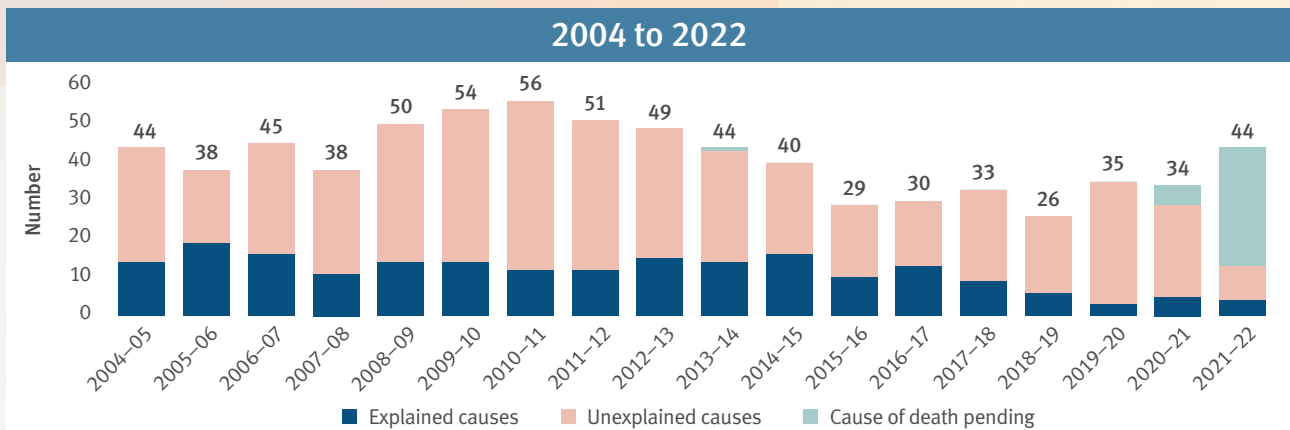
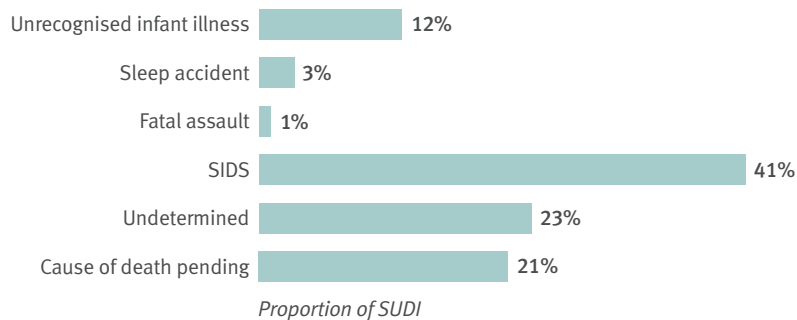


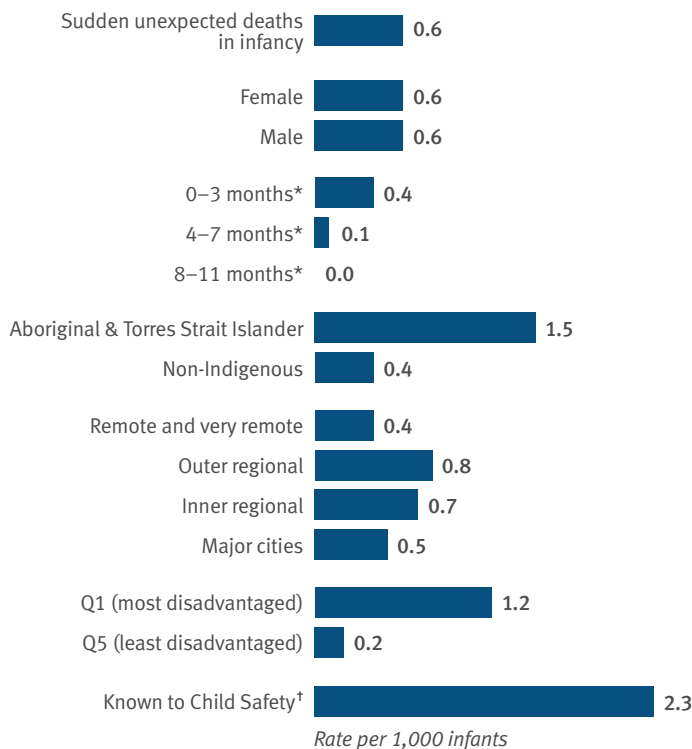
# 8 Sudden Unexpected Deaths in Infancy (SUDI)



### 5-year summary (2017-22) | Cause of death category



### Demographics | Key points



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

**44 SUDIs in 2021-22**  
Highest total in 8-years

**SIDS and undetermined cause**  
Remains unexplained after investigation  
Leading cause of death for infants 1-11 months

**Unsafe sleep factors present for many SUDIs**

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.

