**Infant factors:** Prematurity and low birth weight, multiple gestation (twins, triplets), neonatal health problems, male sex, and recent history of minor viral respiratory infections and/or gastrointestinal illness.

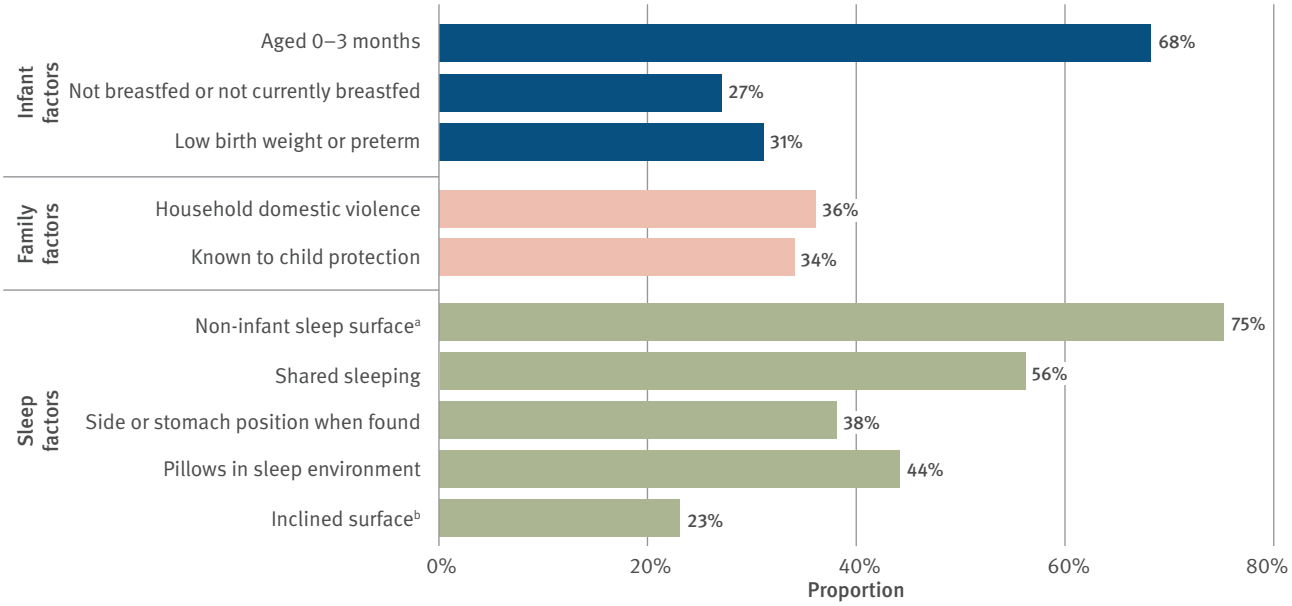
**Family factors:** Cigarette smoking during pregnancy and after birth, young maternal age (≤ 20 years), single marital status, high parity (number of births by mother) and short intervals between pregnancies, poor or delayed prenatal care, abuse or family violence, high-risk lifestyles including alcohol and illicit drug abuse, and social disadvantage and poverty.

**Sleep environment factors:** Sleeping on soft surfaces and loose bedding, prone (stomach) and side sleeping position, some forms of shared sleeping, and overwrapping or overheating.

Selected characteristics of the infant, family and unsafe sleep factors in SUDI deaths over the last 5 years are shown in Figure 8.5.[95] These indicate increased risk in the first months and for infants born with low birth weight.

Using non-infant sleep surfaces (75% of SUDI), sharing a sleep surface (56%) and sleep position on side or stomach (38%) are all reported to increase the risk of sudden unexpected infant deaths, as are pillows (44%) and excess bedding in the sleep space.

**Figure 8.5: SUDI by selected infant, family and sleep factors (proportion), 2020–21 to 2024–25**




*a Includes adult sleep surfaces and other surfaces such as a couch/chair or infant product not primarily for sleep (e.g. pram/stroller, baby capsule).*

*b Includes infants propped on pillows or other items, and products with an inclined surface: pram/stroller; infant swing/rocker; baby capsule/car seat.*

*Notes: Excludes SUDI from fatal assault and neglect.*

94 The Triple Risk Model proposes SUDI risk increases with combined factors of vulnerable infant; critical development period; and external stressors https://rednose.org.au/article/why-are-safe-sleeping-recommendations-so-important

95 Analysis based on the 174 SUDI deaths in the last 5 years, excluding one death found to be from fatal assault and neglect.

