



HEALTH QUALITY & SAFETY
COMMISSION NEW ZEALAND

Kupu Taurangi Hauora o Aotearoa

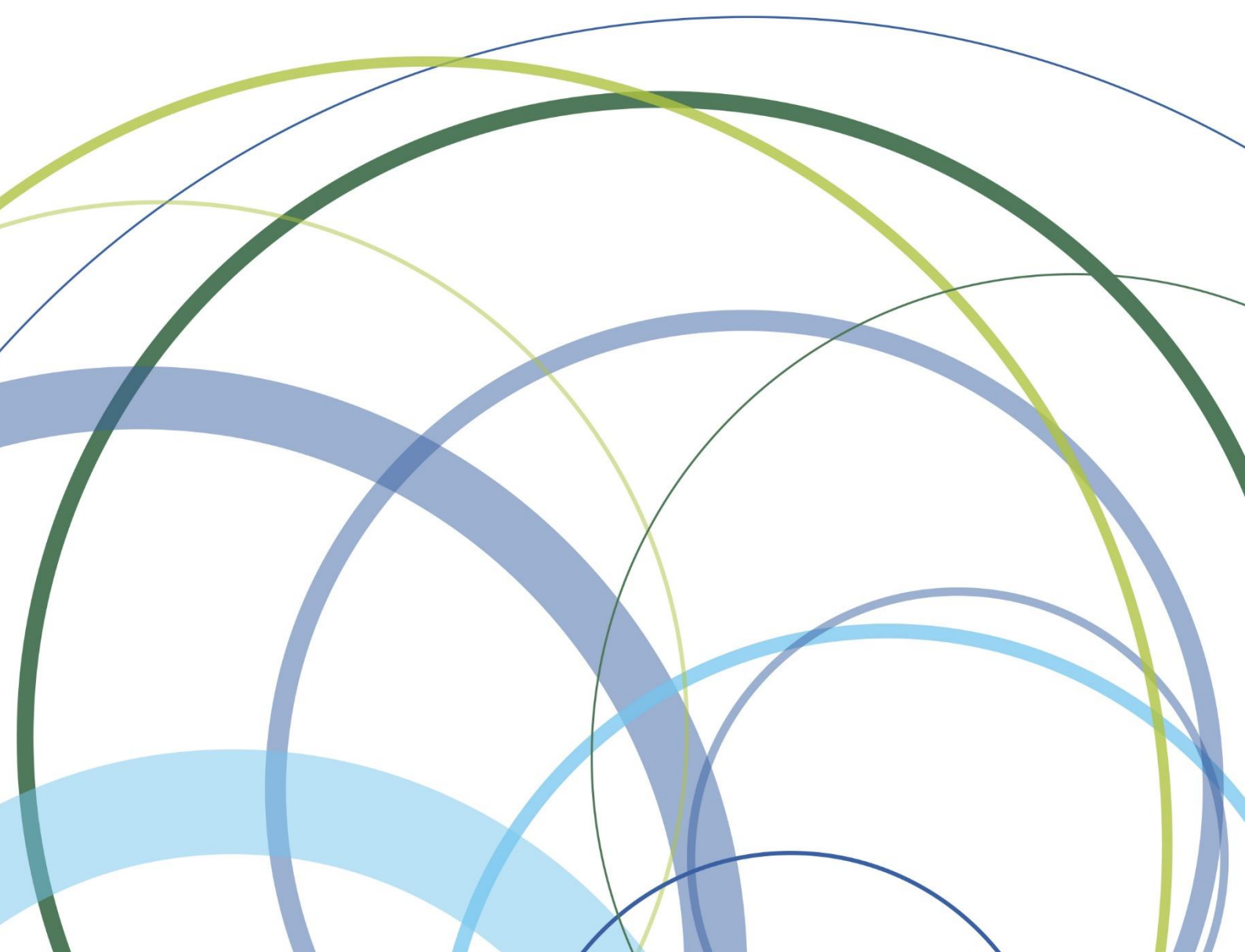


Child and Youth
Mortality Review
Committee

14th data report

Te pūrongo raraunga 14

2013-17



*Haere ra e hika koutou ko o matua
Unuhia i te rito o te harakeke
Ka tu i te aroakapa
Aku nui aku rahi e
Aku whakatamarahi ki te rangi
Waiho te iwi e
Mana e mae noa ...*

*Farewell oh child to the land of your ancestors
Plucked like the simple shoot of the flax frond
I can still see you in the haka
My beautiful loved child of whom I boasted to the skies
You leave behind your people wailing, bereft.*



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Acknowledgements | He mihi

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Chair's introduction | Te kupu whakataki a te manukura

Welcome to the 14th data report of the Child and Youth Mortality Review Committee (the CYMRC).

The CYMRC collects information on the deaths of children and young people aged 28 days to 24 years. This information has been collected since 2002 to identify any trends in age, sex, ethnicity, place of residence and cause of death. It is published in this annual data report, which is a monitoring tool that highlights national trends. This helps the CYMRC and policy makers, researchers, district health boards, primary health organisations, non-governmental organisations, and anyone working in child and youth health, to identify what needs to be investigated further.

The report highlights inequitable outcomes being experienced within Aotearoa/New Zealand. This report shows that children and young people living in areas of greater disadvantage have higher mortality rates. It also highlights the vast inequities for Māori and Pacific peoples who have high mortality rates.

The CYMRC believes these differences in outcomes, which unfairly privilege one population over another, are fully avoidable and unjust. Our ethnicity data shows that we require much greater ongoing commitment and focus to achieve health equity for our Māori tamariki and rangatahi in Aotearoa/New Zealand. In particular, we need to challenge the persistent and systemic bias within our society that produces and tolerates unfair health outcomes. We all have a responsibility under te Tiriti o Waitangi to reduce these inequities. This is a priority for the CYMRC and for the Minister of Health, who states in his letter of expectation to the Health Quality & Safety Commission:

Achieving equity within the New Zealand health system underpins all of my priorities ... There needs to be an explicit focus on achieving equity for Māori across their life course (Minister of Health, Hon Dr David Clark, 2019).

Although this is a data report, it represents the lives of the many children and young people who have died far too young. My heart goes out to the families, whānau and communities that have experienced this heartbreak. Knowing that many of these deaths can be prevented is what drives my work and that of the CYMRC.

I would like to acknowledge my CYMRC colleagues – those on the national committee and all who participate in the local review groups. I am also very grateful to Dr Gabrielle McDonald and her team at the University of Otago New Zealand Mortality Review Data Group for analysing the data and writing this report, as well as the mortality review committee secretariat at the Health Quality & Safety Commission for coordinating other aspects of report production.

Dr Felicity Dumble
CYMRC Chair

Executive summary | Whakarāpopototanga matua

This report describes mortality in children and young people, predominantly for the years 2013–17. Overall, there were 536 deaths in children and young people in 2017. Medical conditions were the leading broad category of death, followed by unintentional injury (predominantly transport related). The next leading category was intentional injury, which includes deaths due to suicide and assault. Almost all deaths in this category were due to suicide.

By individual cause of death, over the past five years, most deaths were from suicide (n=577), followed by transport incidents (n=481), cancers (n=238) and sudden unexpected death in infancy (SUDI) (n=195).

Mortality is not evenly distributed in the population, with rates higher in Māori and Pacific children and young people, compared with those in other ethnic groups. Mortality rates are also highest in areas of high deprivation, with those in the New Zealand Deprivation Index decile 10 being 2.5 times more likely to die than those in decile one. Therefore, Māori and Pacific communities have a large burden of mortality. This is due to the additive effect of their overall mortality rates being higher, and the over-representation of Māori and Pacific children and young people living in areas of high deprivation, and because of the inequitable distribution of resources in Aotearoa/New Zealand.

Mortality in tamariki and rangatahi Māori

During the five-year period 2013–17, there were 931 deaths in tamariki and rangatahi Māori. The leading categories of death were medical conditions (32.1 percent) followed by intentional injury (28.7 percent). The most common medical condition causing death was neoplasms. Large inequities remain in mortality rates for tamariki and rangatahi Māori, compared with non-Māori non-Pacific children and young people. This is most notable for SUDI and sudden unexpected death (SUD), where the rate ratio comparing Māori with non-Māori non-Pacific is 8.41 (95 percent confidence interval (CI) 5.90–11.97), and for intentional injury deaths, where the rate ratio is 2.35 (95 percent CI 2.00–2.77). Eighty-nine percent of intentional injury deaths were due to suicide, with marked inequities in the suicide rate between Māori and non-Māori non-Pacific occurring from the age of 10 years upwards. The Child and Youth Mortality Review Committee and Suicide Mortality Review Committee, together with Ngā Pou Arawhenua, are currently investigating this marked inequity in suicide rates, particularly the structural influences that place rangatahi at risk of suicide. Given the disproportionate impact of deprivation in Māori mortality, significant progress needs to be made in reducing poverty to reduce inequities.

Mortality in Pacific children and young people

During 2013–17, 374 Pacific children and young people died. Nearly half of these deaths (46.8 percent) were due to medical conditions. While the number of deaths in Pacific children and young people have fluctuated, overall no clear trends are evident of either an increase or a decrease in the number of deaths. Marked inequities between Pacific and non-Pacific non-Māori children exist, with Pacific infants being much more likely to die overall (rate ratio 2.62, 95 percent CI 2.04–3.35) and much more likely to die from SUDI (rate ratio 6.42, 95 percent CI 4.28–9.63). For every age group, excluding those aged five to nine years, Pacific children and young people were more likely to die overall, and to die from medical conditions, compared with non-Pacific non-Māori

children and young people. In those aged 10–14 years and 15–19 years, Pacific children and young people were more likely than non-Pacific non-Māori children to die from intentional injury (predominantly suicide).

SUDI

During the 16 years from 2002 to 2017, 765 deaths were due to SUDI. Forty-five of these deaths were in 2017. When examined by broad ethnic categories, the inequities are clear, with Māori having a higher SUDI rate than those of non-Māori non-Pacific ethnicities. Furthermore, after two periods of some gains being made, the SUDI rate for Māori infants appears to be plateauing. The SUDI mortality rate for Pacific infants fluctuates somewhat, but over the past 10 years there is some evidence of an increase in the SUDI rate.

Suicide

During the years 2002–17, 1,887 deaths were due to suicide. In 2017, there were 131 suicide deaths in children and young people aged 10–24 years. While at younger ages there is no difference in the number of deaths between males and females, male deaths predominate overall, with a male to female ratio of 2.5. Deaths peak at age 20 years and reduce thereafter. By broad ethnic group, deaths in Māori have an earlier (younger) onset. Deaths due to suicide were more frequent in those residing in high-deprivation areas, as measured by the New Zealand Deprivation Index decile.

Transport

In the years 2002 to 2017 inclusive, there were 2,128 deaths in children and young people aged 28 days to 24 years due to transport. In 2017, there were 98 deaths. While the number of deaths has been consistent over the past five-year period, a large reduction in deaths has occurred since 2002, with mortality reducing in the groups aged 15–19 years and 20–24 years. Of all transport deaths, most were car occupants (64.2 percent), 12.9 percent were pedestrians and 7.1 percent were motorcyclists. Pedestrian deaths were in all ages, with peaks in those aged one to four years and 15–24 years. Car occupant mortality peaked in those aged 18 years. The highest mortality rates for cyclists were seen in those aged 10–14 years. For all types of transport death, deaths in males far outnumbered those in females. Marked disparities were evident by ethnicity, particularly in car occupant and pedestrian deaths, with Māori having significantly higher rates than non-Māori non-Pacific children and young people.

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Abbreviations

CI	confidence interval
CYMRC	Child and Youth Mortality Review Committee
DHB	District health board
LCYMRG	Local child and youth mortality review group
MELAA	Middle Eastern, Latin American and African
nMnP	non-Māori non-Pacific
NZMRDG	New Zealand Mortality Review Data Group
SUD	Sudden unexpected death
SUDI	Sudden unexpected death in infancy

Method | Te tukanga

Overview

The Child and Youth Mortality Review Committee (the CYMRC) was established in 2002.

The review process has evolved since then, with many people and organisations involved in providing information, reviewing deaths, collating information, and analysing and reviewing collated data. Particular processes central to mortality review are: information-gathering and review of individual deaths in the district health board (DHB) region where the person resided; and national data collection and collation.

The following steps are undertaken in the context of case review and data collation.

1. National organisations and some individuals, families and whānau provide information directly to the New Zealand Mortality Review Data Group (NZMRDG).
2. The information held centrally is available for use at local review meetings through DHB-appointed CYMRC local review group coordinators.
3. Following the review of each death, CYMRC coordinators add further information to the national database.
4. The NZMRDG collates and analyses information held in the national database for the CYMRC.
5. The CYMRC reviews the collated case information as well as locally identified issues, recommendations and actions. This provides a detailed overview of regional and national trends, which inform prevention strategies and support recommendations at both a local and national level.

Mortality review is undertaken to understand how and why children and young people have died, in order to identify systems issues that could be modified to prevent future deaths and serious illness or injury.

Data collection

The NZMRDG collects, securely stores and links case information about all child and youth deaths from 1 January 2002 for the CYMRC. Information comes from a variety of sources, including the following:

1. Births, Deaths and Marriages (Department of Internal Affairs)
2. Ministry of Health
3. Oranga Tamariki–Ministry for Children¹
4. coroners
5. Coronial Services (Ministry of Justice)
6. Ministry of Education
7. Water Safety New Zealand
8. Ministry of Transport
9. local child and youth mortality review groups
10. families of the deceased.

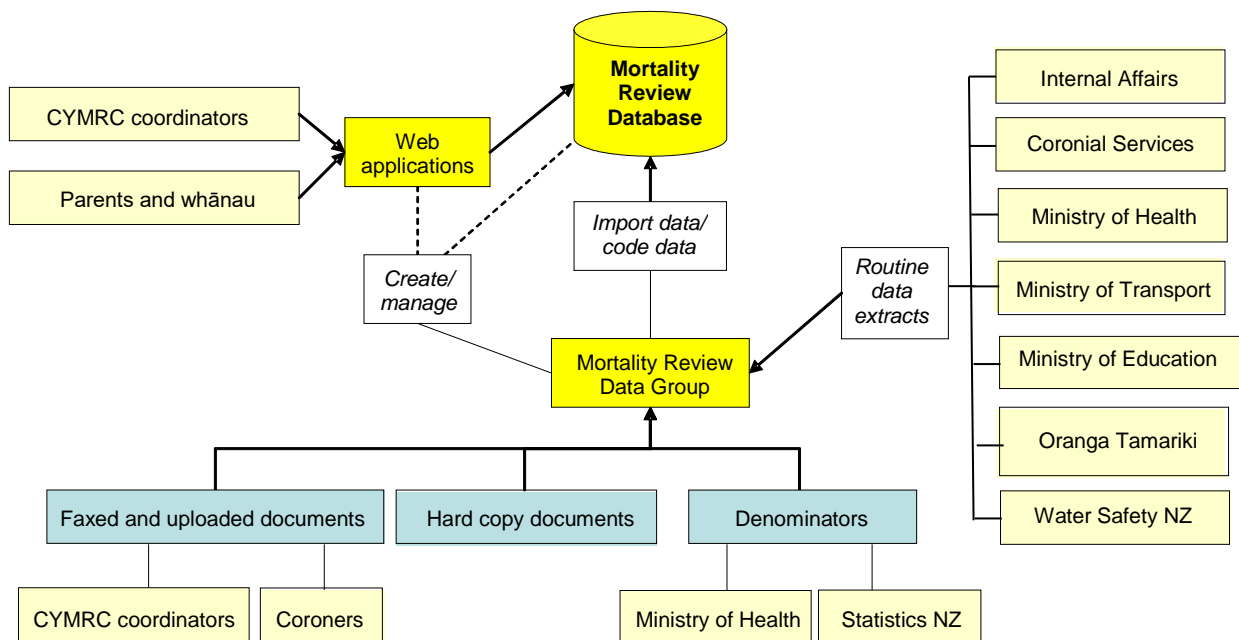
¹ Before 31 March 2017, this was Child, Youth and Family.

Information is provided in varying formats and sent at times and intervals that suit the data provider. A weekly extract from Birth, Deaths and Marriages is the primary source of notification of deaths. Organisations such as Water Safety New Zealand and the Ministry of Health and Ministry of Transport routinely provide selected information on all relevant deaths. Starting in 2018, the Ministry of Education has also been contributing data. The CYMRC continues to consider other suitable data sources in addition to these and to liaise with other organisations.