### Classification of Sudden unexpected death in infancy (SUDI)

SUDI is a research classification which 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. Cases of SUDI with an official cause of death are grouped into the following categories and sub-categories:

**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 illnesses or condition unrecognised at the time of death
- Sleep accidents
- Non-accidental injury (fatal assault)

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

- Sudden Infant Death Syndrome (SIDS)<sup>64</sup>
- Undetermined causes<sup>65</sup>

## Key findings

During 2021–22, there were 44 SUDI cases in Queensland, an increase from 34 in 2020–21 and the highest number of SUDIs in 8 years. Of the 44 SUDIs, 31 were pending a cause at the time of reporting—this reflects the longer timeframes for SUDI cases due to the complexity of the post-mortems and coronial investigation.

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

There were 172 SUDIs in the last 5 years, of which 63% were found to be unexplained SUDI (SIDS and undetermined causes) while 16% were explained SUDI (illness, sleep accident and fatal assault). A further 21% were pending a cause at the time of reporting.

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

Figure 8.1 shows the trends in the 5-year rolling rates of Aboriginal and Torres Strait Islander SUDIs, non-Indigenous SUDIs and all SUDIs in Queensland. The total SUDI rate has decreased between 2004–09 and 2017–22. Rates of Aboriginal and Torres Strait Islander SUDI dropped considerably between 2014 and 2020. The SUDI rate for Aboriginal and Torres Strait Islander infants was around 4 times the non-Indigenous SUDI rate between 2009 and 2016. The degree of over-representation has reduced over time to 3.4 times the non-Indigenous rate by 2017–22.<sup>66</sup>

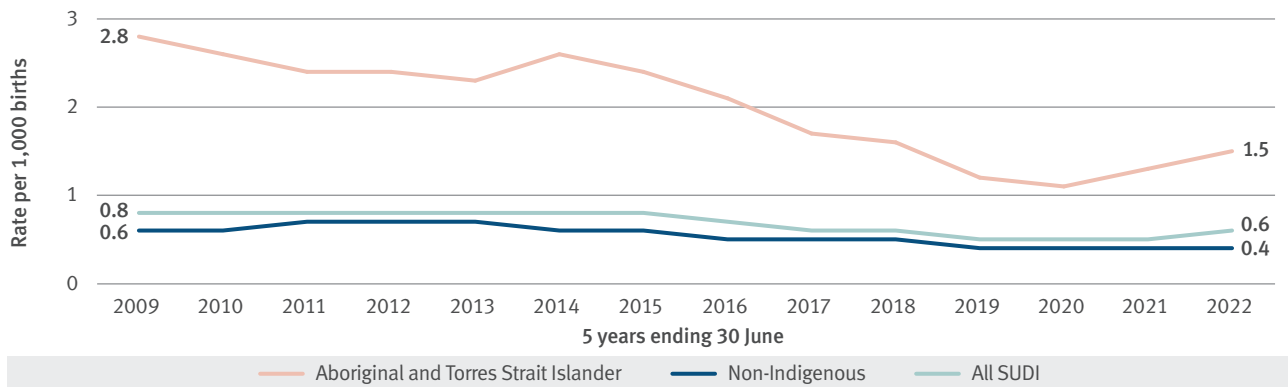
Discouragingly, in more recent periods the rates of both Indigenous and non-Indigenous SUDIs have been increasing.

<sup>64</sup> Krous HF, Beckwith JB, Byard RW, Rognum TO, Bajanowski T, Corey T, Cutz E, Hanzlick R, Keens TG, 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.

<sup>65</sup> 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.

