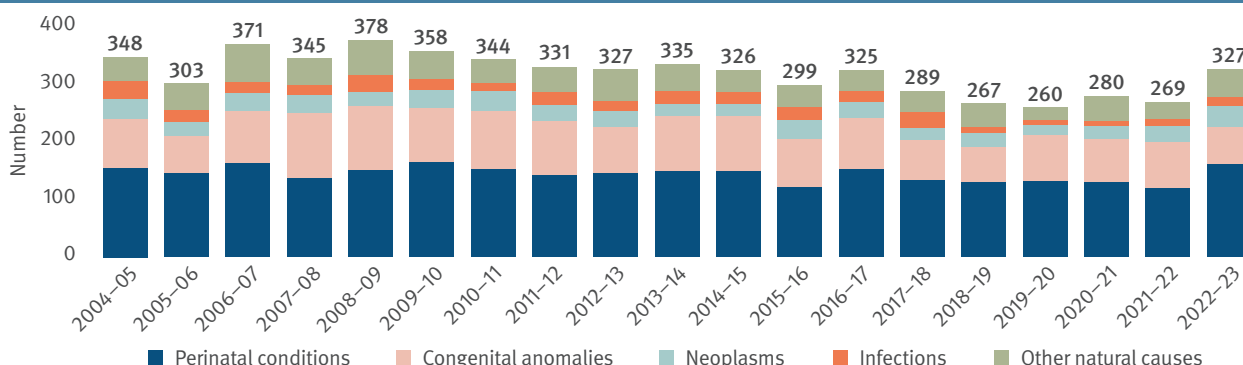
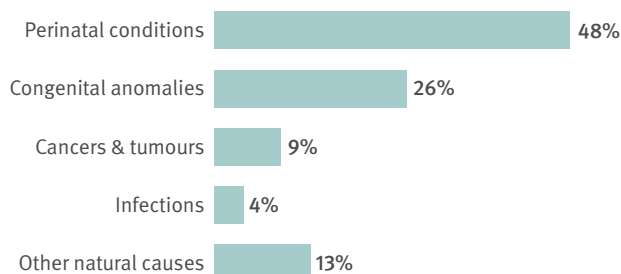


2 Deaths from natural causes

2004 to 2023

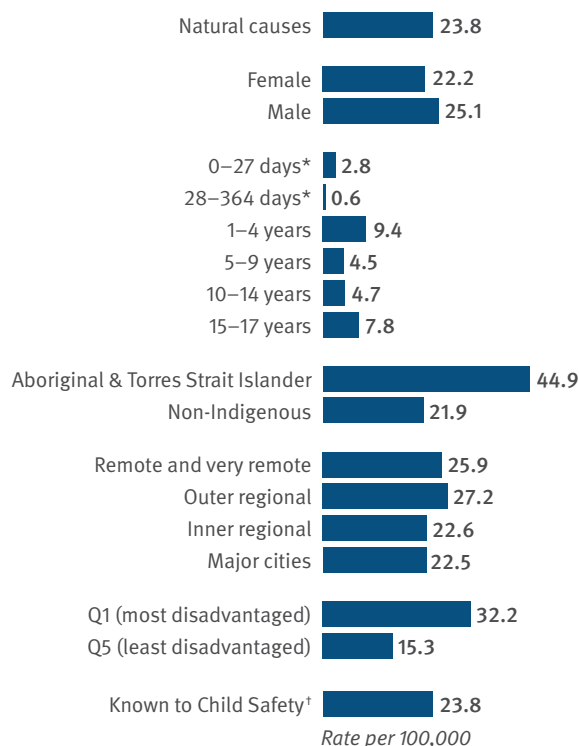


5-year summary (2018–23) | Cause of death category



Proportion of natural causes

Demographics



Rate per 100,000

Leading natural causes by age



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

Classification of causes of death using ICD-10

The QFCC uses the *International statistical classification of diseases and related health problems*, tenth revision²¹ (ICD-10) to classify causes of death. The ICD-10 chapters and codes form the major groups and sub-groups of diseases and conditions in reporting on deaths from natural causes.