Some source providers have changed data format or have not been providing information since 2002. For example, Oranga Tamariki–Ministry for Children provides information for cases that it has had contact with from June 2006 onwards. (The age range considered has gradually expanded from infant and preschool to include deaths in children and young people up to 24 years of age in 2009.) Most coroners have provided information on coronial cases since January 2003. The NZMRDG enters and codes all information from the disparate and sometimes conflicting data sources, in order to help facilitate local review as well as national reporting.

Figure M1 outlines the sources of information and some of the processing of this information. The NZMRDG maintains websites that allow individuals to contribute information directly. A link on the public Health Quality & Safety Commission website (www.hqsc.govt.nz/our-programmes/mrc/cymrc/information-for-parents-and-families) allows families, whānau and friends who have lost a child or young person to provide feedback about their experiences. The CYMRC local review group coordinator adds further details both before and after local review, via a secure website. As well as data extracts – directly entered data and coded data – the information system also includes documents faxed by coroners, electronic format coronial case information (post-2010), uploaded documents, hard copies of documents and denominators (provided by Statistics New Zealand and the Ministry of Health).

Figure M1: Flow of case information from sources to the Mortality Review Database



The NZMRDG identifies the National Health Index number, or other relevant identifying information, of the person for whom each item of information is received. It imports data into the Mortality Review Database and links the various sources of information that relate to each individual. Data is

regularly cleaned to eliminate duplicate or incorrect records and to follow up on missing details, so records are complete and internally consistent.

When interpreting CYMRC data, it should be noted it is derived from a database that is constantly being updated. As well as details of new cases, new information and, at times, changing information for existing cases can also be added. As a result, details can change from year to year, even for cases where the death was some years previously. This is particularly true of cases that require an inquest, because this process may sometimes not be completed until years after the death. While this report includes deaths that occurred up until 31 December 2017, the 2017 data is the least complete of any year, for the above reasons. The incompleteness of the data is not randomly spread across all causes. Deaths referred to the coroner, such as unexpected deaths and some injury deaths, are less likely to have final cause of death information available quickly. Therefore, information relating to deaths in 2017, in particular, needs to be interpreted with caution. This also means consecutive annual reports may have slightly different numbers in any one category. The most recent reports will be the most accurate.

Local review process

Deaths of children and young people are reviewed by the local child and youth mortality review group (LCYMRG) in the DHB in which the individual lived. The purpose of local review is to identify systems issues that can be modified to reduce the likelihood of future deaths.

Each LCYMRG has an appointed chair and coordinator, and members from different agencies including health, education, welfare, child protection, corrections, victim support and others. When the death of a child or young person aged between 28 days and 24 years occurs within a coordinator's region, the coordinator will access the secure database to gather initial information on the deceased. The coordinators also collect information from local organisations involved over the life course of the individual, to create a shared understanding of the circumstances leading to a child or young person's death. The coordinator will then initiate information requests to the various members of the LCYMRG, who each act as a representative of their particular organisation. Strict confidentiality requirements apply. Some of the new information gathered as part of the local review process is entered into the Mortality Review Database.

As official agents of the CYMRC, the LCYMRG members can access their organisation's records to identify and collect information that may be relevant to the review process. The members bring this information to the review meeting and provide relevant details, as needed, for the review. Reviews are focused on agency system responses over the life course of the individual. Each review is facilitated by the local chair, whose task it is to bring together all the relevant factors relating to a death.

Information shared in the context of the review meeting must remain confidential to that process. Issues identified in the meeting that require urgent action from participating agencies, such as aspects of professional competence or the safety of others, must be dealt with outside the review process using the normal interagency protocols and procedures. This means participants do not compromise the no-blame focus of the review process or the confidentiality agreement signed as a condition of agent status. The process is exempt from Official Information Act 1982 requirements, but complaints about procedures can be reported to and investigated by the Ombudsman.

A review group might meet several times before all the information has been gathered on a case. Once all the information is complete, local members will consider relevant issues and where systems or service responses could be improved. Both local- and national-level recommendations might be made. Local recommendations are delegated to the relevant member who can champion

their organisation's practice or policy change, which may include community-based solutions. It is important the issues and recommendations are presented in a way that does not assign blame but focuses on system changes that could prevent future deaths.

Once a local death review is completed, the coordinator enters all the relevant data into the secure national database. In this way, issues, recommendations and follow-up actions are forwarded to the CYMRC.

The LCYMRG process allows high levels of detail about the context of death to be obtained. The process itself supports learning from cases to be acted upon locally. Although only a proportion of deaths before 2009 have been reviewed, the increased coverage of the LCYMRGs will allow for many more system improvements.

Analysis and coding

Mortality data

The data used for this report is from the Mortality Review Database and was extracted on 9 September 2018. For the purposes of mortality review in Aotearoa/New Zealand, children and young people are defined as those aged between 28 days and 24 years. In all tables, the year of death relates to the calendar year in which the individual died, rather than the year the death was registered. This is different from some official collections, where the year the death is registered is used. Where neonatal deaths are included, these do not include stillbirths or terminations.

Cause of death

In response to requests for more detailed ICD-10-AM coding, the data received from the Ministry of Health was changed in 2008 to include its mortality coding. Cause of death is now assigned using the underlying cause of death from the Ministry of Health's Mortality Collection. This was backdated to include all cases in the database, not just those from 2008 onwards.

For deaths in infants less than one year of age, sudden unexpected death in infancy (SUDI) is assigned as the cause of death where any one of the following ICD-10-AM codes were listed as the underlying cause of death in the Mortality Collection:

- R95 Sudden infant death syndrome
- R96 Other sudden death, cause unknown
- R98 Unattended death
- R99 Other ill-defined and unspecified causes of mortality
- W75 Accidental suffocation and strangulation in bed
- W78 Inhalation of gastric contents
- W79 Inhalation and ingestion of food causing obstruction of respiratory tract.

If the individual was between 12 months and 23 months of age, and any of the following ICD-10-AM codes were listed as their underlying cause of death, the individual's cause of death was attributed to sudden unexpected death (SUD):

- R95 Sudden infant death syndrome
- R96 Other sudden death, cause unknown
- R98 Unattended death
- R99 Other ill-defined and unspecified causes of mortality
- W75 Accidental suffocation and strangulation in bed
- W78 Inhalation of gastric contents.

The external causes of death, as presented in the cause of death tables, are arranged according to the International Collaborative Effort on Injury Statistics classification. This assigns ICD-10 groupings to various headings. The classification system in this report has been used since 2011 and is slightly different from the years before 2011; hence data from some previous reports may not match exactly.

Ethnicity

Multiple sources of ethnicity data are available in the database. These are: Births, Deaths and Marriages, the Ministry of Health, coronial records and the information entered by LCYMRG coordinators when reviewing a death. A hierarchy (the order above) determines which data source is used, based on evidence as to its quality and completeness in Aotearoa/New Zealand.

Prioritised ethnic categories are used in the main body of the report. Where an individual identifies with more than one ethnic group, prioritised ethnicity assigns one ethnic group to each individual, giving precedence to Māori, followed by Pacific, Asian, MELAA (Middle Eastern Latin American and African) then Other and European ethnicities. Therefore, 'prioritised Māori' is the same as 'total Māori'. However, in the Pacific chapter, a total response ethnicity classification is used. This means, if an individual has a Pacific ethnic group as any one of their ethnicities, they will be included there. Under a prioritised system, if an individual is identified as being both Pacific and Māori, they would be counted as Māori. However, in the Pacific chapter, using a total response system, they will be included as Pacific.

Using prioritised ethnic groupings is in keeping with standard health practice and enables the calculation of rates from population data. However, it is recognised that the ethnic groups used are heterogeneous, and much diversity exists within the groups. Prioritising Māori ethnicity above others means some may not have their preferred ethnicity option.

DHB of residence

The DHB of residence is derived from the person's address as supplied from the coroner, police or Births, Deaths and Marriages. This is based on the individual's self-identified 'usual' place of residence and does not necessarily reflect their legal residential status.

Statistics

The data presented in this report was computed from the Mortality Review Database by the NZMRDG. Percentages are expressed to one decimal point. In some cases, due to rounding, percentages do not sum to 100 exactly.

The denominators used in the main analyses are from two sources. The first is the number of live births in Aotearoa/New Zealand, as supplied by the Ministry of Health. Year is determined using the year of registration of birth, rather than the year of birth itself. Rates for infant deaths are expressed as per 1,000 live births. The birth registration set for 2017 was not available at the time of writing. To estimate the 2017 births, linear extrapolation between 2015 and 2016 was used. The other denominator used is a derived estimated resident population. This is calculated for each year and is based on the Statistics New Zealand estimated resident population from census years 2006 and 2013. Linear extrapolation was undertaken to calculate the estimated resident population between 2006 and 2017. The denominator for the age group of one to four years was calculated using the above linear extrapolation methods to derive the population aged under four years. The number of live births from each year was subtracted from this total to compute the denominator for the age group of one to four years. Rates in this report are presented as per 100,000 age-specific

population for most age groups, except for infants less than one year of age, where rates are expressed as per thousand live births.

Some figures in this document contain historical data dating back to 1980. The numerator for these deaths is as follows: CYMRC data is used for deaths aged 28 days to 24 years from 2002 onwards; before this, Statistics New Zealand data is used. For neonatal deaths (0–27 days), Perinatal and Maternal Mortality Review Committee data is used from 2007 onwards; before this, Statistics New Zealand data is used. The denominator used to calculate infant mortality rates was live births from Statistics New Zealand (1980–2016). The denominators used to calculate mortality rates for children and young people aged 1–24 years were population estimates from Statistics New Zealand (1980–2016). Statistics New Zealand uses a historical de facto population for years before 1991, and, from 1991, the estimated resident population is used. The historical de facto population estimates are based on counts of all people present at a given time and do not account for those who are not usually resident, or who are usually resident but temporarily out of the country.² The estimated resident population takes into account residents who are temporarily overseas and makes an adjustment for net census undercount, as well as excluding visitors from overseas.³ Rates and confidence intervals are expressed to two decimal places. Rates are not calculated for numbers less than three. Due to the differences in the way rates are calculated, and the different denominators used, variations may occur between the rates presented in this report and other published rates.

Numbers are suppressed in cells that have only one or two cases, and, instead of a value, '<3' is entered in the cell. To protect sensitive cells with low values, where required, a technique called 'perturbation' has been used. This involves adding a small amount of 'noise' to the data at the individual level in a way that does not bias the table but allows it to contain as much information as possible while providing protection to sensitive cells.⁴ **In some instances, this results in columns or rows that add up to greater than the total.**

The deaths of non-New Zealand residents are excluded from the main sections of the report because the denominator in the rate calculations (as above) excludes visitors from overseas. Data on this population is provided as a supplement, with rates not calculated.

Notes on interpretation

The term 'statistical significance' in this report indicates a statistical test has provided sufficient evidence that the groups being compared are different (with a statistical significance level of 0.05, that is, the probability that the groups are the same is less than 5 percent).

For figures, bars that have non-overlapping 95 percent confidence intervals can reasonably be considered to be statistically different. However, the converse is not necessarily true. Where confidence intervals do overlap, a statistical test of the rate ratio between the two factors in question has been undertaken. Where this indicates a statistically significant difference, this is shown in a footnote.

² Statistics New Zealand. Historical de facto population estimates. URL: <http://datainfolplus.stats.govt.nz/item/nz.govt.stats/hec27cc6-c9e2-4b7a-b1f4-cb5e096f91ad> (accessed 30 November 2015).

³ Statistics New Zealand. Population concepts. URL: <http://datainfolplus.stats.govt.nz/Item/nz.govt.stats/7751f101-7b2d-4e97-a487-3ac4126d22d4> (accessed 30 November 2015).

⁴ Statistics New Zealand. Introducing new method for confidentialising business demography tables. URL: http://archive.stats.govt.nz/browse_for_stats/businesses/business_characteristics/new-method-for-confidentialising-tables.aspx (accessed 17 February 2019).

1. Aotearoa/New Zealand national data overview | Te tirohanga whānui ki ngā rarauranga ā-motu mō Aotearoa

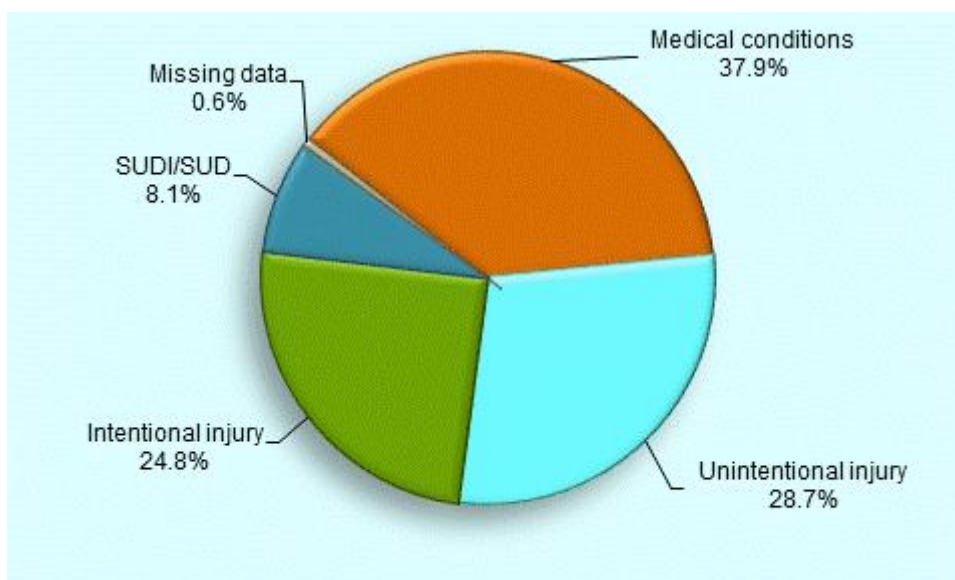
This chapter provides an overview of mortality in children and young people by age, year and cause of death.

Key findings

- In 2017, there were 536 deaths in children and young people.
- Medical conditions were the leading category of death, followed by unintentional injury (predominantly transport related).
- By individual cause of death, over the past five years, the most deaths were from suicide (n=577), followed by transport incidents (n=481), cancers (n=238) and sudden unexpected death in infancy (SUDI) (n=195).
- Mortality is not evenly distributed in the population, with rates higher in Māori and Pacific children and young people, compared with those in other ethnic groups.
- Mortality rates were highest in areas of high deprivation, with those in the New Zealand Deprivation Index decile 10 being 2.5 times more likely to die than those in decile 1.

In Aotearoa/New Zealand, during the period 2013–17, 2,556 children and young people aged 28 days to 24 years died (**Table 1.1**). Overall, the leading cause of death was medical conditions (37.9 percent). This was followed by unintentional injury (28.7 percent of deaths) and intentional injury (24.8 percent) deaths. Sudden unexpected death, either in infancy (SUDI) or in those aged 12–23 months of age (SUD), accounted for 8.1 percent of deaths (**Figure 1.1**).

Figure 1.1: Mortality (%) in children and young people aged 28 days to 24 years by cause of death, Aotearoa/New Zealand 2013–17 (n=2,556 deaths)



Source: Mortality Review Database.

The leading category of death changes with age, with medical conditions being the most common cause of death in children aged younger than 15 years, and intentional injury (suicide and assault) being the predominant cause in those aged 15–24 years (**Table 1.1**).

Table 1.1: Mortality (number of deaths) in children and young people aged 28 days to 24 years by cause of death and age group, Aotearoa/New Zealand 2013–17 combined (n=2,556 deaths)

Category	<1 year*	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total	Percentage (%)
Medical	228	152	105	73	174	236	968	37.9
Unintentional injury	11	71	51	47	236	317	733	28.7
Intentional injury	8	10	3	37	248	327	633	24.8
SUDI/SUD	195	11	0	0	0	0	206	8.1
Missing data	<3	<3	<3	<3	3	6	16	0.6
Total	444	246	161	158	661	886	2,556	100

* This category represents infants 28 days and older, and less than one calendar year in age.

Source: Mortality Review Database.

The leading medical causes of death also change with age. Perinatal conditions and congenital anomalies predominate in the first year of life, followed by diseases of the circulatory system and infectious and parasitic diseases. However, from one year of age onwards, cancers are the primary medical cause of death. In adolescents, diseases of the nervous system are also prevalent. This includes deaths due to epilepsy (51 percent of adolescent neurological deaths), cerebral palsy and muscular dystrophy (21 percent each).

Unintentional injury deaths in children and young people occurred in two peaks: the first in children aged under five years, where proportionally there was a high number of drownings, and the second in adolescence. The number of deaths in preschoolers due to drowning in home swimming pools has risen. In 2017 there were five deaths in the age group one to four years. Over the preceding 15-year period, there was an average of just over two deaths per year. Transport injuries feature heavily in unintentional injury deaths.