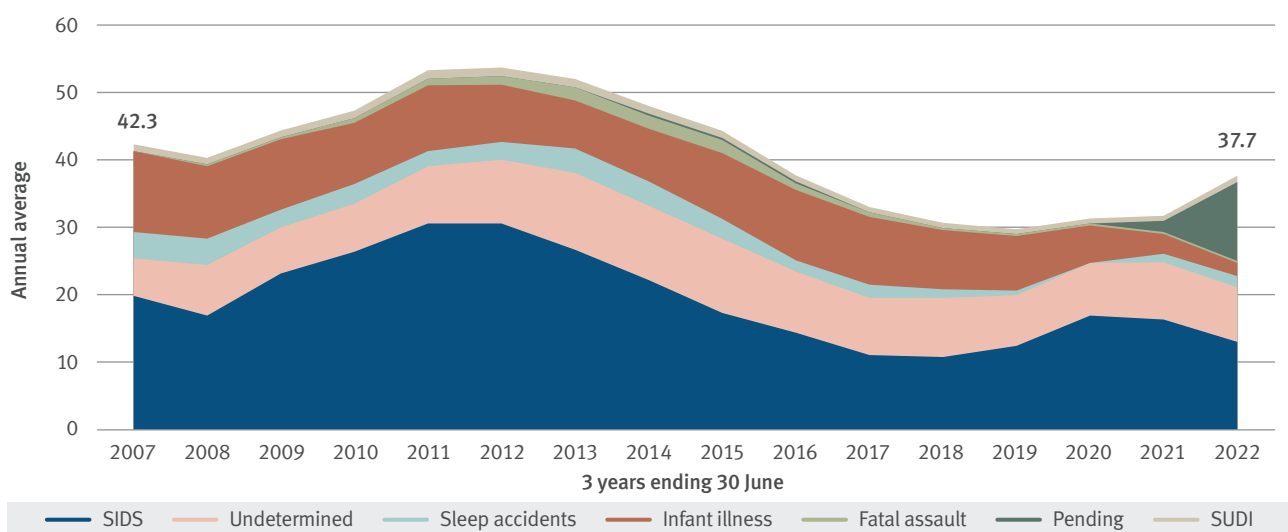
<sup>66</sup> Tables with data for 2004–2022 are available online at [www.qfcc.qld.gov.au/about-us/publications/child-death-reports-and-data](http://www.qfcc.qld.gov.au/about-us/publications/child-death-reports-and-data)

**Figure 8.1:** SUDI by Aboriginal and Torres Strait Islander status (5-year rolling rate), 2004–09 to 2017–22



Fluctuations in the number and causes of SUDIs (rolling average) are shown in Figure 8.2. While the number of SUDI deaths has decreased since 2011, average annual numbers have increased again since 2020.<sup>67</sup> While deaths from infant illness, undetermined causes and sleep accidents remained comparatively stable across the entire period, SIDS deaths rose and fell, driving the changes in SUDI totals. However, some caution is warranted as assigning definitive causes for SUDIs remains complex and developments in cause of death classification are ongoing.<sup>68</sup>

**Figure 8.2:** Cause of SUDI death (3-year rolling average number), 2004–07 to 2019–22



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

67 An expanded table on SUDIs since 2004 is available on the report web page.

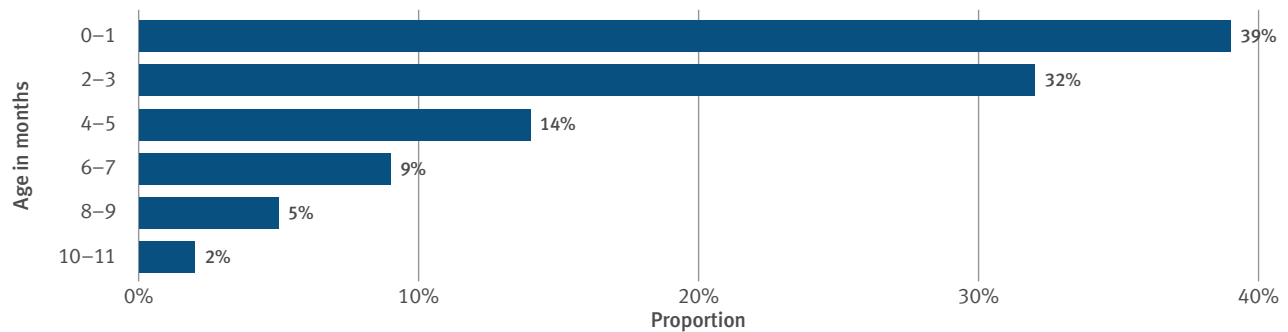
68 An expert panel review of Queensland post-neonatal SUDI deaths from 2013 recoded around half of the deaths to a different cause, with shifts occurring from explained to unexplained causes and vice versa. McEniery J, Cruice D (2018) 'The voice of the infant: Cause of death coding does not always reflect 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, accessed 12 August 2021. [www.childrens.health.qld.gov.au/chq/health-professionals/qpgc](http://www.childrens.health.qld.gov.au/chq/health-professionals/qpgc)

## Sex and age

A slightly larger proportion of SUDIs in the last 5 years were males (52% male compared with 48% female), but there was no difference in rates at 0.6 per 1,000 male/female births.