Overall there has been a downward trend in the mortality rate for natural causes (diseases and morbid conditions),²² with the rate decreasing from 35.3 per 100,000 in 2004–09 to 23.8 per 100,000 in 2018–23 (a decrease of 2.3% per year on average).²³ The majority of child deaths each year are from natural causes. Natural causes have accounted for 70% of all child deaths over the past 5 years.

Perinatal conditions and congenital anomalies were the most common natural causes in 2022–23 (161 and 66 deaths respectively). Together, these causes accounted for 69% of all deaths from natural causes.

Appendix A, Table A.4 provides summary data and key characteristics for deaths from natural causes.

Recent increase in natural cause deaths

Although the broader trend in the natural causes mortality rate is decreasing, there was a single year increase in 2022–23, 327 up from 269 deaths in 2021–22 (22% increase). The increase does not appear to be due to deaths from coronavirus (COVID-19)—only 4 child deaths have been directly attributed to COVID-19 in Queensland—although the pandemic may have had indirect impacts on child health and mortality. Interestingly, the COVID-19 Mortality Working Group has found an excess in total deaths of 20,000 in Australia in 2022, with roughly two-thirds related to COVID-19, but a further one-third were not related to COVID-19.²⁴

Further review of the Register data indicates the following changes contributed to the 22% increase in natural cause deaths in the last year:

- The largest contributor to the increase was deaths from perinatal conditions, which increased from 120 to 161 (up 34%). Deaths from perinatal conditions, which predominantly occur in the neonatal period (0–27 days), are the largest contributor to child deaths. It is therefore understandable that an increase here is reflected in the overall number. The QFCC has no information to explain the increase in deaths from perinatal conditions at this time.
- Other increases were in neoplasms, with an increase in deaths from 27 to 36 (up 33%), and nervous system diseases, increasing from 20 to 30 deaths (up 50%). These changes made less of a contribution due to the smaller numbers involved.

While the QFCC has noted the increase in natural cause deaths, we also advise caution in interpreting changes. Year to year fluctuations can occur without these necessarily indicating a change in the underlying trend.

Sex

In 2022–23, of the 327 child deaths from natural causes 175 were male while 151 were female (in addition was an infant of indeterminate sex). Child mortality from natural causes is marginally higher for males than females. Over the last 5 years, the male mortality rate was 25.1 deaths per 100,000 male children compared to 22.2 deaths per 100,000 female children.

21 www.who.int/standards/classifications/classification-of-diseases

22 Deaths are reported as explained diseases and morbid conditions only. Deaths from unexplained causes are included in [Chapter 8](#).

23 Tables with data for 2004–23 are available online at www.qfcc.qld.gov.au/sector/child-death/child-death-reports-and-data

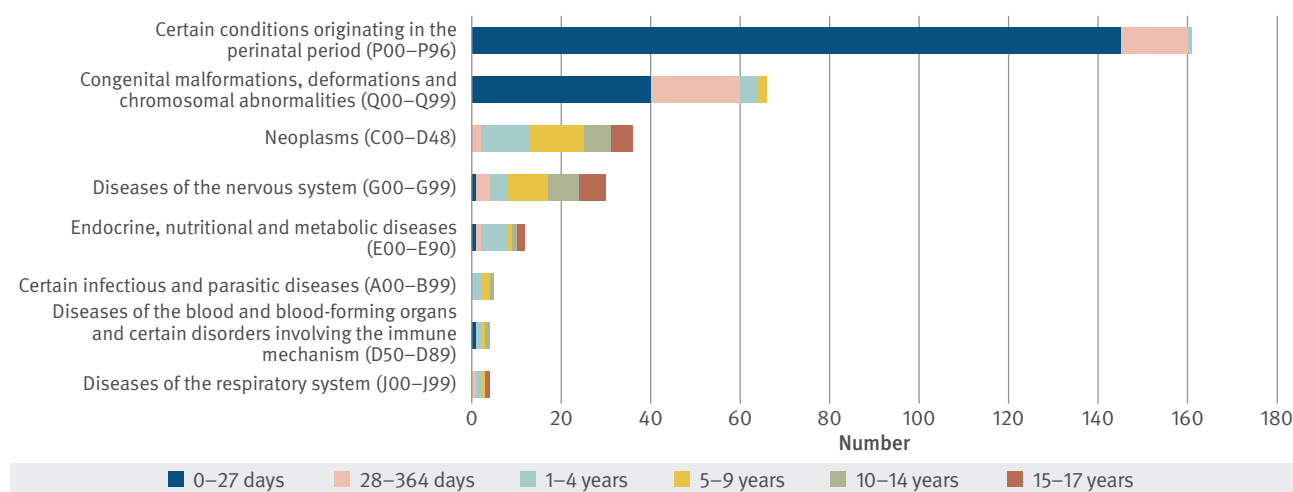
24 Actuaries Institute (2023) *Confirmation of 20,000 excess deaths for 2022 in Australia*, www.actuaries.digital/2023/04/06/covid-19-mortality-working-group-confirmation-of-20000-excess-deaths-for-2022-in-australia/