From 10 years of age onwards, suicide deaths predominate and are the single most common cause of death. Deaths due to assault also occur in two peaks: the first in children under the age of five years and the second in adolescence (**Table 1.2**).

Table 1.2: Mortality (number of deaths and rate per 100,000 population) by cause of death and age group, Aotearoa/New Zealand 2013–17 combined (n=2,556 deaths)

Cause of death	<1 year*	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total	%	Rate 2013–17
Medical									
Infectious and parasitic disease	20	16	3	<3	6	<3	48	1.9	0.62
Neoplasms	11	30	41	26	64	66	238	9.3	3.07
Diseases of the blood and blood-forming organs and disorders of the immune system	6	<3	<3	0	5	<3	16	0.6	0.21
Endocrine, nutritional and metabolic diseases	7	6	8	4	10	12	47	1.8	0.61
Mental and behavioural disorders	0	<3	<3	<3	3	8	13	0.5	0.17
Diseases of the nervous system	12	29	12	10	27	45	135	5.3	1.74
Diseases of the ear and mastoid process	<3	<3	0	0	0	0	<3	x	s
Diseases of the circulatory system	21	9	4	10	18	31	93	3.6	1.2
Diseases of the respiratory system	17	20	11	13	8	10	79	3.1	1.02
Diseases of the digestive system	4	<3	<3	<3	<3	4	16	0.6	0.21
Diseases of the skin and subcutaneous tissue	0	0	0	0	0	<3	<3	x	s
Diseases of the musculoskeletal system and connective tissue	<3	<3	0	<3	<3	<3	6	0.2	0.08
Diseases of the genitourinary system	0	0	<3	0	<3	6	7	0.3	0.09
Pregnancy, childbirth and the puerperium	0	0	0	0	0	5	5	0.2	0.06
Certain conditions originating in the perinatal period	61	<3	<3	0	0	0	63	2.5	0.81
Congenital anomalies	68	30	19	3	19	21	160	6.3	2.07
Symptoms and abnormal findings not elsewhere classified	0	7	<3	<3	10	21	40	1.6	0.52
Total medical	228	152	105	73	174	236	968	37.9	12.5

Cause of death	<1 year*	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total	%	Rate 2013–17
Unintentional injury#									
Cut/pierce	0	0	0	<3	<3	<3	<3	x	s
Drowning	<3	21	6	6	25	38	98	3.8	1.27
Fall	<3	3	<3	<3	7	12	26	1	0.34
Fire/hot object or substance	<3	<3	4	<3	5	3	15	0.6	0.19
Firearm	0	0	<3	<3	<3	5	9	0.4	0.12
Machinery	0	<3	0	0	<3	3	6	0.2	0.08
Transport	6	29	30	26	172	218	481	18.8	6.21
Natural/environmental	0	3	<3	<3	0	<3	7	0.3	0.09
Poisoning	0	<3	<3	<3	12	17	34	1.3	0.44
Struck by, against	0	3	<3	<3	3	5	12	0.5	0.15
Suffocation	0	5	5	3	4	8	25	1	0.32
Other specified, classifiable	<3	0	<3	<3	<3	4	10	0.4	0.13
Other specified, not elsewhere classified	0	0	0	<3	<3	<3	<3	x	s
Unspecified	<3	3	0	<3	0	<3	5	0.2	0.06
Sequelae of surgical and medical care as external cause	0	0	0	<3	<3	0	<3	x	s
Total unintentional injury	11	71	51	47	236	317	733	28.7	9.47
Intentional injury									
Assault	8	10	3	<3	9	25	56	2.2	0.72
Suicide	0	0	0	36	239	302	577	22.6	7.45
Total intentional injury	8	10	3	37	248	327	633	24.8	8.18
SUDI/SUD									
SUDI (28 days to <1 year)†	195	0	0	0	0	0	195	7.6	2.52
SUD (12–23 months)‡	0	11	0	0	0	0	11	0.4	0.14
Total SUDI/SUD	195	11	0	0	0	0	206	8.1	2.66
Missing data	<3	<3	<3	<3	3	6	16	0.63	0.21
Total	444	246	161	158	661	886	2,556	100	33.01

'x' indicates percent not calculated due to small numbers.

's' indicates rate not calculated due to small numbers.

* This category represents infants 28 days and older, and less than one calendar year in age.

Includes unintentional, undetermined intent and legal intervention or war.

† See **Table 7.1** for SUDI deaths by ICD-10-AM code.

‡ See **Table 8.1** for SUD deaths by ICD-10-AM code.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 0–24 years.

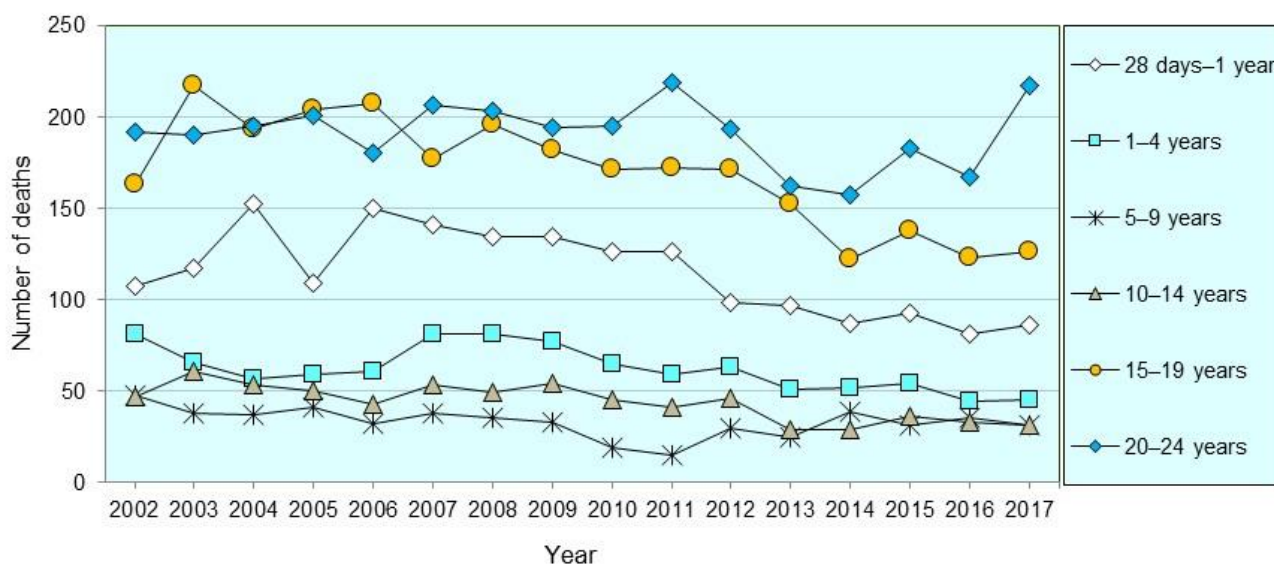
There has not been a consistent trend in the number of deaths per year over the past five years. While there were some increases in the number of deaths in many age groups in 2017, this was most marked in adolescents aged 20–24 years (**Table 1.3** and **Figure 1.2**). Among deaths in the group aged 20–24 years, the largest increases from previous years were in medical deaths (predominantly diseases of the circulatory system and 'unspecified' causes) and in transport deaths. For transport deaths, the largest increase in deaths was in car occupants, followed by those in pickup trucks and vans.

Table 1.3: Mortality (number of deaths) in children and young people aged 28 days to 24 years by age group and year of death, Aotearoa/New Zealand 2013–17 (n=2,556 deaths)

Category	2013	2014	2015	2016	2017	Total	Percentage (%)
28 days–<1 year	97	87	93	81	86	444	17.4
1–4 years	51	52	54	44	45	246	9.6
5–9 years	25	39	31	35	31	161	6.3
10–14 years	29	29	36	33	31	158	6.2
15–19 years	152	122	138	123	126	661	25.9
20–24 years	162	157	183	167	217	886	34.7
Total	516	486	535	483	536	2,556	100

Source: Mortality Review Database.

Figure 1.2: Mortality (number of deaths) in children and young people aged 28 days to 24 years by age group and year of death, Aotearoa/New Zealand 2002–17 (n=9,829 deaths)



Source: Mortality Review Database.

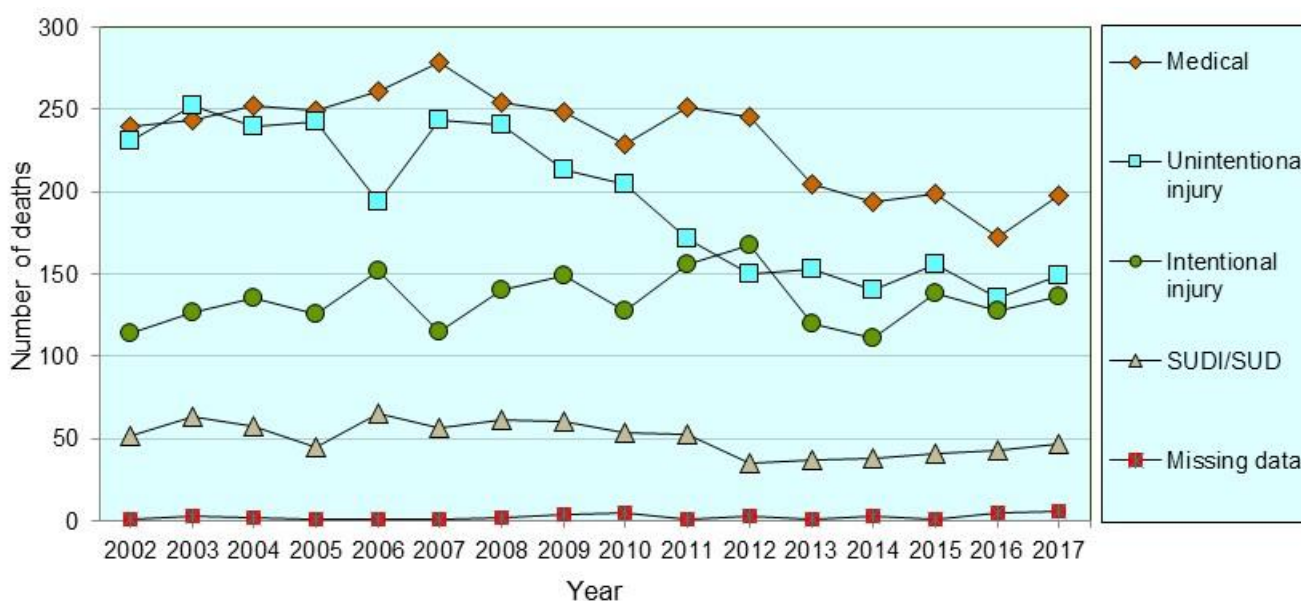
Table 1.4: Mortality (number of deaths) in children and young people aged 28 days to 24 years by cause and year of death, Aotearoa/New Zealand 2013–17 (n=2,556 deaths)

Category	2013	2014	2015	2016	2017	Total	Percentage (%)
Medical	205	194	199	172	198	968	37.9
Unintentional injury	153	140	156	135	149	733	28.7
Intentional injury	120	111	138	128	136	633	24.8
SUDI/SUD	37	38	41	43	47	206	8.1
Missing data	<3	3	<3	5	6	16	0.6
Total	516	486	535	483	536	2,556	100

Source: Mortality Review Database.

Similarly, there has been a small increase in the number of deaths for all causes of death in 2017, compared with the previous five years. However, deaths due to medical causes and unintentional injuries are gradually reducing over time, while those due to intentional injuries and SUDI/SUD are not (Table 1.4) and (Figure 1.3).

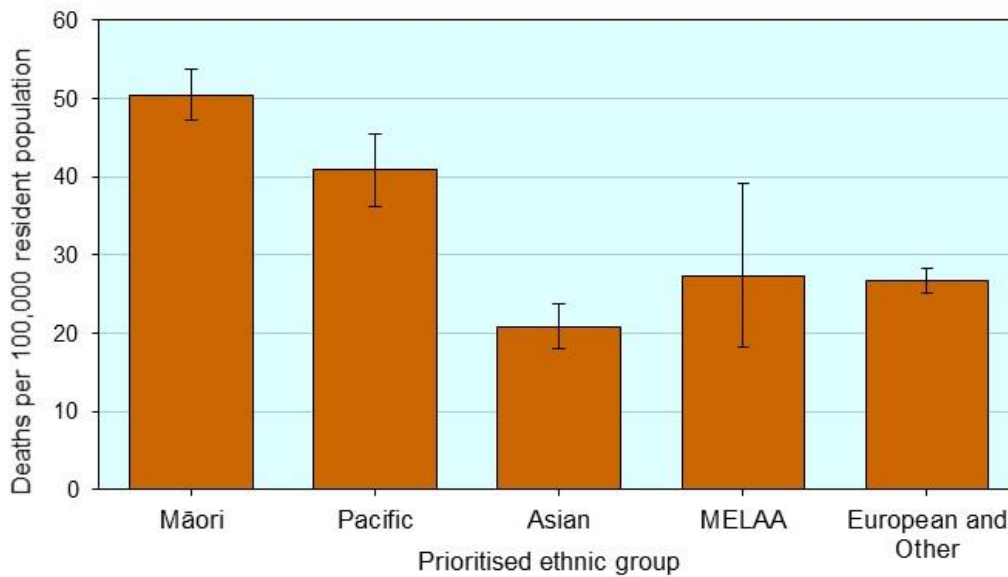
Figure 1.3: Mortality (number of deaths) in children and young people aged 28 days to 24 years by cause and year of death, Aotearoa/New Zealand 2002–17 (n=9,829 deaths)



Source: Mortality Review Database.

When examined by prioritised ethnic group, tamariki and rangatahi Māori and Pacific children and young people had the highest mortality rates, followed by MELAA and those of European and Other ethnicities. Asian children and young people had the lowest mortality rate overall (Figure 1.4).

Figure 1.4: Mortality (rates per 100,000 population and 95 percent confidence intervals) in children and young people aged 28 days to 24 years by prioritised ethnic group, Aotearoa/New Zealand 2013–17 combined (n=2,552 deaths*)



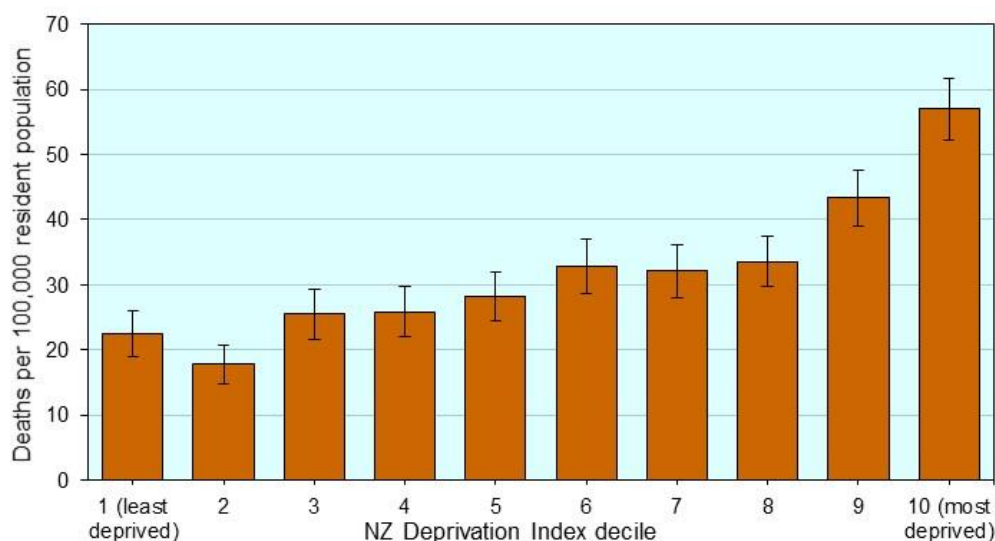
* Excludes four cases with no available ethnicity data.

MELAA = Middle Eastern Latin American and African.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 0–24 years.

Mortality rates vary by deprivation, as measured by the New Zealand Deprivation Index. For children and young people, overall, a consistent pattern was evident of higher mortality rates with increasing deprivation. Of note, those in decile 10 (most deprived) had a mortality rate 2.5 times higher than those in decile 1 (least deprived) (**Figure 1.5**).

Figure 1.5: Mortality (rates per 100,000 population and 95 percent confidence intervals) in children and young people aged 28 days to 24 years by NZ Deprivation Index decile, Aotearoa/New Zealand 2013–17 combined (n=2,550 deaths*)



* Excludes six cases with no available deprivation data.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 0–24 years.