Figure 8.3 shows SUDI by age at death in the last 5 years. Two-thirds of sudden unexpected deaths (71%) occurred among infants aged 0–3 months.

**Figure 8.3:** SUDI by age in months (proportion), 2017–18 to 2021–22



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

## Risk factors for SUDI deaths

A number of factors have been associated with an increased risk of SUDI.<sup>69</sup> These can be classified according to whether they are associated with the infant, the family or the sleep environment.

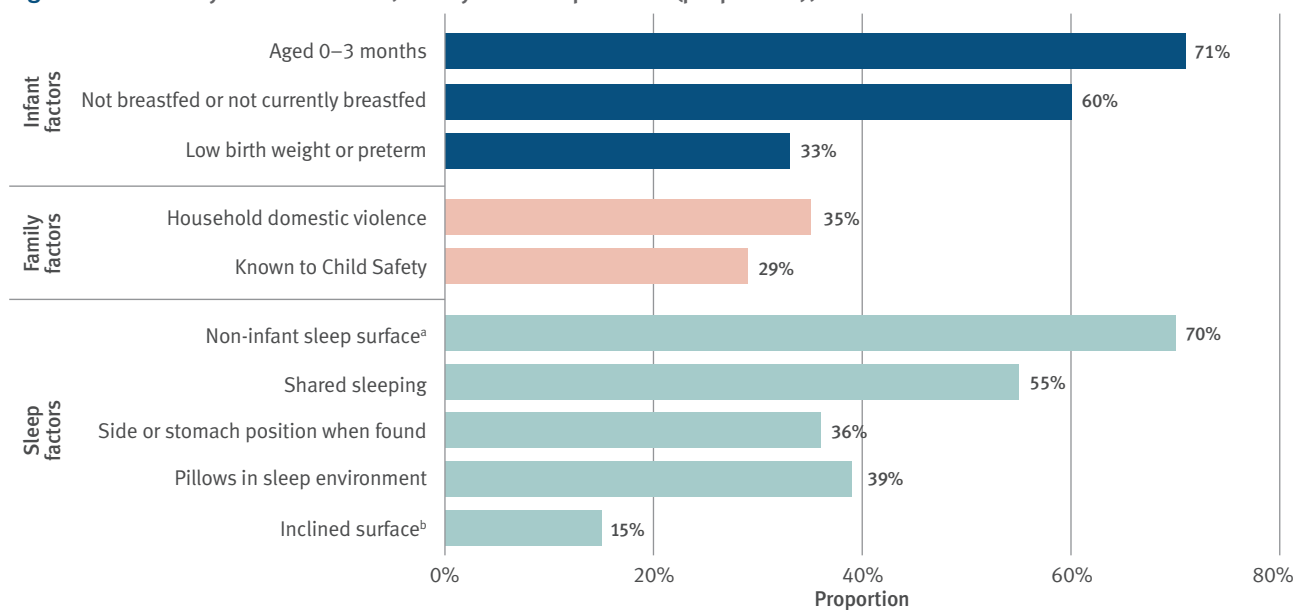
- **Infant factors:** Prematurity and low birth weight, multiple gestation (twins, triplets), neonatal health problems, male sex and recent history of minor viral respiratory infections and/or gastrointestinal illness.
- **Family factors:** Cigarette smoking during pregnancy and after birth, young maternal age ( $\leq 20$  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 171 SUDI deaths over the last 5 years are shown in Figure 8.4. These indicate increased risk in the first months and for infants born with low birth weight, and breastfeeding as a potentially protective factor.

Using non-infant sleep surfaces (70% of SUDIs), sharing a sleep surface (55%) and sleep position on side or stomach (36%) are all reported to increase the risk of sudden unexpected infant deaths, as are pillows (39%) and excess bedding in the sleep space.

<sup>69</sup> The Triple Risk Model proposes SUDI risk increases with combined factors of vulnerable infant; critical development period; and external stressors. [rednose.org.au/article/the-triple-risk-model](https://rednose.org.au/article/the-triple-risk-model).

Figure 8.4: SUDI by selected infant, family and sleep factors (proportion), 2017–18 to 2021–22



<sup>a</sup> 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).