Age

Figure 2.1 illustrates the types of natural cause deaths for each age category in 2022–23. The following findings were evident:

- Almost all natural causes of death for infants (under 1 year) were from perinatal conditions and congenital anomalies (93% of all natural causes within this age group).
- Neoplasms (cancers and tumours) was the primary natural cause for children aged 1–9 years.
- Diseases of the nervous system was the primary natural cause for children age 10–17 years, closely followed by neoplasms.

Figure 2.1: Deaths from natural causes by ICD-10 chapter and age (number), 2022–23



Notes: Excludes causes where the total number of deaths was less than 4.

Neonatal and post-neonatal infants

Most child deaths from natural causes occur in the first year, predominantly within the first days and weeks of life. Table 2.1 shows the age and causes of infant deaths in major groups in the last 5 years, across the neonatal and post-neonatal periods.

Neonatal period (0–27 days)

Neonatal deaths are those occurring in the first 28 days after birth (0–27 days). Of the 1,054 infant deaths due to natural causes in the last 5 years, 82% occurred in the neonatal period. Of the 866 neonatal deaths, 61% occurred on the day of birth and a further 20% had occurred by the end of the first week.

The 2 leading causes—perinatal conditions (611 deaths) and congenital anomalies (233 deaths)—represent 97% of the neonatal deaths from natural causes.

Post-neonatal period (28–364 days)

Post-neonatal deaths occur during the remainder of the first year (28–364 days). During the last 5 years, there were 188 deaths from natural causes during the post-neonatal period. The leading cause of death from natural causes in the post-neonatal period was congenital anomalies (80 deaths or 43%).²⁵

²⁵ The leading overall cause of death in the post-neonatal period was SIDS and undetermined causes, see Table 1.1.

Table 2.1: Age and cause of infant deaths from natural causes (number), 2018–19 to 2022–23

Age		Cause of death			Total
		Perinatal conditions (P00–P96)	Congenital anomalies (Q00–Q99)	Other diseases and morbid conditions ^a	
Neonatal (age in days)	<1	371	154	5	530
	1–6	122	45	2	169
	7–27	118	34	15	167
Neonatal total		611	233	22	866
Post-neonatal (age in months)	1*	32	26	12	70
	2	9	14	9	32
	3	1	6	8	15
	4	2	11	3	16
	5	4	4	4	12
	6	1	7	6	14
	7	0	5	5	10
	8	1	2	1	4
	9	1	1	4	6
	10	1	2	1	4
	11	2	2	1	5
Post-neonatal total		54	80	54	188
Total infants		665	313	76	1,054

* 28 days to <2 months.

^a Includes certain infectious and parasitic diseases (A00–B99); neoplasms (C00–D48); diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50–D89); endocrine, nutritional and metabolic diseases (E00–E90); diseases of the nervous system (G00–G99); diseases of the circulatory system (I00–I99); diseases of the digestive system (K00–K93); diseases of the respiratory system (J00–J99); diseases of the musculoskeletal system and connective tissue (M00–M99); diseases of the genitourinary system (N00–N99); symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99); codes for special purposes (U00–U49).