2. Māori mortality | Te takimate a Ngāi Māori

This chapter examines mortality in tamariki and rangatahi Māori. Non-Māori non-Pacific children and young people are used as the comparator group. The use of a comparator group in this instance is not to describe the deficits of a group but to highlight the deficits of a society that tolerates these inequities. The analyses in this chapter exclude Pacific children and young people (n=296) and those for whom their ethnicity is unknown or not recorded (n=4). This chapter reports on deaths that occurred in Aotearoa/New Zealand during the years 2013–17.

Key findings

- During the five-year period 2013–17, there were 931 deaths in tamariki and rangatahi Māori.
- When comparing 2016 with 2017, the overall number of deaths in 2017 was greater, with 182 deaths in 2016 and 208 in 2017.
- The leading categories of death were medical conditions (32.1 percent) followed by intentional injury (predominantly suicide), with 28.7 percent of deaths. The most common medical condition causing death was neoplasms.
- Large inequities remain in mortality rates for tamariki and rangatahi Māori, compared with non-Māori non-Pacific children and young people. This is most notable for SUDI, where the rate ratio comparing Māori with non-Māori non-Pacific is 8.41 (95 percent confidence interval (CI) 5.90–11.97), and for intentional injury deaths, where the rate ratio is 2.35 (95 percent CI 2.00–2.77).
- Eighty-nine percent of intentional injury deaths were due to suicide, with marked inequities in the suicide rate between Māori and non-Māori non-Pacific occurring from the age of 10 years upwards. The CYMRC and Suicide Mortality Review Committee, together with Ngā Pou Arawhenua, are currently investigating this marked inequity in suicide rates, particularly examining the structural influences that place rangatahi at risk of suicide. The findings will be published late 2019.
- Given the disproportionate impact of deprivation in Māori mortality, significant progress needs to be made in reducing poverty to reduce inequities.

During 2013–17, there were 931 deaths in tamariki and rangatahi Māori. The overall leading cause of death for all ages was medical conditions (32.1 percent). The four leading causes of medical death were: neoplasms (n=69); congenital anomalies (n=43); diseases of the circulatory system (n=35); and diseases of the nervous system (n=34), which includes deaths due to epilepsy and cerebral palsy. The next most common cause of death was intentional injury (28.7 percent), which includes suicide and assault deaths. For the same period, there were 236 deaths due to unintentional injury (25.3 percent) and 123 deaths due to SUDI (<1 year) and SUD (12–23 months) (13.2 percent). Overall, tamariki and rangatahi Māori had higher mortality rates, compared with non-Māori non-Pacific. This was most notable for SUDI/SUD deaths (rate ratio 8.44, 95 percent CI 5.93–12.02) and intentional deaths (rate ratio 2.36, 95 percent CI 2.01–2.78) (**Table 2.1**). The total number of deaths fluctuates from year to year (**Table 2.2**).

Table 2.1: Mortality (number of deaths and rates per 100,000 population) in tamariki and rangatahi Māori aged 28 days to 24 years by cause of death and age group, compared with non-Māori non-Pacific children and young people, Aotearoa/New Zealand 2013–17 combined (n=2,256 deaths)

Category	Māori						Total		Rate		Rate ratio (95% CI)
	<1 year*	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
Medical	88	48	30	19	49	65	299	524	16.2	10.13	1.60 (1.39–1.84)
Unintentional injury	<3	24	20	21	82	87	236	438	12.79	8.47	1.51 (1.29–1.77)
Intentional injury	6	6	0	19	114	122	267	318	14.47	6.15	2.35 (2.00–2.77)
SUDI/SUD	116	7	0	0	0	0	123	41	6.66	0.79	8.41 (5.90–11.97)
Missing data	<3	<3	0	<3	<3	<3	6	4	0.33	0.08	4.20 (1.19–14.89)
Total	214	86	50	60	246	275	931	1,325	50.44	25.62	1.97 (1.81–2.14)

* This category represents infants 28 days and older, and less than one calendar year in age.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 0–24 years.

Table 2.2: Mortality (number of deaths and rates per 100,000 population) in tamariki and rangatahi Māori aged 28 days to 24 years by cause and year of death, compared with non-Māori non-Pacific children and young people, Aotearoa/New Zealand 2013–17 (n=2,256 deaths)

Category	Māori					Total		Rate		Rate ratio (95% CI)
	2013	2014	2015	2016	2017	Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
Medical	66	57	55	62	59	299	524	16.2	10.13	1.60 (1.39–1.84)
Unintentional injury	55	43	40	39	59	236	438	12.79	8.47	1.51 (1.29–1.77)
Intentional injury	53	42	60	53	59	267	318	14.47	6.15	2.35 (2.00–2.77)
SUDI/SUD	22	28	18	26	29	123	41	6.66	0.79	8.41 (5.90–11.97)
Missing data	0	<3	<3	<3	<3	6	4	0.33	0.08	4.20 (1.19–14.89)
Total	196	171	174	182	208	931	1,325	50.44	25.62	1.97 (1.81–2.14)

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 0–24 years.

Mortality rates varied considerably by age group, with the rate in those aged five to nine years being the lowest (12.69 per 100,000), and the rate in those aged 28 days to one year being the highest (2.50 per 1,000; equivalent to 250 per 100,000). Similarly, inequities between Māori and non-Māori non-Pacific varied considerably by age group. Tamariki Māori aged five to nine years have a similar mortality rate to non-Māori non-Pacific, but pēpe Māori (28 days to under one year) have an all-cause mortality rate 2.9 times higher than non-Māori non-Pacific (rate ratio 2.87, 95 percent CI 2.34–3.53) (**Table 2.3**). Excluding those aged five to nine years, mortality rates for tamariki and rangatahi Māori were statistically significantly higher than those for non-Māori non-Pacific children and young people at every other age group.

Table 2.3: Mortality (number of deaths and rates per 100,000 population) in tamariki and rangatahi Māori aged 28 days to 24 years by age group and year of death, compared with non-Māori non-Pacific children and young people, Aotearoa/New Zealand 2013–17 (n=2,256 deaths)

Age group	Māori					Total		Rate		Rate ratio (95% CI)
	2013	2014	2015	2016	2017	Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
28 days–<1 year*	42	50	36	45	41	214	159	2.50	0.87	2.87 (2.34–3.53)
1–4 years	20	21	16	18	11	86	126	24.54	15.35	1.60 (1.22–2.10)
5–9 years	13	9	3	13	12	50	92	12.69	9.44	1.34 (0.95–1.90)
10–14 years	9	11	11	10	19	60	76	16.65	7.93	2.10 (1.50–2.95)
15–19 years	58	34	57	50	47	246	348	70.61	32.58	2.17 (1.84–2.55)
20–24 years	54	46	51	46	78	275	524	89.57	44.92	1.99 (1.72–2.31)
Total	196	171	174	182	208	931	1,325	50.44	25.62	1.97 (1.81–2.14)

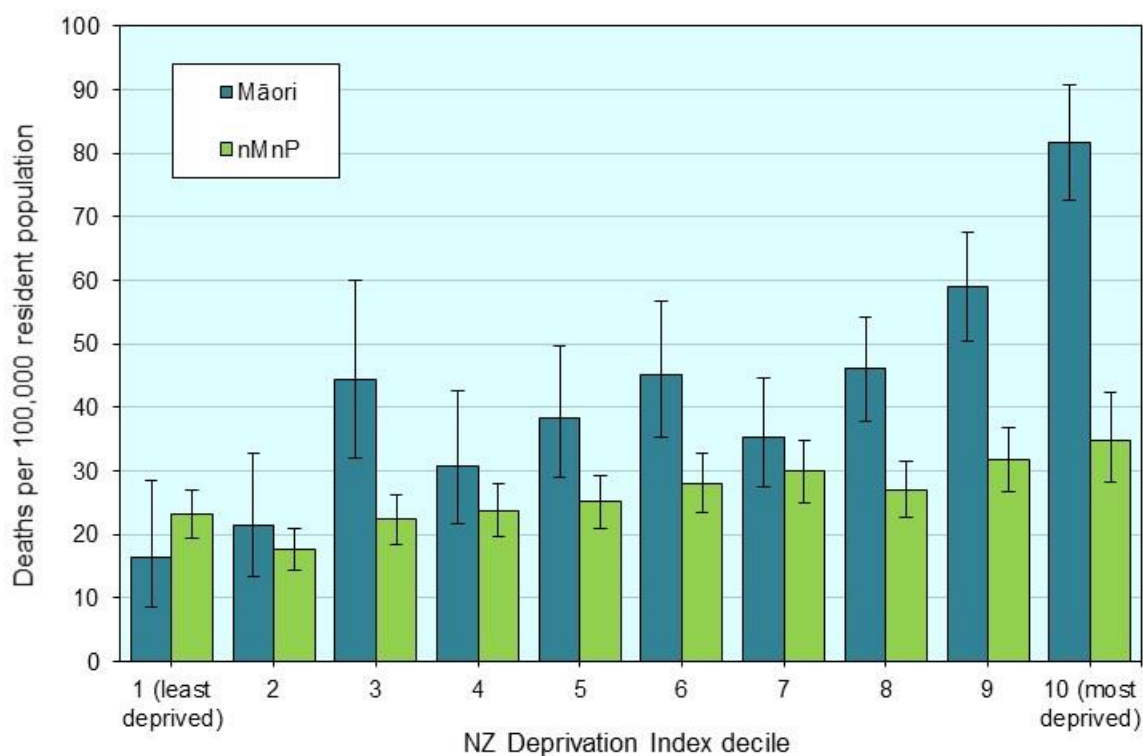
* Note rate is per 1,000 live births.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG age-specific Estimated Resident Population 2013–17, 0–24 years.

Mortality varied significantly by deprivation, as measured by New Zealand Deprivation Index decile. Those living in high-decile areas (most deprived) had significantly higher mortality rates than those in lower-decile areas (least deprived), regardless of ethnic group. However, tamariki and rangatahi Māori had statistically significantly higher mortality rates than non-Māori non-Pacific at most levels of deprivation. Rates were statistically significantly higher in Māori from decile 3 onwards, excluding deciles 4 and 7⁵ (**Figure 2.1**). Given the high proportion of tamariki and rangatahi Māori living in high-decile areas, conditions that are influenced by deprivation will have a disproportionate impact on Māori (see chapter 17, **New Zealand Deprivation Index**).

⁵ The Māori:non-Māori non-Pacific rate ratio for decile 5 is 1.53, 95 percent CI 1.12–2.08.

Figure 2.1: Mortality (rates per 100,000 population and 95 percent confidence intervals) in tamariki and rangatahi Māori aged 28 days to 24 years by NZ Deprivation Index decile, compared with non-Māori non-Pacific children and young people, Aotearoa/New Zealand 2013–17 combined (n=2,250 deaths*)



* Excludes six cases with no available deprivation data.

nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 0–24 years.

Post-neonatal pēpe Māori

During the five-year period 2013–17, there were 214 deaths in pēpe Māori aged 28 days to one year. The most common cause of death was SUDI, with 116 deaths. The next leading cause of death was medical conditions, with 88 deaths. For both SUDI and medical conditions, the mortality rate in Māori was statistically significantly higher than that in non-Māori non-Pacific babies (SUDI rate ratio 6.52, 95 percent CI 4.52–9.40; medical rate ratio 1.69, 95 percent CI 1.28–2.24). There were six deaths due to assault, and fewer than three deaths from unintentional injury (**Table 2.4**).

Table 2.4: Mortality (number of deaths and rates per 1,000 live births) in post-neonatal pēpe Māori by cause and year of death, compared with non-Māori non-Pacific infants, Aotearoa/New Zealand 2013–17 (n=373 deaths)

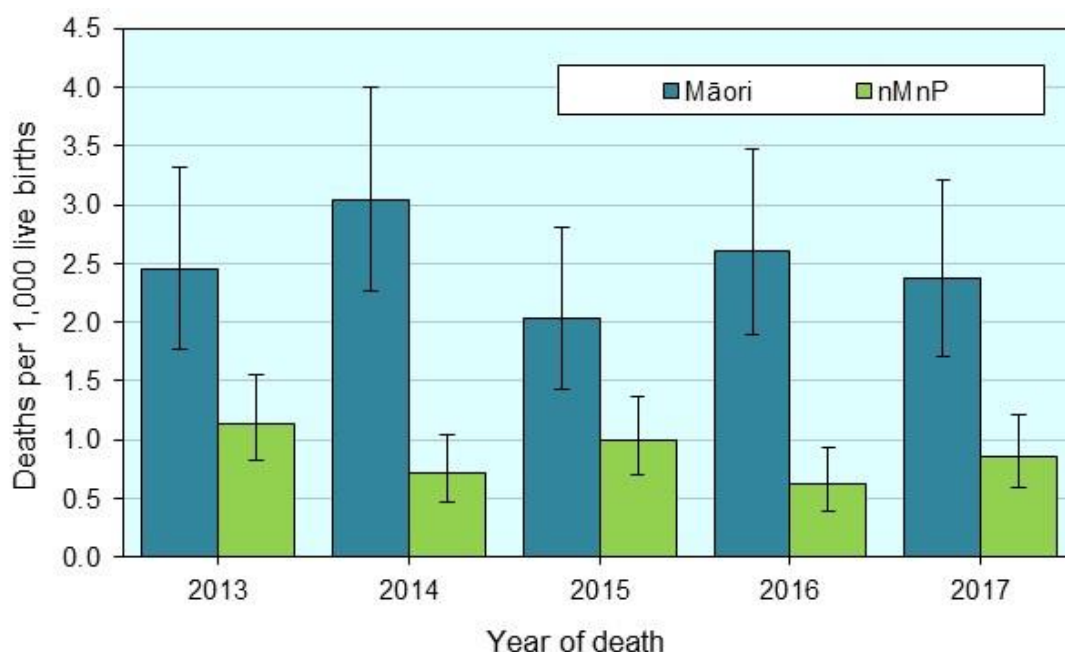
Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
Medical	21	18	17	20	12	88	111	1.03	0.61	1.69 (1.28–2.24)
Unintentional injury	0	<3	0	<3	<3	<3	8	s	0.04	0.53 (0.11–2.51)
Intentional injury	<3	4	<3	<3	0	6	<3	0.07	s	–
SUDI	21	27	18	22	28	116	38	1.36	0.21	6.52 (4.52–9.40)
Missing data	<3	<3	<3	<3	<3	<3	<3	s	s	–
Total	42	50	36	45	41	214	159	2.5	0.87	2.87 (2.34–3.53)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2013–16, NZMRDG 2017.

Since 2012, the mortality rate has fluctuated, with change being largely driven by the number of deaths from SUDI. In 2017, however, there were fewer medical deaths but more deaths from SUDI (**Table 2.4**). For every year, pēpe Māori had a statistically significantly higher mortality rate than non-Māori non-Pacific infants (**Figure 2.2**).

Figure 2.2: Mortality (rates per 1,000 live births and 95 percent confidence intervals) in post-neonatal pēpe Māori by year of death, compared with non-Māori non-Pacific infants, Aotearoa/New Zealand 2013–17 (n=214 Māori and 159 non-Māori non-Pacific deaths)

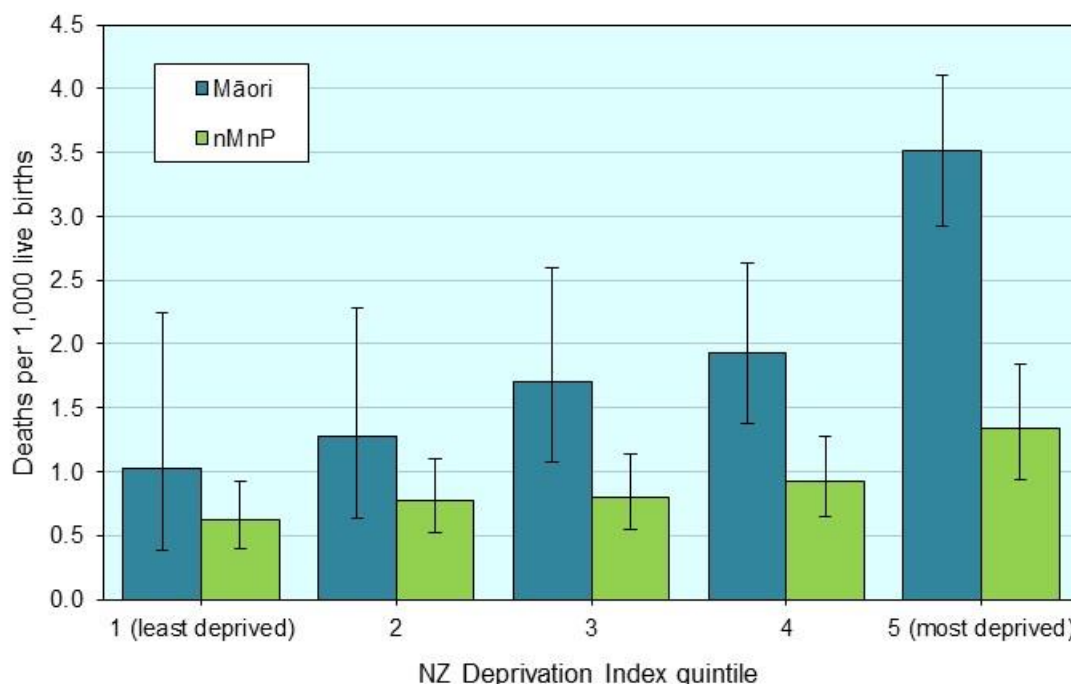


nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2013–16, NZMRDG 2017.