<sup>b</sup> 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 SUDIs from fatal assault and neglect.

Clinical guidelines: Safer infant sleep	Safer sleep messages
<p>The Queensland Clinical Guidelines <i>Safer infant sleep</i> were released by the Queensland Paediatric Quality Council in 2022, describing infant care practices that are associated with reducing the risk of sudden unexpected deaths in infancy.<sup>70</sup></p> <p>The <i>Safer sleep messages</i> for SUDI risk-reduction practices are provided here.</p>	<p>Place infant in a safe sleep position in a safe sleep environment:</p> <ul style="list-style-type: none"> <li>• place infant on their back for every sleep</li> <li>• keep head and face uncovered</li> <li>• smoke free before and after birth</li> <li>• keep sleep space clear for every sleep</li> <li>• safe sleep place in the same room as caregiver for first 6–12 months</li> <li>• breastfeeding is recommended</li> </ul>

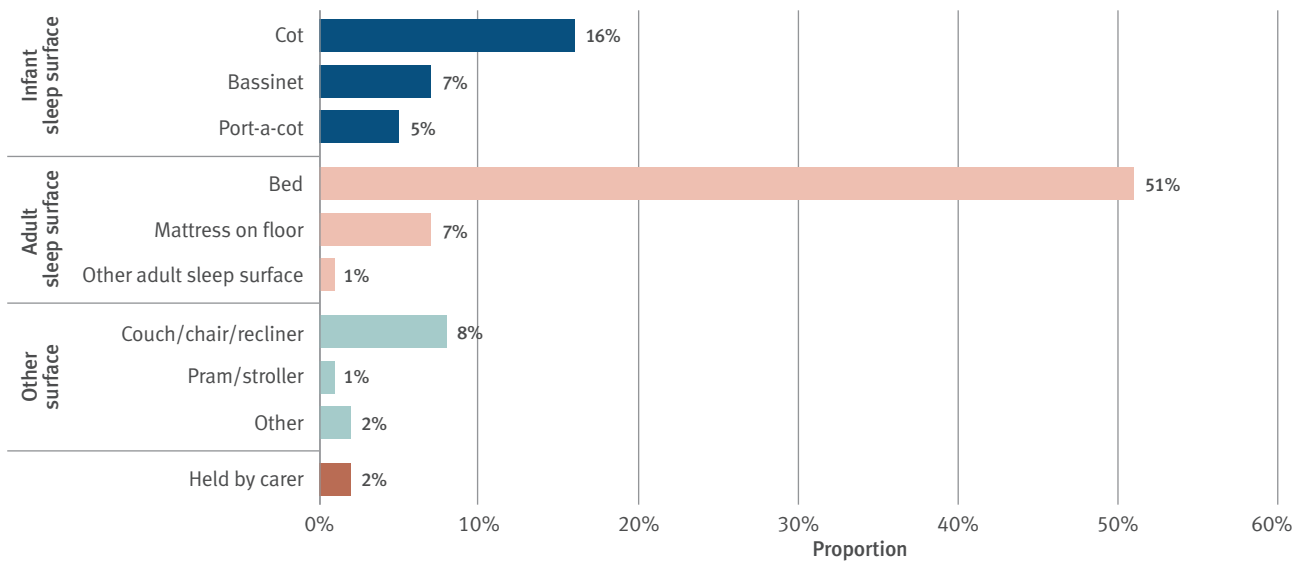
70 [www.childrens.health.qld.gov.au/chq/health-professionals/qpqc](http://www.childrens.health.qld.gov.au/chq/health-professionals/qpqc)

## Sleep environment factors

### Sleep surface

As indicated in Figure 8.5, in over half (59%) of SUDIs in the last 5 years the infant was on an adult sleep surface at the time of the incident and a further 8% were on a couch or recliner. Only 28% of the SUDIs occurred when an infant sleep product was being used.<sup>71</sup>

**Figure 8.5:** Sleep surface in SUDIs (proportion), 2017–18 to 2021–22



Notes: Excludes SUDIs 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 70 deceased infants in the last 5 years were placed and found on their back, a further 27 had moved from their back to stomach or side position when found. Of the 171 infants dying suddenly and unexpectedly, 77 were on their stomach or side when found (36% of SUDIs excluding those from non-accidental injury).