## Clinical guidelines: Safer infant sleep

The Queensland Health ***Safer infant sleep clinical guideline***, released in late 2022, highlights infant care practices that are associated with promoting airway protection for infants, which in turn reduces the risk of SUDI.[96]

Co-designed with key stakeholders including parent consumers, the guideline contains a clearly articulated risk minimisation approach to safer infant sleep. A risk minimisation approach ensures that caregivers receive information that includes benefits and risks, together with strategies to increase safety, in a range of diverse infant sleep environments, including shared sleeping. Evidence demonstrates risk minimisation approaches better equip families with the practical information they need to meet the needs of their infant within their family circumstances and the resources they have available.

Understanding infant vulnerabilities and removing as many factors as possible in the infant's environment which place them at increased risk for SUDI is a key message of the guideline. The new guideline also highlights the importance of communication between clinicians and families regarding implementation of these messages by families. Listening to and respecting family choices should shape how the information is shared so that families trust these messages and understand the relevance to their infant care decisions.[97]

Improving caregiver understanding of how infants breathe and the importance of protecting airways when sleeping helps families to understand why the safer sleep messages are relevant to their infant. It also creates the opportunity to assess risks in the infant sleep environment, consider infant vulnerabilities and make safer sleep plans which consider the family's unique circumstances.

The guideline also describes the importance of having conversations about safer infant sleep repeatedly over multiple time points and involving a wide range of potential carers (e.g. fathers, grandparents etc.).

Applying this simple message:

***Easier to breathe – Safer to sleep***, every time an infant sleeps is critical

96 Queensland Health (2022) *Queensland Clinical Guidelines, Safer infant sleeping*. Guideline No. MN22.71-V1-R27, www.health.qld.gov.au/__data/assets/pdf_file/0025/1166353/g-safer-sleep.pdf

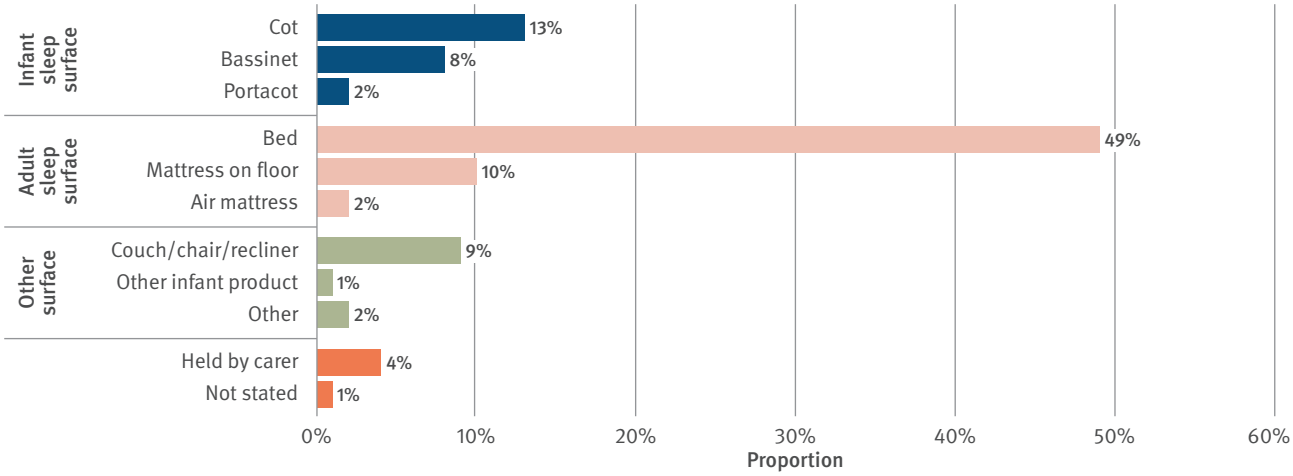
97 Pease A, Garstang JJ, Ellis C, Watson D, Ingram J, Cabral C, Blair PS, and Fleming PJ (2021) 'Decision-making for the infant sleep environment among families with children considered to be at risk of sudden unexpected death in infancy: a systematic review and qualitative metasynthesis', *BMJ Paediatrics Open*, https://bmjpaedsopen.bmj.com/content/5/1/e000983

# Sleep environment factors

## Sleep surface

As indicated in Figure 8.6, in over half the SUDI (61%) in the last 5 years the infant was on an adult sleep surface at the time of the incident and a further 9% were on a couch or recliner. Only 23% of SUDI occurred when an infant sleep product was being used.[98]

**Figure 8.6:** SUDI by sleep surface (proportion), 2020–21 to 2024–25




*Notes: Excludes SUDI from fatal assault and neglect. Percentages may not add to 100 due to rounding.*

# Infant sleep position

Safer infant sleep advice is to place infants on their backs to sleep (supine). Once infants can roll of their own accord it remains important that the sleep surface is firm and flat—the infant's face/nose may be obstructed if the surface is too soft.