When examining mortality by deprivation, in pēpe Māori, mortality rates were higher in those living in more deprived areas. Pēpe Māori had statistically significantly higher mortality rates than non-Māori non-Pacific infants in quintiles 3 to 5⁶ (**Figure 2.3**).

Figure 2.3: Mortality (rates per 1,000 live births and 95 percent confidence intervals) in post-neonatal pēpe Māori by NZ Deprivation Index quintile, compared with non-Māori non Pacific infants, Aotearoa/New Zealand 2013–17 combined (n=213 Māori and 158 non-Māori non-Pacific deaths*)



* Excludes two cases with no available deprivation data.

nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2013–16, NZMRDG 2017.

Tamariki Māori aged one to four years

During 2013–17, there were 86 deaths in tamariki Māori aged one to four years. Medical conditions were the leading cause (56 percent), followed by unintentional injury (28 percent). Tamariki Māori had a higher rate of SUD (12–23 months) (rate ratio 5.47, 95 percent CI 1.41–21.14) and a higher mortality rate overall (rate ratio 1.60, 95 percent CI 1.22–2.10), compared with non-Māori non-Pacific children (**Table 2.5**).

⁶ The Māori:non-Māori non-Pacific rate ratio for quintile 3 was 2.14, 95 percent CI 1.24–3.70.

Table 2.5: Mortality (number of deaths and rates per 100,000 population) in tamariki Māori aged one to four years by cause and year of death, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 (n=212 deaths)

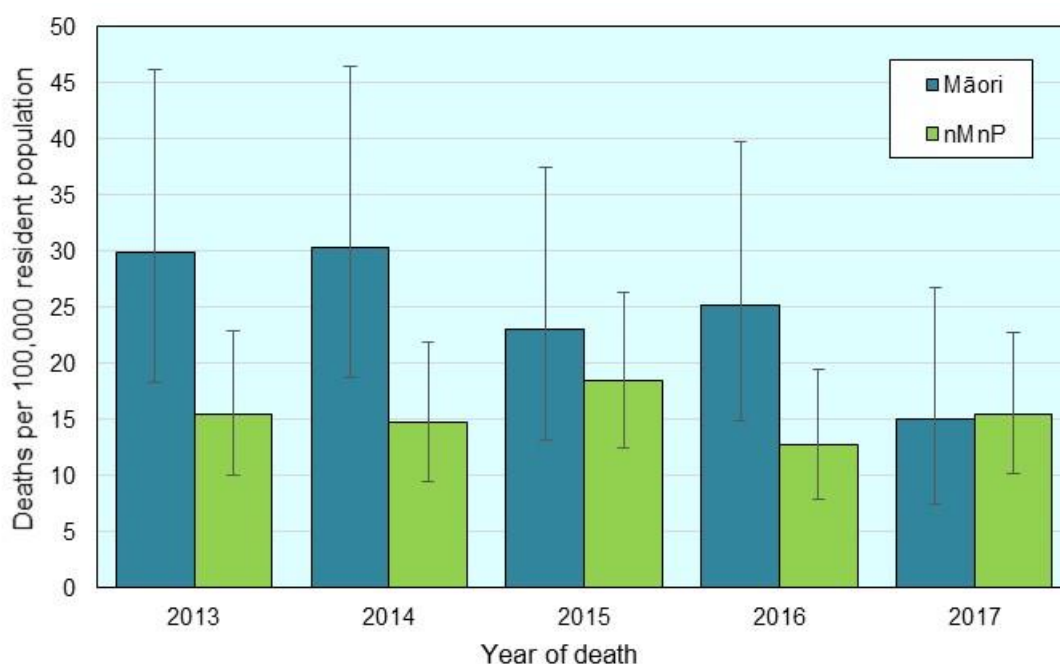
Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
Medical	10	14	9	10	5	48	81	13.70	9.87	1.39 (0.97–1.98)
Unintentional injury	9	6	<3	3	4	24	37	6.85	4.51	1.52 (0.91–2.54)
Intentional injury	0	0	5	<3	0	6	4	1.71	0.49	3.51 (0.99–12.45)
SUD	<3	<3	0	4	<3	7	3	2.00	0.37	5.47 (1.41–21.14)
Missing data	<3	<3	<3	<3	<3	<3	<3	s	s	–
Total	20	21	16	18	11	86	126	24.54	15.35	1.60 (1.22–2.10)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, one to four years.

Mortality in this age group has fluctuated from year to year, with no statistically significant change over the study period for tamariki Māori or non-Māori non-Pacific children (**Figure 2.4**).

Figure 2.4: Mortality (rates per 100,000 population and 95 percent confidence intervals) in tamariki Māori aged one to four years by year of death, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 (n=86 Māori and 126 non-Māori non-Pacific deaths)



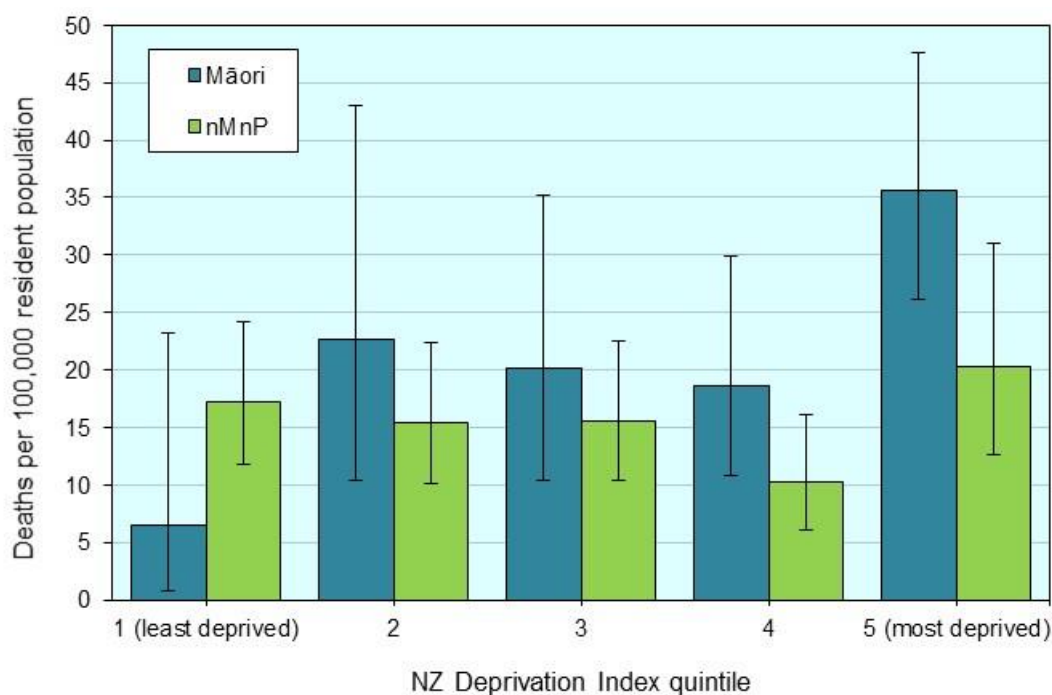
nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, one to four years.

For tamariki Māori aged one to four years, no statistically significant differences were evident between Māori and non-Māori non-Pacific children, except at quintile 5⁷ (**Figure 2.5**).

⁷ The Māori:non-Māori non-Pacific rate ratio for quintile 5 was 1.76, 95 percent CI 1.05–2.94.

Figure 2.5: Mortality (rates per 100,000 population and 95 percent confidence intervals) in tamariki Māori aged one to four years by NZ Deprivation Index quintile, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 combined (n=86 Māori and 126 non-Māori non-Pacific deaths)



nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, one to four years.

Tamariki Māori aged five to nine years

In children aged five to nine years, there were 50 deaths in tamariki Māori during 2013–17. The leading causes of death were medical conditions (60 percent) and unintentional injury (40 percent). No statistically significant differences could be seen between the mortality rates in tamariki Māori and non-Māori non-Pacific children. There were no deaths in tamariki Māori by intentional injury (**Table 2.6**).

Table 2.6: Mortality (number of deaths and rates per 100,000 population) in tamariki Māori aged five to nine years by cause and year of death, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 (n=142 deaths)

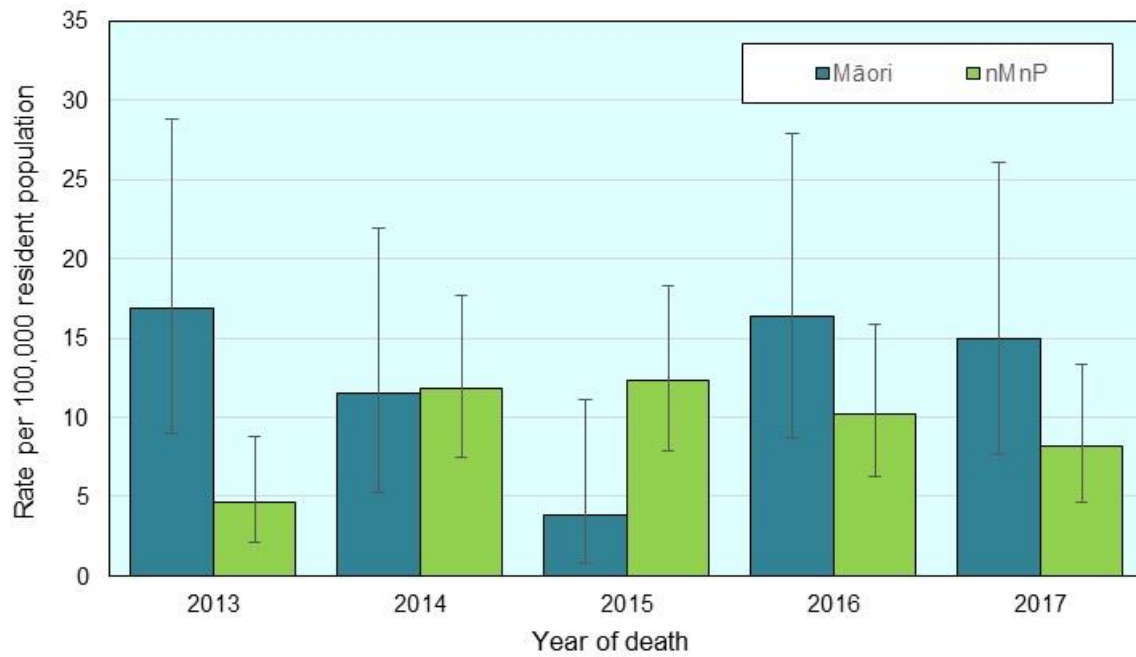
Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
Medical	9	3	<3	9	7	30	60	7.61	6.15	1.24 (0.8–1.92)
Unintentional injury	4	5	<3	4	5	20	29	5.07	2.97	1.71 (0.97–3.02)
Intentional injury	0	0	0	0	0	0	3	0	0.31	–
Missing data	0	<3	0	0	0	<3	0	s	0	–
Total	13	9	3	13	12	50	92	12.69	9.44	1.34 (0.95–1.9)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, five to nine years.

Mortality rates varied substantially over the five-year period, but no consistent statistically significant differences were evident in mortality rates between the years or between tamariki Māori and non-Māori non-Pacific children (**Figure 2.6**).

Figure 2.6: Mortality (rates per 100,000 population and 95 percent confidence intervals) in tamariki Māori aged five to nine years by year of death, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 (n=50 Māori and 92 non-Māori non-Pacific deaths)

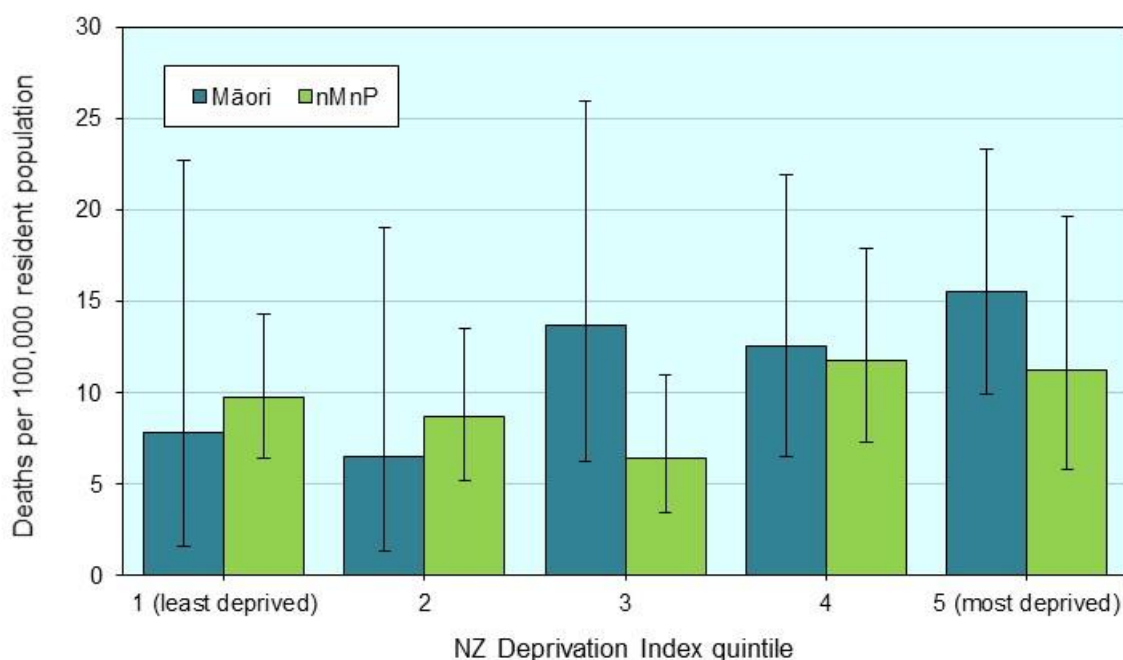


nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, five to nine years.

When examined by New Zealand Deprivation Index quintile, there were no statistically significant differences in mortality rates either by deprivation quintile or between tamariki Māori and non-Māori non-Pacific children (**Figure 2.7**).

Figure 2.7: Mortality (rates per 100,000 population and 95 percent confidence intervals) in tamariki Māori aged five to nine years by New Zealand Deprivation Index quintile, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 combined (n=50 Māori and 91 non-Māori non-Pacific deaths*)



* Excludes one case with no available deprivation data.

nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, five to nine years.

Tamariki Māori aged 10–14 years

During the 2013–17 period, 60 tamariki Māori aged 10–14 years died, with an overall mortality rate of 16.7 per 100,000, which was statistically significantly higher than the mortality rate for non-Māori non-Pacific children of the same age (rate ratio 2.10, 95 percent CI 1.50–2.95). The leading cause of death was unintentional injury (35 percent), with medical conditions and intentional injury accounting for 32 percent each. Of the intentional injury deaths in tamariki Māori in this age group, all were due to suicide; there were no deaths due to assault. Compared with non-Māori non-Pacific children, Māori had statistically higher mortality rates of unintentional and intentional injury (rate ratios 2.54, 95 percent CI 1.40–4.62 and 3.89, 95 percent CI 1.92–7.87, respectively), as well as a higher mortality rate overall (**Table 2.7**).