**Table 8.1:** Infant sleep position when placed and found (number), 2017–18 to 2021–22

Position when placed	Position when found						Total
	Back	Stomach	Side	Other	Held by carer	Unknown	
Back (supine)	70	23	4	3	0	5	105
Stomach (prone)	0	20	0	0	0	0	20
Side	1	6	6	0	0	2	15
Held by carer	2	2	1	4	5	0	14
Other	0	1	0	1	0	0	2
Unknown	1	3	1	0	0	10	15
<b>Total</b>	<b>74</b>	<b>55</b>	<b>12</b>	<b>8</b>	<b>5</b>	<b>17</b>	<b>171</b>

Notes: Excludes SUDIs from fatal assault and neglect.

<sup>71</sup> Percentages by surface types in Figure 8.5 may not add to sub-totals 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.<sup>72</sup> Information in the Child Death Register indicates 15% of SUDIs 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 pram/stroller, infant swing and infant car seat.

## Shared sleeping

Over half (94, 55%) of the infants whose deaths were sudden and unexpected were sharing a sleep surface with 1 or more people at the time of death. Not all shared sleeping was planned—in some incidents the carer has fallen 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.<sup>73</sup> 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 94 SUDIs in a shared sleep environment over the last 5 years, the following additional risk factors were identified:

- position in sleep environment, such as placed between 2 people or on top of a co-sleeping person (36%)
- alcohol or substance use (28%)
- tobacco (46%)
- extreme fatigue (17%)
- obesity (5%).

## Effectiveness of the Pépi-Pod® Program

The Queensland Paediatric Quality Council (QPQC) released the evaluation report *Measuring the effectiveness of the Pépi-Pod® Program in reducing infant mortality in Queensland* in 2022.<sup>74</sup> The Pépi-Pod® Program is a portable sleep space embedded in safe sleep education with a family invitation to share what they have learned about protecting babies as they sleep.

The findings demonstrated the Program's positive impact on Queensland's long standing high infant mortality rates. They also demonstrate the benefits of using a strength-based family partnership approach to integrate the Pépi-Pod® Program into the delivery of health services to families with young infants.

Given the clear potential for more families to be supported and more infant lives to be saved in Queensland with wider uptake of the Pépi-Pod® Program, the QFCC wrote in support of the report's recommendation that the program should be implemented without delay and upscaled to reach all priority Queensland populations.

<sup>72</sup> Queensland Health (2022) *Queensland Clinical Guidelines. Safer infant sleep*, Guideline No. MN22.71V1-R27. [www.childrens.health.qld.gov.au/chq/health-professionals/qpqc](http://www.childrens.health.qld.gov.au/chq/health-professionals/qpqc)

<sup>73</sup> Queensland Health (2022) *Queensland Clinical Guidelines. Safer infant sleep*, Guideline No. MN22.71V1-R27. [www.childrens.health.qld.gov.au/chq/health-professionals/qpqc](http://www.childrens.health.qld.gov.au/chq/health-professionals/qpqc)

<sup>74</sup> [www.childrens.health.qld.gov.au/chq/health-professionals/qpqc](http://www.childrens.health.qld.gov.au/chq/health-professionals/qpqc)

## Infant product safety

In August 2021 the QFCC made a submission to the Australian Competition and Consumer Commission's (ACCC) issue paper on safety options for inclined infant products such as rockers, bouncers, swings, co-sleepers, wedges, recliners, bassinet-type products and inclined sleep accessories. These products pose a risk if an infant sleeps while positioned at an incline and is contrary to safe sleep advice.

The QFCC [submission](#)<sup>75</sup> provided data from the Queensland Child Death Register and supported the option for a combination of mandatory safety standards and information standards for inclined infant sleep and non-sleep products.

### Industry guide for safe infant sleep environments

The *Best practice guide for the design of safe infant sleeping environments* was released in mid-2022 and provides a guide for industry to reduce the risk of death and life-threatening injuries in infants.<sup>76</sup>

## 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](#)). Five deaths of children aged 1–17 in 2021–22 were categorised as unexplained causes. Over the last 5 years, while 83% of unexplained deaths were infants, 11% were aged 1–4 years and 5% 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 inflicted.

<sup>75</sup> [www.qfcc.qld.gov.au/sector/policy/policy-submissions](http://www.qfcc.qld.gov.au/sector/policy/policy-submissions)

<sup>76</sup> [www.productsafety.gov.au/about-us/publications/best-practice-guide-for-the-design-of-safe-infant-sleeping-environments](http://www.productsafety.gov.au/about-us/publications/best-practice-guide-for-the-design-of-safe-infant-sleeping-environments)