Information from incident reports on infant sleep position is shown in Table 8.1. While 74 (43%) deceased infants in the last 5 years were placed and found on their back, a further 28 (16%) had moved from their back to stomach or side position when found. Of the 173 infants dying suddenly and unexpectedly, 65 were on their stomach or side when found (38% of SUDI excluding those from non-accidental injury).

**Table 8.1:** Infant sleep position when placed and found (number), 2020–21 to 2024–25

| Position when placed | Position when found | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Back | Stomach | Side | Other | Held by carer | Unknown | |
| Back (supine) | 74 | 21 | 7 | 1 | 0 | 4 | 107 |
| Stomach (prone) | 2 | 13 | 0 | 0 | 0 | 1 | 16 |
| Side | 2 | 7 | 8 | 0 | 0 | 1 | 18 |
| Other | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| Held by carer | 0 | 4 | 0 | 2 | 8 | 1 | 15 |
| Unknown | 5 | 4 | 0 | 2 | 0 | 4 | 15 |
| Total | 83 | 50 | 15 | 6 | 8 | 11 | 173 |

*Notes: Excludes SUDI from fatal assault and neglect.*

98 Percentages by surface types in Figure 8.6 may not add to subtotals presented in this paragraph due to rounding.

## Inclined surface

A firm, flat sleeping surface (not tilted or elevated) is recommended to reduce the risk of SUDI, including for babies with reflux.[99] Information in the Child Death Register indicates 23% of SUDI in the last 5 years were placed on an inclined surface. Most of these involved propping infants on pillows or other items. Some incidents involved an infant product with an inclined surface, including a hammock and infant car seat.

## Shared sleeping

Over half (97, 56%) of the infants whose deaths were sudden and unexpected were sharing a sleep surface with one or more people at the time of death. Not all shared sleeping was planned—in some incidents, the carer fell asleep while nursing the infant.

Sharing a sleep surface with a baby can increase the risk of SIDS and fatal sleep accidents in some circumstances.[100] Some studies have found there is an increased risk of SIDS only when mothers who smoke share a bed with their infant, although such findings are insufficient to enable complete reassurance that bed sharing is safe for non-smokers.

Risks are also associated with shared sleeping if infants are sharing a sleep surface with a caregiver who is under the influence of alcohol or drugs which cause sedation, if the caregiver is excessively tired or there are multiple people in the bed with the infant.

Of the 97 SUDI in a shared sleep environment over the last 5 years, the following additional risk factors were identified:

- tobacco (44%)
- position in sleep environment, such as placed between 2 people or on top of a co-sleeping person (31%)
- alcohol or substance use (27%)
- extreme fatigue (20%)
- obesity (6%).

## Unexplained deaths of children aged 1–17 years

While this chapter primarily examines sudden unexpected deaths of infants, a smaller proportion of unexplained-cause deaths were of children aged 1 year and over (see **Table A.10**, **Appendix A**). Over the last 5 years, while 85% of unexplained deaths were infants, 8% were aged 1–4 years and 8% were aged 5–17 years.

Some deaths in the younger age group show similarities to SUDI deaths in that they occurred during sleep with SUDI risk factors present. In some unexplained deaths, investigations have found the cause of death to be injury; however, it cannot be determined whether the cause of the injury was accidental or intentional.

99 Queensland Health (2022) *Queensland Clinical Guidelines. Safer infant sleep*, Guideline No. MN22.71V1-R27, www.health.qld.gov.au/__data/assets/pdf_file/0025/1166353/g-safer-sleep.pdf

100 Queensland Health (2022) *Queensland Clinical Guidelines. Safer infant sleep*, Guideline No. MN22.71V1-R27, www.health.qld.gov.au/__data/assets/pdf_file/0025/1166353/g-safer-sleep.pdf

## A systemic evaluation and comparison of the consistency of infant safer sleep messaging in Australia

This systematic review, published in Frontiers in Communication (2025), evaluates the consistency of publicly available infant safer sleep guidance documents in Australia, with a focus on messaging around shared sleep practices—a key factor in sudden unexpected death in infancy (SUDI) prevention.[101] The review analysed 32 documents from 26 organisations, including government bodies, professional associations, and educational groups, benchmarking them against the International Society for the Study and Prevention of Perinatal and Infant Death (ISPID) guidelines.