Table 2.7: Mortality (number of deaths and rates per 100,000 population) in tamariki Māori aged 10–14 years by cause and year of death, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 (n=136 deaths)

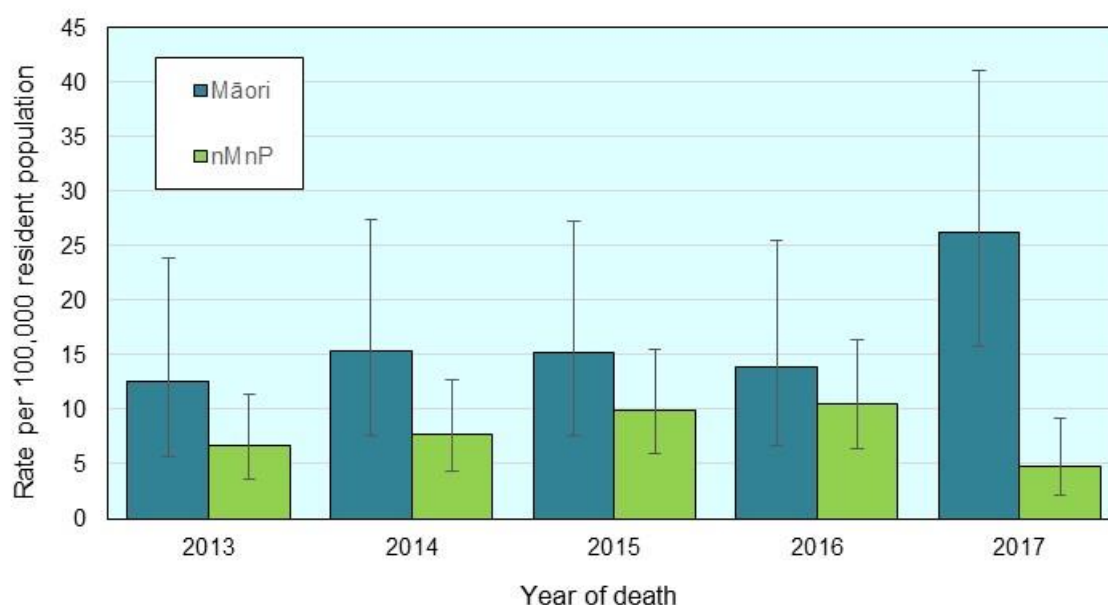
Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
Medical	3	3	5	3	5	19	41	5.27	4.28	1.23 (0.72–2.12)
Unintentional injury	5	4	<3	4	7	21	22	5.83	2.29	2.54 (1.40–4.62)
Intentional injury	<3	<3	4	4	7	19	13	5.27	1.36	3.89 (1.92–7.87)
Missing data	<3	<3	<3	<3	0	<3	0	s	0	–
Total	9	11	11	10	19	60	76	16.65	7.93	2.10 (1.50–2.95)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 10–14 years.

When examined by year, there were no consistent trends over the time period in either rates by year, or comparisons between tamariki Māori and non-Māori non-Pacific children (**Figure 2.8**).

Figure 2.8: Mortality (rates per 100,000 population and 95 percent confidence intervals) in tamariki Māori aged 10–14 years by year of death, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 (n=60 Māori and 76 non-Māori non-Pacific deaths)



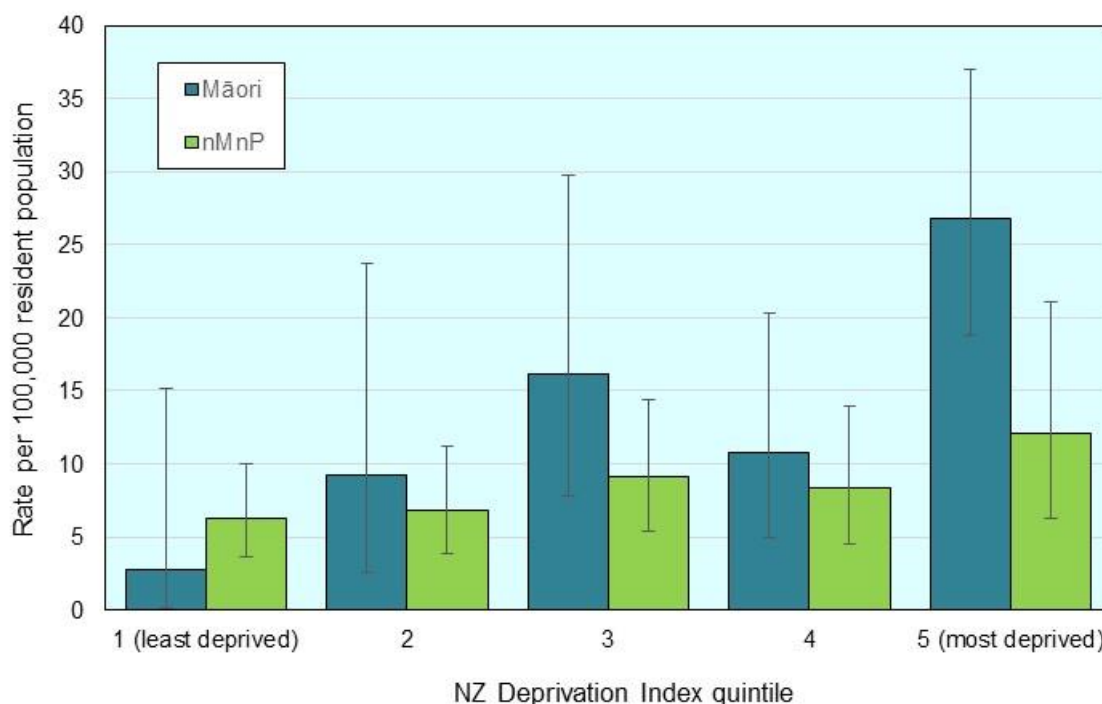
nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 10–14 years.

Mortality rates varied somewhat by deprivation, with a pattern of higher mortality rates in the most deprived areas. There was a statistically significantly higher mortality rate in tamariki Māori, compared with non-Māori non-Pacific children in quintile 5⁸ (**Figure 2.9**).

⁸ The Māori:non-Māori non-Pacific rate ratio for quintile 5 was 2.21, 95 percent CI 1.15–4.25.

Figure 2.9: Mortality (rates per 100,000 population and 95 percent confidence intervals) in tamariki Māori aged 10–14 years by NZ Deprivation Index quintile, compared with non-Māori non-Pacific children, Aotearoa/New Zealand 2013–17 combined (n=60 Māori and 76 non-Māori non-Pacific deaths)



nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 10–14 years.

Rangatahi Māori aged 15–19 years

During the 2013–17 period, there were 246 deaths in rangatahi Māori aged 15–19 years. Intentional injury was the leading cause of death (46 percent), with 108 deaths due to suicide and six by assault. The remaining deaths were due to unintentional injury (33 percent) and medical conditions (20 percent). The leading causes of unintentional injury death were transport (n=64) and drowning (n=7), followed by poisoning (n=3). The leading medical causes of death were neoplasms (n=21) and diseases of the circulatory system (n=7), with congenital anomalies accounting for five deaths and diseases of the nervous system for four deaths. Rangatahi Māori in this age group had higher mortality rates both overall, and for each category of death, compared with non-Māori non-Pacific young people (**Table 2.8**).

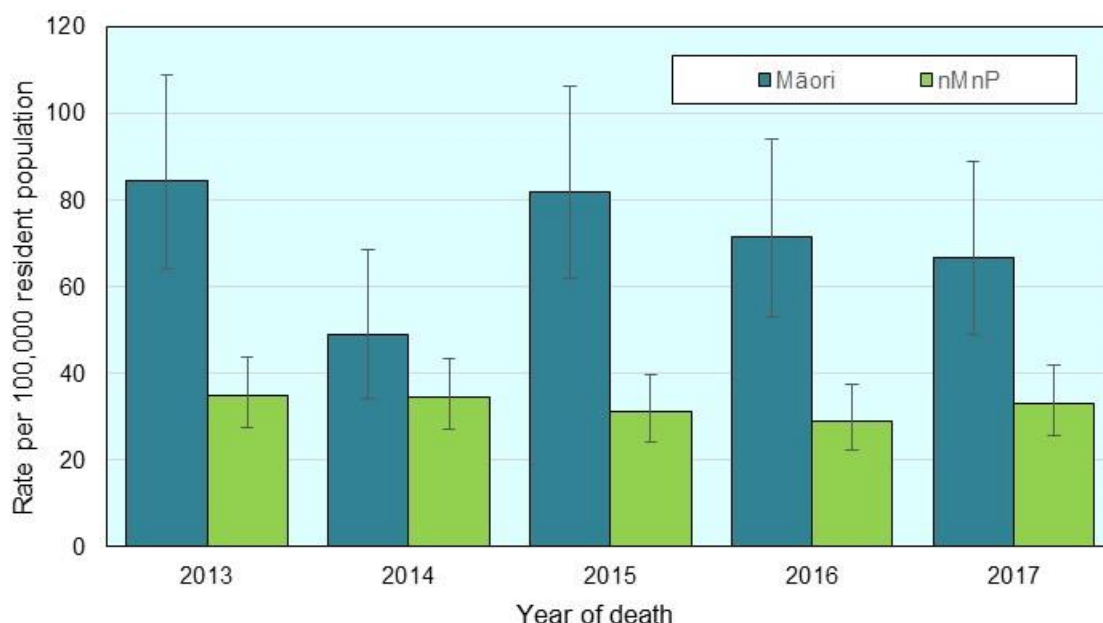
Table 2.8: Mortality (number of deaths and rates per 100,000 population) in rangatahi Māori aged 15–19 years by cause and year of death, compared with non-Māori non-Pacific young people, Aotearoa/New Zealand 2013–17 (n=594 deaths)

Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
Medical	13	7	12	10	7	49	99	14.06	9.27	1.52 (1.08–2.14)
Unintentional injury	18	14	18	16	16	82	138	23.54	12.92	1.82 (1.39–2.39)
Intentional injury	27	13	27	24	23	114	111	32.72	10.39	3.15 (2.42–4.09)
Missing data	0	0	0	0	<3	<3	0	s	0	–
Total	58	34	57	50	47	246	348	70.61	32.58	2.17 (1.84–2.55)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 15–19 years.

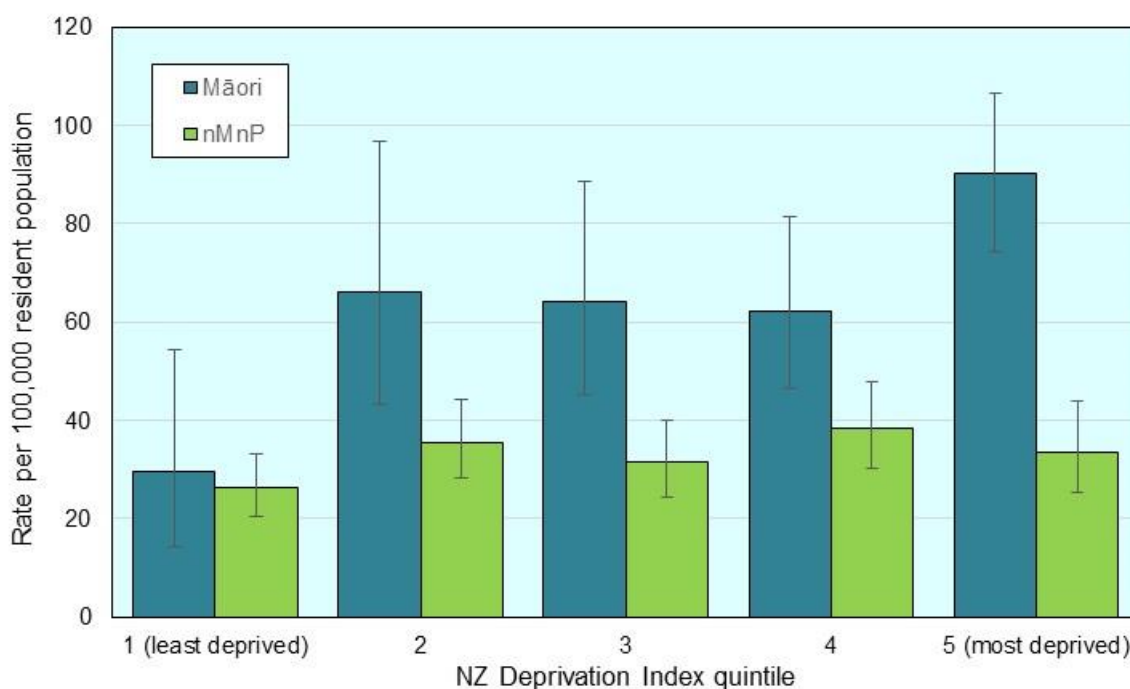
Figure 2.10: Mortality (rates per 100,000 population and 95 percent confidence intervals) in rangatahi Māori aged 15–19 years by year of death, compared with non-Māori non-Pacific young people, Aotearoa/New Zealand 2013–17 (n=246 Māori and 348 non-Māori non-Pacific deaths)



nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 15–19 years.

Figure 2.11: Mortality (rates per 100,000 population and 95 percent confidence intervals) in rangatahi Māori aged 15–19 years by NZ Deprivation Index quintile, compared with non-Māori non-Pacific young people, Aotearoa/New Zealand 2013–17 combined (n=246 Māori and 348 non-Māori non-Pacific deaths)



nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 15–19 years.

There has not been any significant change in mortality rates in this age group over the 2013–17 period (**Figure 2.10**).

When examined by deprivation quintile, Māori had a higher mortality rate than non-Māori non-Pacific at each level of deprivation except quintile 1.⁹ There was no clear pattern of higher mortality rates with increasing deprivation (**Figure 2.11**).

Rangatahi Māori aged 20–24 years

During 2013–17, there were 275 deaths in rangatahi Māori aged 20–24 years. The leading cause of death was intentional injury (44 percent), followed by unintentional injury (32 percent) and medical conditions (24 percent). Within these categories, suicide was the leading cause of intentional injury death, with 111 deaths; the remaining 11 were due to assault. Transport crashes accounted for 66 percent of unintentional injury deaths. The leading medical causes of death were neoplasms (n=17) and diseases of the nervous and circulatory systems (11 deaths each). Rangatahi Māori had a higher overall mortality rate, compared with non-Māori non-Pacific young people (rate ratio 1.99, 95 percent CI 1.72–2.31), and statistically significantly higher mortality from each category of death (**Table 2.9**).

⁹ The Māori:non-Māori non-Pacific rate ratio for quintile 2 was 1.88, 95 percent CI 1.21–2.92; for quintile 4 the rate ratio was 1.63, 95 percent CI 1.14–2.31.

Table 2.9: Mortality (number of deaths and rates per 100,000 population) in rangatahi Māori aged 20–24 years by cause and year of death, compared with non-Māori non-Pacific young people, Aotearoa/New Zealand 2013–17 (n=799 deaths)

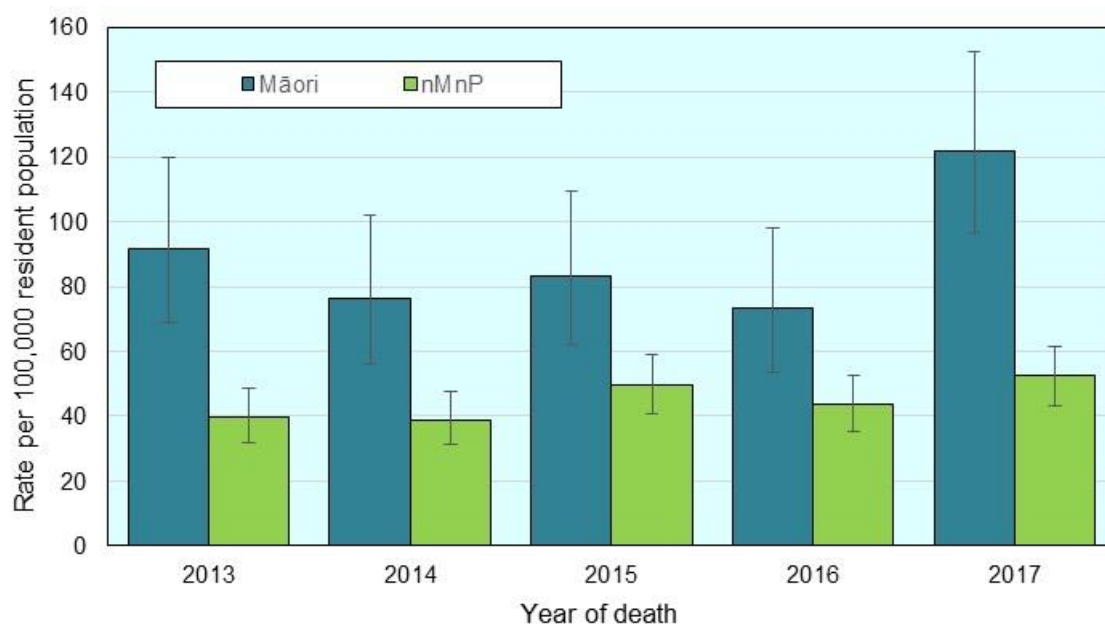
Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Māori	Non-Māori non-Pacific	Māori	Non-Māori non-Pacific	
Medical	10	11	11	10	23	65	132	21.17	11.32	1.87 (1.39–2.52)
Unintentional injury	19	13	16	13	26	87	204	28.34	17.49	1.62 (1.26–2.08)
Intentional injury	25	22	23	23	29	122	185	39.74	15.86	2.51 (1.99–3.15)
Missing data	0	0	<3	0	0	<3	3	s	0.26	–
Total	54	46	51	46	78	275	524	89.57	44.92	1.99 (1.72–2.31)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 20–24 years.