Major causes

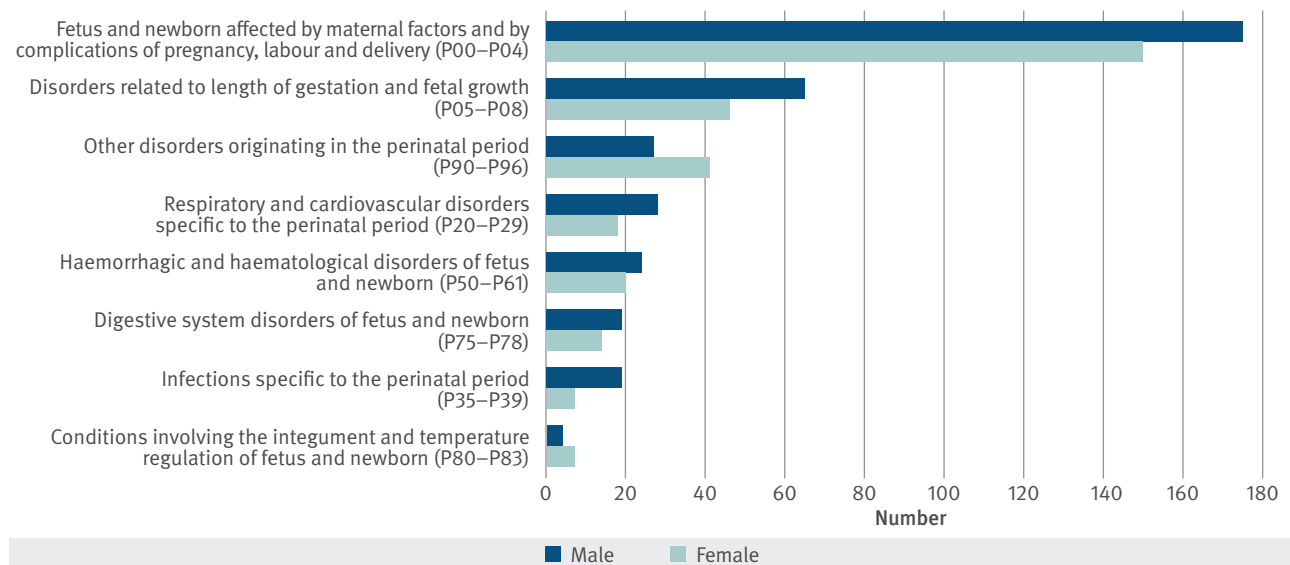
Perinatal conditions

Perinatal conditions are diseases and conditions which originate during pregnancy or the neonatal period (first 28 days of life), even though death or morbidity may occur later. Perinatal conditions include maternal conditions which affect the newborn, such as complications of labour and delivery, disorders relating to fetal growth, length of gestation and birth weight, as well as disorders specific to the perinatal period such as respiratory and cardiovascular disorders, infections, and endocrine and metabolic disorders.

During 2022–23, there were 161 child deaths from perinatal conditions, at a mortality rate of 11.4 deaths per 100,000 children aged 0–17 years (5-year average). Perinatal conditions was the leading cause of death for infants (under 1 year).

As shown in Figure 2.2, over the past 5 years the majority of deaths due to perinatal conditions resulted from the fetus and/or newborn being affected by maternal factors or complications of pregnancy, labour and delivery (49%, 327 deaths), followed by disorders related to the length of gestation and fetal growth (17%, 111 deaths). Together, these causes accounted for 65% of all deaths due to perinatal conditions (438 of 672 deaths).²⁶

²⁶ Noting a small number of deaths from perinatal conditions occur in children aged 1 year and over.

Figure 2.2: Deaths due to perinatal conditions by sex (number), 2018–19 to 2022–23