While all documents aligned with ISPID's core recommendations, only one—Queensland Health's Clinical Guidelines—included all 13 consensus recommendations. Most documents supported foundational safer sleep practices such as supine sleep positioning, avoiding soft bedding, and maintaining smoke-free environments. However, messaging around non-consensus topics like dummy use, swaddling, and in-bed sleep devices was inconsistent.

A major focus of the review was how organisations addressed shared sleep (bed-sharing/co-sleeping). Despite its prevalence—up to 76% of Australian families engage in shared sleep during the first 3 months—fewer than half of the documents acknowledged cultural or familial motivations for the practice. Only 35% recognised its bi-directional relationship with breastfeeding, despite evidence that shared sleep can support breastfeeding and maternal rest.

Documents were assessed using a seven-criteria framework to determine whether they adopted a Risk Elimination or Risk Minimisation approach. Risk Elimination messaging discourages shared sleep entirely, often using prescriptive or alarmist language. Risk Minimisation messaging, by contrast, provides balanced information, acknowledges real-world behaviours, and offers practical strategies for safer shared sleep. Queensland Health, the Australian College of Midwives, and the Australian Breastfeeding Association scored highest for Risk Minimisation alignment, while documents from Tasmania and the Northern Territory reflected strong Risk Elimination stances and limited guidance.

The review also identified accessibility issues, with some documents difficult to locate or requiring navigation across multiple webpages—posing a barrier for caregivers seeking timely and clear information.

Key policy implications include the urgent need for a nationally harmonised, evidence-based framework that integrates Risk Minimisation principles. Such a framework should:

- Respect parental autonomy and cultural practices.
- Provide clear, non-judgmental guidance on safer shared sleep.
- Align sleep safety messaging with national breastfeeding strategies.
- Address higher SUDI rates among Indigenous infants through culturally responsive communication.
- Ensure resources are easily accessible via centralised platforms.

The authors recommend incorporating shared sleep education into antenatal and postnatal care and training health professionals in culturally sensitive communication. Consistent, practical, and empathetic messaging is essential to empower families and reduce the risk of SUDI.

101 Kruse SP, D'Souza L, Young J, and Tuncer HGG (2025) 'A systematic evaluation and comparison of the consistency of infant safer sleep messaging in Australia', *Front. Commun.* 10:1527164, doi.org/10.3389/fcomm.2025.1527164

## Learnings

### 2025 Australian and New Zealand Child Death Review and Prevention Conference

#### Findings from the review of Queensland Sudden Unexpected Death in Infancy (SUDI) cases between 2013–2016

**Dr Julie McEniery**
*Queensland Paediatric Quality Council*

At the 2025 Australian and New Zealand Child Death Review and Prevention Conference, hosted by the Commission, Dr Julie McEniery spoke to the QPQC's report ***Findings from the review of Queensland Sudden Unexpected Death in Infancy (SUDI) cases between 2013–2016***.

This presentation outlined critical insights from the review of SUDI cases which occurred in the sleep setting in Queensland between 2013 and 2016, aiming to deepen understanding and inform preventive strategies. Drawing from comprehensive case data, the review examined the circumstances, patterns, and contributing risk factors surrounding these tragic and unexpected infant deaths.

The findings of the review led to the development of a model of contributory factors which integrates infant vulnerabilities (such as in-utero tobacco exposure), modifiable sleep environment risks, developmental ability, and family circumstances, highlighting their cumulative and dynamic effects.

Recommendations stemming from the review include:

- Promoting universal safe sleep messages with targeted, culturally responsive support for vulnerable families, that align with the Queensland Health ***Safer infant sleep clinical guideline***.
- Enhancing postnatal support services for at-risk families.
- Strengthening interagency coordination and data sharing to identify early warning signs.
- Supporting frontline health workers with targeted training in SUDI prevention.

The presentation concluded with Dr Julie McEniery reinforcing the importance of community engagement and sustained public health efforts to reduce the incidence of SUDI and protect Queensland's most vulnerable children.

**View the presentation:** www.qfcc.qld.gov.au/2025/ANZCDRPG-Conference

**Read more:** www.childrens.health.qld.gov.au/__data/assets/pdf_file/0015/409110/sudden-and-unexpected-infant-deaths-during-sleep-in-Queensland-2013-2016.pdf