Mortality rates for rangatahi Māori have not changed substantially since 2013. However, the mortality rates for rangatahi Māori have been statistically significantly higher than those for non-Māori non-Pacific young people (**Figure 2.12**).

Figure 2.12: Mortality (rates per 100,000 population and 95 percent confidence intervals) in rangatahi Māori aged 20–24 years by year of death, compared with non-Māori non-Pacific young people, Aotearoa/New Zealand 2013–17 (n=275 Māori and 524 non-Māori non-Pacific deaths)



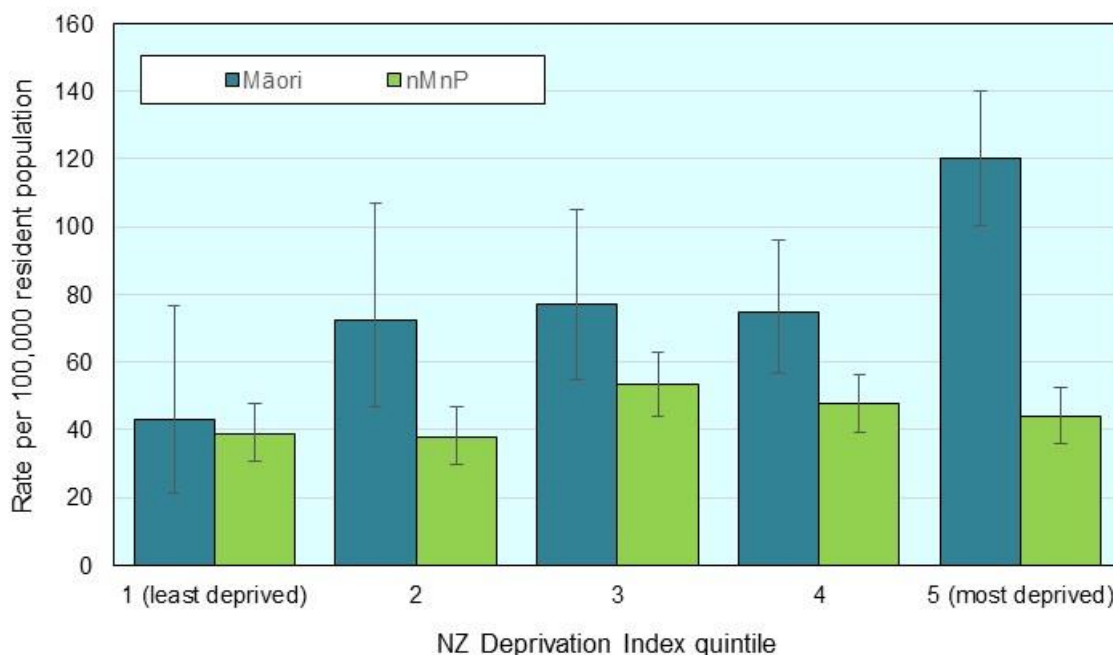
nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 20–24 years.

Rangatahi Māori had statistically significantly higher mortality rates than non-Māori non-Pacific young people in those residing in more deprived areas (quintiles 2–5)¹⁰ (**Figure 2.13**).

¹⁰ The Māori:non-Māori non-Pacific rate ratio for quintile 2 was 1.93, 95 percent CI 1.23–3.02; for quintile 3 the rate ratio was 1.44, 95 percent CI 1.00–2.06.

Figure 2.13: Mortality (rates per 100,000 population and 95 percent confidence intervals) in rangatahi Māori aged 20–24 years by NZ Deprivation Index quintile, compared with non-Māori non-Pacific young people, Aotearoa/New Zealand 2013–17 combined (n=275 Māori and 521 non-Māori non-Pacific deaths*)



* Excludes three cases with no available deprivation data.

nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 20–24 years.

3. Pacific mortality | Te takimate a ngā iwi Moana-nui-a-Kiwa

This chapter reports on mortality in Pacific children and young people. 'Total response' ethnicity is used to determine Pacific ethnicity for this chapter. This means that, if an individual has a Pacific ethnic group as any one of their ethnicities, they will be included here. In the rest of this report, 'prioritised' ethnicity is used. Prioritised ethnicity assigns one ethnic group to each individual, giving precedence to Māori, followed by Pacific, Asian, MELAA then European and Other ethnicities. Therefore, in the rest of the report, if an individual identified as being both Pacific and Māori, they would be counted as Māori. In this chapter, however, they will be included as Pacific. This chapter uses non-Pacific non-Māori as a comparator group, therefore, Māori who do not also identify as Pacific (n=853) are excluded, as are those with unknown ethnicity (n=4).

Key findings

- During the 2013–17 period, there were 374 Pacific children and young people who died.
- Nearly half of these deaths (46.8 percent) were due to medical conditions.
- While there have been fluctuations in the overall number of deaths for Pacific children and young people, there are no clear trends of either an increase or a decrease in the number of deaths overall.
- Marked inequities between Pacific and non-Pacific non-Māori children exist, with Pacific infants being much more likely to die overall (rate ratio 2.62, 95 percent CI 2.04–3.35), and much more likely to die from SUDI (rate ratio 6.42, 95 percent CI 4.28–9.63).
- For every age group, excluding those aged five to nine years, Pacific children and young people were more likely to die overall, and were more likely to die from medical conditions.
- In those aged 10–14 years and 15–19 years, Pacific children and young people were more likely than non-Pacific non-Māori children to die from intentional injury (predominantly suicide).

During 2013–17, there were 374 Pacific children and young people who died. This group is made up of children and young people who identify with a number of ethnic groups (**Table 3.1**). From the way the data is provided to the Mortality Review Database, it is not possible to determine if someone identified more strongly with a particular ethnic group. Therefore, groups are presented here in alphabetical order.

Table 3.1: Pacific mortality (number of deaths) in children and young people aged 28 days to 24 years by ethnic group and year of death, Aotearoa/New Zealand 2013–17 (n=374 deaths)

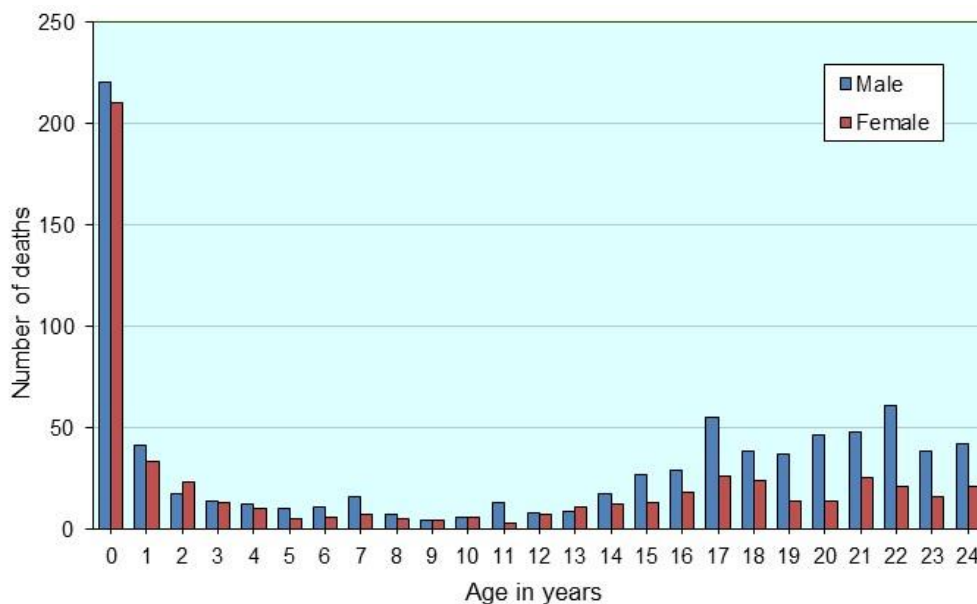
Ethnic groups	Deaths per year					Total
	2013	2014	2015	2016	2017	
Cook Island Māori	13	11	21	15	16	76
Cook Island Māori, Niuean	0	0	0	0	<3	<3
Cook Island Māori, Samoan	<3	<3	0	<3	4	9
Cook Island Māori, Tongan	0	<3	<3	<3	0	4
Fijian	<3	<3	5	6	3	17
Fijian, Niuean	<3	0	0	0	0	<3
Kiribati	0	0	<3	0	<3	<3
Niuean	<3	6	3	<3	<3	14
Samoan	30	32	30	18	27	137
Samoan, Fijian	0	<3	0	0	0	<3
Samoan, Niuean	0	<3	<3	<3	0	5
Samoan, Niuean, Fijian	0	<3	0	0	0	<3
Samoan, Tokelauan	<3	0	<3	0	<3	<3
Samoan, Tongan	<3	3	0	0	4	9
Samoan, Tongan, Niuean	0	0	0	<3	0	<3
Solomon Islander	0	0	<3	0	0	<3
Tokelauan	3	<3	<3	<3	<3	6
Tongan	18	17	13	18	12	78
Tongan, Niuean	<3	<3	0	<3	0	4
Tuvaluan	<3	<3	<3	<3	0	3
Tuvaluan, Samoan	<3	<3	0	0	<3	<3
Total	74	81	79	68	72	374

Note: Non-Pacific ethnicities are not displayed.

Source: Mortality Review Database.

During the 2002–17 period, there were 1,373 deaths in Pacific children and young people. Deaths peaked in those aged 28 days to one year and reduced thereafter. As in the non-Pacific population, there was an increase in deaths in the teenage years. This increase was not as high, however, as what might have been expected, given the pattern of death in the population overall (see **Figure 13.1**). Furthermore, while male deaths predominated, this was not to the same degree as in non-Pacific populations (**Figure 3.1**).

Figure 3.1: Pacific mortality (number of deaths) in children and young people aged 28 days to 24 years by age and sex, Aotearoa/New Zealand 2002–17 (n=1,373 deaths)



Source: Mortality Review Database.

During the years 2013–17, there were 374 deaths in Pacific children and young people. Nearly half were due to medical conditions (47 percent), with 19 percent being due to unintentional injuries. Seventeen percent were due to intentional injuries (predominantly suicide but with some deaths due to assault) and 17 percent were due to SUDI/SUD (**Table 3.2**).

Table 3.2: Pacific mortality (number of deaths) in children and young people aged 28 days to 24 years by cause of death and age group, Aotearoa/New Zealand 2013–17 combined (n=374 deaths)

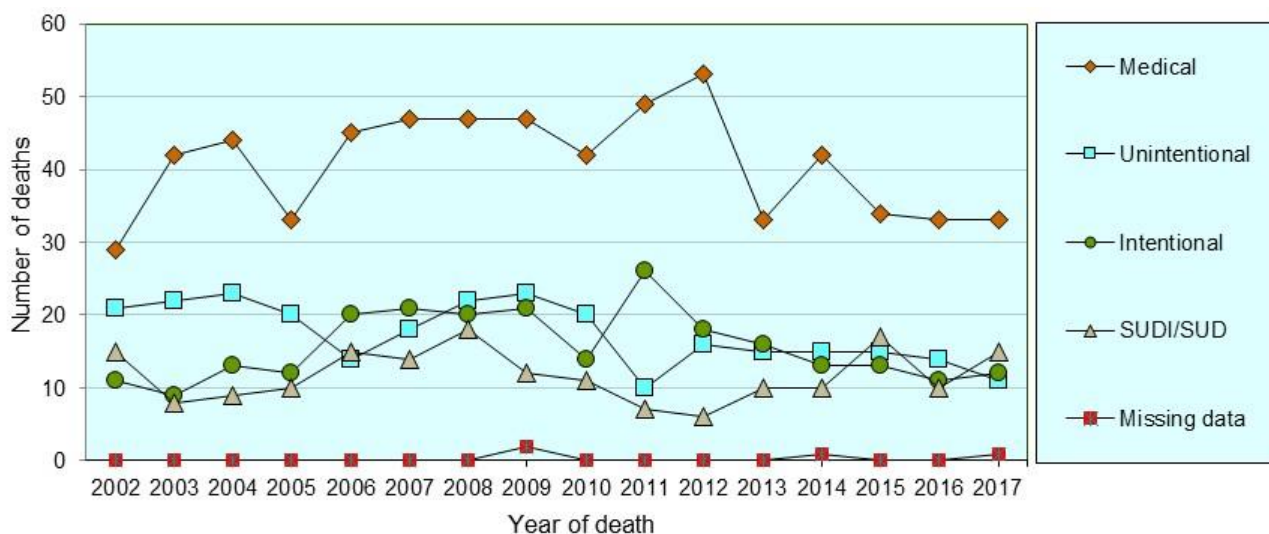
Category	<1 year*	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total	Percentage (%)
Medical	42	29	17	16	28	43	175	46.8
Unintentional injury	<3	11	4	5	18	32	70	18.7
Intentional injury	<3	<3	0	7	31	26	65	17.4
SUDI/SUD	61	<3	–	–	–	–	62	16.6
Missing data	0	<3	<3	0	<3	<3	<3	0.5
Total	104	42	20	28	78	102	374	100

* This category represents infants 28 days and older, and less than one calendar year in age.

Source: Mortality Review Database.

There have been fluctuations in the number of deaths by cause over the years since 2002, no clear trends of either an increase or decrease in the number of deaths can be seen (**Figure 3.2** and **Table 3.3**).

Figure 3.2: Pacific mortality (number of deaths) in children and young people aged 28 days to 24 years by cause and year of death, Aotearoa/New Zealand 2002–17 (n=1,373 deaths)



Source: Mortality Review Database.

Table 3.3: Pacific mortality (number of deaths and rates per 100,000 population) in children and young people aged 28 days to 24 years by age group and year of death, Aotearoa/New Zealand 2013–17 (n=374 deaths)

Category	2013	2014	2015	2016	2017	Total	Percentage (%)	Rate
28 days to 1 year*	21	20	25	18	20	104	27.8	2.29
1–4 years	7	9	8	9	9	42	11.2	28.34
5–9 years	<3	7	4	4	3	20	5.3	11.49
10–14 years	7	4	7	5	5	28	7.5	16.73
15–19 years	19	14	17	12	16	78	20.9	48.91
20–24 years	18	27	18	20	19	102	27.3	74.58
Total	74	81	79	68	72	374	100	44.99

* Note rate is per 1,000 live births.

Sources: Numerator: Mortality Review Database; Denominator: Statistics New Zealand Total Response Pacific usually resident population 2013–17, 0–24 years.

Medical conditions were the leading category of death, with 175 deaths from 2013 to 2017. The most common causes of medical death were neoplasms (n=37), congenital anomalies (n=26), diseases of the respiratory system (n=23), diseases of the circulatory system (n=22) and diseases of the nervous system (n=21). Intentional injury accounted for 17.4 percent of deaths, with suicide accounting for 61 (94 percent) of these deaths. Within unintentional injury deaths, 41 (59 percent) were due to transport crashes. Sixty-one deaths were due to SUDI (**Table 3.4**).