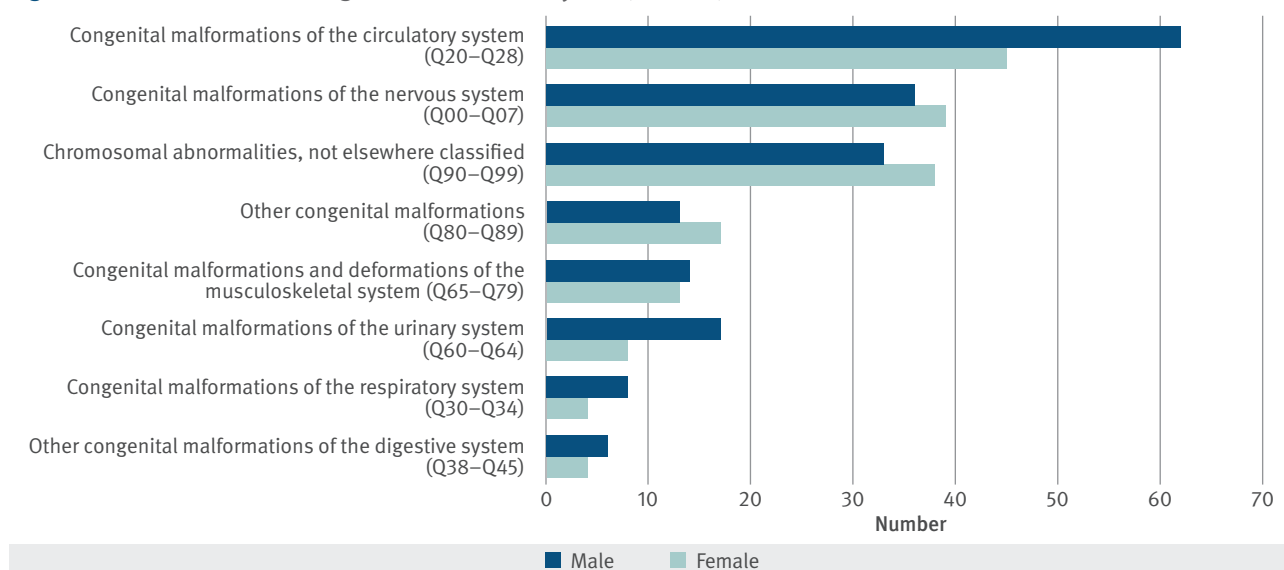
Notes: Excludes causes where the total number of deaths was less than 4. Excludes 3 deaths of infants of indeterminate sex.

Congenital anomalies

Congenital anomalies are mental and physical conditions present at birth which are either hereditary or caused by environmental factors.²⁷

During 2022–23, there were 66 child deaths from congenital anomalies, at a 5-year average rate of 6.1 deaths per 100,000 children aged 0–17 years.

As shown in Figure 2.3, over the last 5 years the leading causes of death due to congenital anomalies were malformations of the circulatory system (30%, 107 deaths) and congenital malformations of the nervous system (21%, 76 deaths).

Figure 2.3: Deaths due to congenital anomalies by sex (number), 2018–19 to 2022–23

Notes: Excludes causes where the total number of deaths was less than 4. Excludes 1 death of an infant of indeterminate sex.

27 ICD-10 Chapter XVII, Congenital malformations, deformations and chromosomal abnormalities.

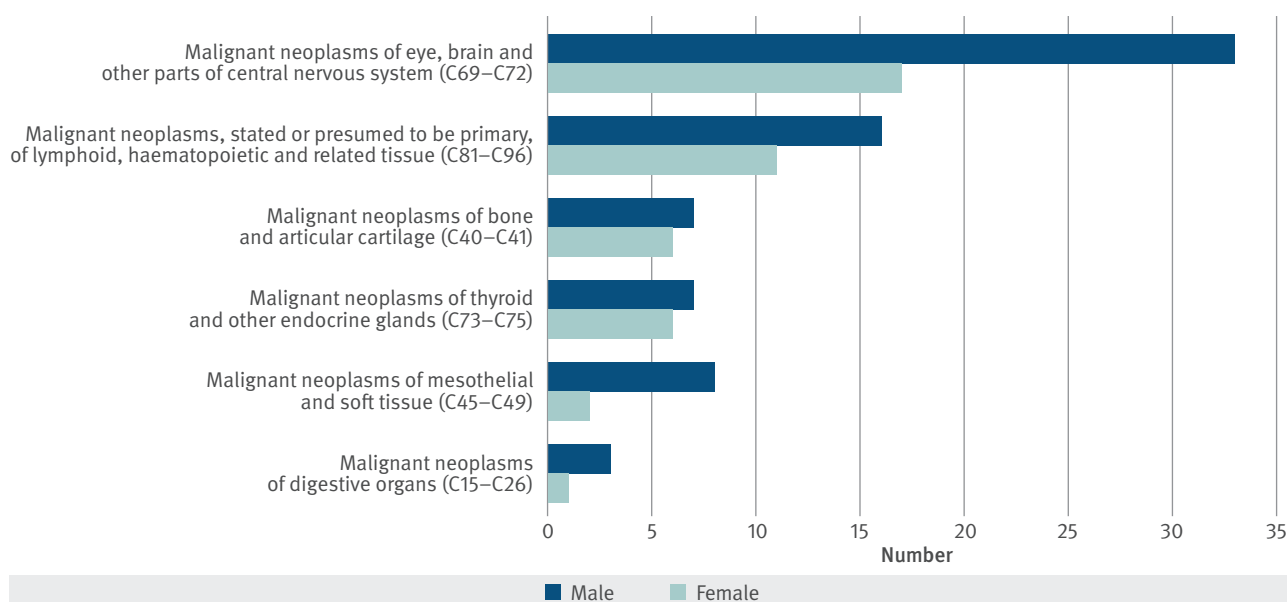
Neoplasms (cancers and tumours)

The term ‘neoplasm’ is often used interchangeably with the words ‘tumour’ and ‘cancer’.²⁸

Thirty-six children and young people died from neoplasms in 2022–23, at a 5-year average rate of 2.2 deaths per 100,000 children aged 0–17 years. As noted in **Chapter 1**, neoplasms were the leading cause of death (all causes) for ages 5–9 years, and the leading natural cause of death for ages 1–4 years, 10–14 years and 15–17 years.

Over the last 5 years, 129 children lost their lives to cancers and tumours. As illustrated in Figure 2.4, the most common types were malignant neoplasms of eye, brain and other parts of central nervous system (50 deaths or 39%), followed by malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue (27 deaths or 21%).

Figure 2.4: Deaths due to neoplasms by sex (number), 2018–19 to 2022–23



Notes: Excludes causes where the total number of deaths was less than 4.

Infections

‘Infections’ is a hybrid category composed of certain infections and parasitic diseases, diseases of the nervous system and diseases of the respiratory system.²⁹

Fifteen children died from infections in 2022–23. Over the last 5 years, 56 children and young people died from infections. The highest number of infections were caused by influenza and pneumonia (15 deaths or 27%).³⁰

28 ICD-10 Chapter II, Neoplasms.

29 ICD-10 references: Chapter I, Certain infectious and parasitic diseases; Chapter VI, Diseases of the nervous system, codes G00–G09 only; Chapter X, Diseases of the respiratory system, codes J00–J22 only, Chapter XXII, Codes for special purposes, COVID 19 codes U07.1–U07.2 only.

30 ICD-10 Chapter X, Diseases of the respiratory system, Influenza and pneumonia (J09–J18).

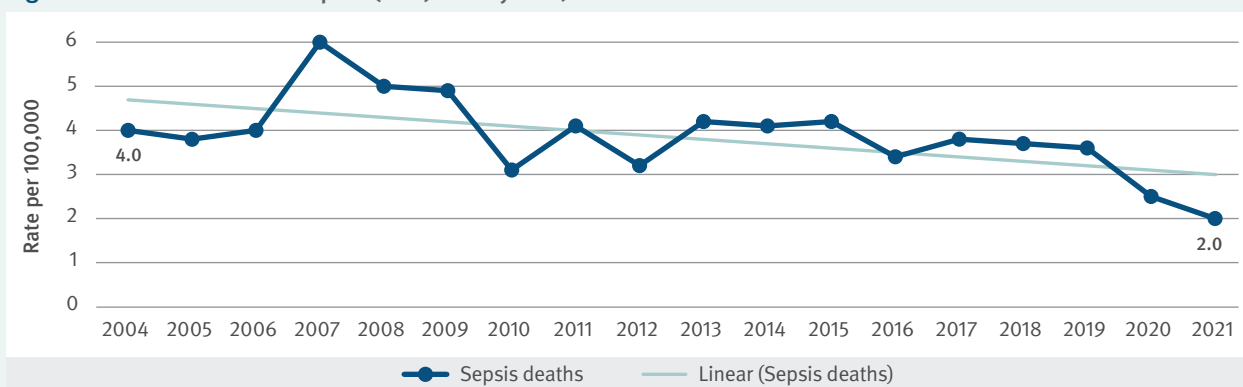
Paediatric sepsis mortality study

Sepsis—a life threatening condition that occurs when the body’s response to an infection damages the organs and tissues—is a significant cause of preventable childhood mortality worldwide. The QFCC, in collaboration with the Queensland Paediatric Sepsis Program (QPSP) at Children’s Health Queensland, is undertaking the paediatric sepsis mortality project.

The overarching aim of the study is to identify and describe the incidence of deaths due to sepsis in children aged less than 18 years in Queensland. As sepsis-related deaths may not be readily apparent in cause of death information, the project team developed a methodology to identify relevant deaths from ICD-10 mortality and morbidity codes, based on the internationally accepted approach which has been in use since the early 2000s.

Findings show that between 1 January 2004 and 31 December 2021, there were 748 sepsis-related deaths of infants and children aged 0–17 years in Queensland, a rate of 3.8 deaths per 100,000 children and young people.³¹ Encouragingly, as shown in Figure 2.5, rates for all sepsis-related deaths declined significantly across the study period. Sepsis deaths were highest among infants and pre-school-aged children, with primary-school aged children (5–11 years) having the lowest rates of death. Aboriginal and Torres Strait Islander children, children living in remote and very remote areas and children living in areas with socio-economic disadvantage were also over-represented.

Figure 2.5: Deaths due to sepsis (rate) 0–17 years, 2004 to 2021



Source: QFCC Queensland paediatric sepsis mortality study (pending publication).

³¹ The report, once published, will be available at www.qfcc.qld.gov.au/safer-pathways-through-childhood

Deaths from notifiable conditions

There are national and local public health legislation requirements for health practitioners and laboratories to notify public health authorities of certain diseases in Australia.³² Key factors considered when deciding if a condition should be notifiable include the overall impact of the disease on morbidity and mortality, potential for control, demonstrated public health concern and the availability of control measures. Notification allows authorities to detect outbreaks early and take rapid public health action, if necessary, and to plan and monitor these efforts. It also provides information on the occurrence of disease.

Thirty children and young people died from a notifiable condition over the latest 5-year period as shown in Table 2.2. Thirteen (43%) of the 30 deaths due to notifiable conditions were the result of potentially vaccine-preventable conditions, with the most common of these being invasive pneumococcal disease.^{33,34}

COVID-19 was added to Queensland's Schedule of Notifiable Conditions in the *Public Health Regulation 2018* in January 2020. There were 4 child deaths due to coronavirus (COVID-19) during the 5-year reporting period.³⁵

Table 2.2: Deaths with notifiable conditions as underlying cause (number), 2018–19 to 2022–23

Notifiable condition	Total
Pneumococcal disease (invasive)^	9
Invasive group A streptococcal infection	7
Coronavirus (COVID-19)*	4
Influenza^	3
Rheumatic heart disease	2
Salmonellosis	2
Melioidosis	1
Meningococcal disease (invasive)^	1
Respiratory syncytial virus	1
Total	30

^ Potentially vaccine-preventable condition. Vaccines are available for selected strains of meningococcal, seasonal influenza and selected serotypes of pneumococcal disease. Serotyping information in relation to influenza, meningococcal and pneumococcal-related deaths is not available to the QFCC, and so deaths are reported as being potentially vaccine-preventable only.

* Vaccines became available for coronavirus (COVID-19) for children at the end of this reporting period, therefore it has not been included as a potentially vaccine-preventable condition for this current report.

Notes: The child deaths with notifiable conditions in this report may differ from communicable disease reports which use date of notification or date of onset of disease to define the reporting period. The deaths reported by QFCC use date of death registration to define the reporting period, which may occur sometime after the notification of disease.

32 The Queensland Health list of notifiable conditions can be found at www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/notifiable-conditions/list

33 In Australia, publicly funded immunisation programs are administered by state and territory governments. The current National Immunisation Program Schedule (valid from April 2019) includes vaccinations against the following diseases: hepatitis B, diphtheria, tetanus, pertussis (whooping cough), poliomyelitis, Haemophilus influenzae type b (Hib), pneumococcal disease, rotavirus, measles, mumps, rubella, meningococcal ACWY disease, varicella (chicken pox), influenza and human papillomavirus (HPV).

34 Vaccines are available for only selected strains of influenza, meningococcal disease and pneumococcal disease.

35 Information in this report on child deaths with notifiable diseases, including COVID-19, may differ from official reporting by Queensland Health due to different methodology. Further information about the QFCC's methodology can be found in the Methodology in [Appendix B](#) (available at www.qfcc.qld.gov.au/sector/child-death/child-death-reports-and-data).