Table 3.4: Pacific mortality (number of deaths and rates per 100,000 population) by cause of death and age group, Aotearoa/New Zealand 2013–17 combined (n=374 deaths)

Cause of death	<1 year*	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total	%	Rate 2012–16
Medical									
Infectious and parasitic disease	<3	5	0	<3	<3	0	7	1.87	0.84
Neoplasms	0	7	8	4	6	12	37	9.89	4.45
Diseases of the blood and blood-forming organs and disorders of the immune system	3	<3	<3	0	<3	<3	6	1.6	0.72
Endocrine, nutritional and metabolic diseases	0	0	<3	<3	<3	<3	6	1.6	0.72
Mental and behavioural disorders	0	0	0	0	0	0	0	0	0
Diseases of the nervous system	<3	5	<3	3	<3	9	21	5.61	2.53
Diseases of the eye and adnexa	0	0	0	0	0	0	0	0	0
Diseases of the ear and mastoid process	0	0	0	0	0	0	0	0	0
Diseases of the circulatory system	4	3	0	3	5	7	22	5.88	2.65
Diseases of the respiratory system	6	6	<3	5	3	<3	23	6.15	2.77
Diseases of the digestive system	<3	<3	0	0	0	<3	<3	x	s
Diseases of the skin and subcutaneous tissue	0	0	0	<3	0	<3	<3	x	s
Diseases of the musculoskeletal system and connective tissue	0	0	0	<3	<3	<3	<3	x	s
Diseases of the genitourinary system	0	0	0	0	0	3	3	0.8	0.36
Pregnancy, childbirth and the puerperium	0	0	0	0	0	0	0	0	0
Certain conditions originating in the perinatal period	15	0	0	0	0	0	15	4.01	1.8
Congenital anomalies	10	<3	4	<3	7	3	26	6.95	3.13
Symptoms and abnormal findings not elsewhere classified	0	<3	0	0	<3	<3	4	1.07	0.48
Total medical	42	29	17	16	28	43	175	46.79	21.05
Unintentional injury									
Cut/pierce	0	0	0	0	0	0	0	0	0
Drowning	0	3	<3	<3	3	5	13	3.48	1.56
Fall	0	0	0	0	<3	<3	<3	x	s
Fire/hot object or substance	0	0	<3	<3	<3	0	<3	x	s
Firearm	0	0	0	0	0	0	0	0	0
Machinery	0	0	0	0	0	<3	<3	x	s
Transport	<3	3	<3	3	12	20	41	10.96	4.93
Natural/environmental	0	0	0	0	0	0	0	0	0
Overexertion	0	0	0	0	0	0	0	0	0
Poisoning	0	<3	<3	0	<3	4	8	2.14	0.96
Struck by, against	0	<3	0	0	0	0	<3	x	s
Suffocation	0	<3	0	0	<3	<3	<3	x	s
Other specified, classifiable	0	0	0	0	0	<3	<3	x	s
Other specified, not elsewhere classified	0	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0	0
Complications of medical and surgical care	0	0	0	0	0	0	0	0	0
Sequelae of surgical and medical care as external cause	0	0	0	0	0	0	0	0	0
Total unintentional injury	<3	11	3	5	18	32	70	18.72	8.42

Cause of death	<1 year*	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total	%	Rate 2012–16
Intentional injury									
Assault	0	<3	0	0	<3	<3	4	1.07	0.48
Suicide	0	0	0	7	30	24	61	16.31	7.34
Total intentional injury	0	<3	0	7	31	26	65	17.38	7.82
SUDI/SUD									
SUDI (28 days to <1 year)	61	0	0	0	0	0	61	16.31	7.34
SUD (1–2 years)	0	<3	0	0	0	0	<3	x	s
Total SUDI/SUD	61	<3	0	0	0	0	62	16.58	7.46
Missing data	0	0	0	<3	<3	<3	<3	x	s
Total	104	42	20	28	78	102	374	100	44.99

* This category represents infants 28 days and older, and less than one calendar year in age.

'x' indicates percent not calculated due to small numbers.

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Statistics New Zealand Total Response Pacific usually resident population 2013–17, 0–24 years.

Post-neonatal infants

During the 2013–17 period, there were 104 deaths in Pacific post-neonatal infants aged 28 days to one year. The leading cause of death in this age group was SUDI (58.7 percent), followed by medical conditions (40.4 percent) (**Table 3.5**). Compared with non-Pacific non-Māori infants, Pacific infants had a higher rate of SUDI deaths (rate ratio 6.42, 95 percent CI 4.28–9.63) and a higher rate of medical deaths (rate ratio 1.51, 95 percent CI 1.06–2.16) (**Figure 3.3**). Pacific infants had a higher overall mortality, compared with non-Pacific non-Māori infants (rate ratio 2.62, 95 percent CI 2.04–3.35).

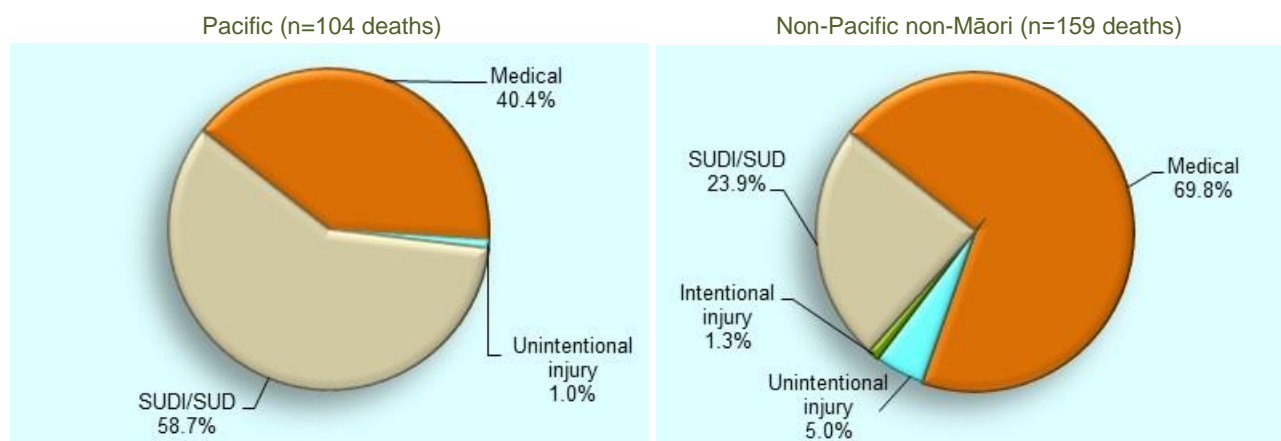
Table 3.5: Mortality (number of deaths and rates per 1,000 live births) in infants aged 28 days to less than one year by cause and year of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 (n=263 deaths)

Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Pacific	Non-Pacific non-Māori	Pacific	Non-Pacific non-Māori	
Medical	10	10	8	8	6	42	111	0.92	0.61	1.51 (1.06–2.16)
Unintentional injury	<3	0	0	0	0	<3	8	s	0.04	0.50 (0.06–4.00)
Intentional injury	0	0	0	0	0	0	<3	0	s	–
SUDI	10	10	17	10	14	61	38	1.33	0.21	6.42 (4.28–9.63)
Missing data	<3	0	0	0	0	<3	0	s	0	-
Total	21	20	25	18	20	104	159	2.27	0.87	2.62 (2.04–3.35)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2013–16, NZMRDG 2017.

Figure 3.3: Mortality (%) in infants aged 28 days to less than one year by cause of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 combined



Source: Mortality Review Database.

Children aged one to four years

There were 42 deaths in Pacific children aged one to four years during 2013–17. The leading cause of death was medical conditions. The most common medical conditions were neoplasms (n=7), diseases of the respiratory system (n=6), infectious and parasitic diseases, and diseases of the nervous system (n=5 each). Eleven deaths were due to unintentional injury (26.2 percent), with four of these being transport related and three due to drowning. Pacific children aged one to four years had a higher overall mortality rate, as well a higher rate of deaths from medical causes (**Table 3.4** and **Table 3.6**).

Table 3.6: Mortality (number of deaths and rates per 100,000 population) in children aged one to four years by cause and year of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 (n=168 deaths)

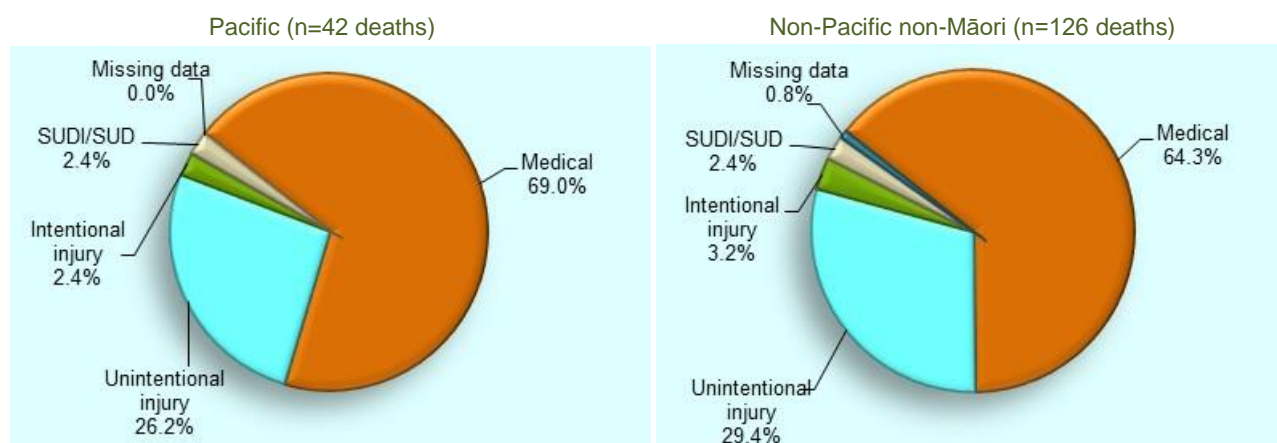
Category	2013	2014	2015	2016	2017	Total number		Rate		Rate ratio (95% CI)
						Pacific	Non-Pacific non-Māori	Pacific	Non-Pacific non-Māori	
Medical	7	6	4	4	8	29	81	19.63	9.88	1.99 (1.30–3.04)
Unintentional injury	0	3	4	4	0	11	37	7.44	4.51	1.65 (0.84–3.23)
Intentional injury	0	0	0	<3	0	<3	4	s	0.49	–
SUD	0	0	0	0	<3	<3	3	s	0.37	–
Missing data	0	0	0	<3	<3	<3	<3	s	s	–
Total	7	9	8	9	9	42	126	28.42	15.36	1.85 (1.30–2.62)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Statistics New Zealand Total Response Pacific usually resident population 2013–17, one to four years.

Compared with non-Pacific non-Māori children, Pacific children had a higher percentage of deaths due to medical conditions and a lower percentage due to unintentional and intentional injury (**Figure 3.4**).

Figure 3.4: Mortality (%) in children aged one to four years by cause of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 combined



Source: Mortality Review Database.

Children aged five to nine years

Table 3.7: Mortality (number of deaths and rates per 100,000 population) in children aged five to nine years by cause and year of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 (n=112 deaths)

Category	2013	2014	2015	2016	2017	Total		Total		Rate ratio (95% CI)
						Pacific	Non-Pacific non-Māori	Pacific	Non-Pacific non-Māori	
Medical conditions	<3	7	3	3	3	17	60	9.77	6.15	1.59 (0.93–2.72)
Unintentional injury	<3	–	<3	<3	<3	3	29	1.72	2.97	0.58 (0.18–1.90)
Intentional injury	–	–	–	–	–	–	3	–	0.31	–
Missing	<3	–	<3	<3	–	<3	–	s	–	–
Total	<3	7	4	4	3	20	92	11.49	9.44	1.22 (0.75–1.98)

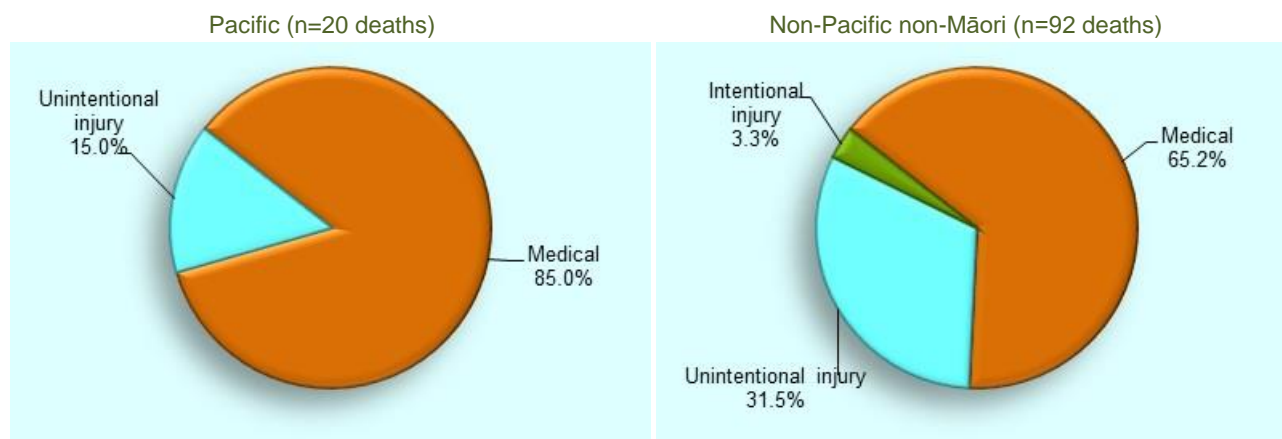
's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Statistics New Zealand Total Response Pacific usually resident population 2013–17, five to nine years.

In Pacific children aged five to nine years during 2013–17, there were 20 deaths. The leading cause of death was medical conditions, with 17 deaths (**Table 3.7**). The most common medical conditions causing death were neoplasms (n=8) and congenital anomalies (n=4) (**Table 3.4**).

Compared with non-Pacific non-Māori children, Pacific children had a higher percentage of medical deaths and a lower percentage of unintentional injury deaths (**Figure 3.5**).

Figure 3.5: Mortality (%) in children aged five to nine years by cause of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 combined



Source: Mortality Review Database.

Children aged 10–14 years

During the 2013–17 period, there were 28 deaths in Pacific children aged 10–14 years. The leading cause of death was medical conditions, with the most common medical conditions causing death being diseases of the respiratory system (n=5) and neoplasms (n=4). Seven deaths in this age group were due to suicide. Pacific children aged 10–14 years had statistically significantly higher mortality rates from medical conditions, intentional injury and overall (**Table 3.4** and **Table 3.8**)

Table 3.8: Mortality (number of deaths and rates per 100,000 population) in children aged 10–14 years by cause and year of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 (n=104 deaths)

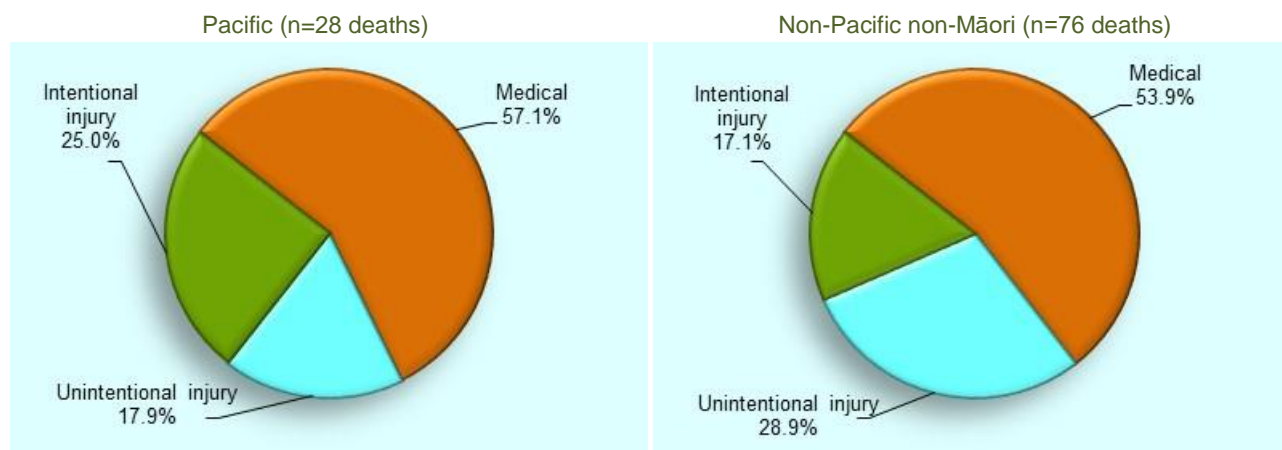
Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Pacific	Non-Pacific non-Māori	Pacific	Non-Pacific non-Māori	
Medical	3	3	3	3	4	16	41	9.56	4.28	2.23 (1.25–3.98)
Unintentional injury	3	0	<3	<3	<3	5	22	2.99	2.29	1.30 (0.49–3.44)
Intentional injury	<3	<3	3	<3	<3	7	13	4.18	1.36	3.08 (1.23–7.73)
Missing	<3	<3	<3	<3	0	<3	0	s	0	–
Total	7	4	7	5	5	28	76	16.73	7.93	2.11 (1.37–3.25)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Statistics New Zealand Total Response Pacific usually resident population 2013–17, 10–14 years.

When compared with non-Pacific non-Māori, Pacific children had similar percentages of medical deaths (57 percent versus 54 percent), with lower unintentional injury but higher intentional injury deaths (**Figure 3.6**).

Figure 3.6: Mortality (%) in children aged 10–14 years by cause of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 combined



Source: Mortality Review Database.

Young people aged 15–19 years

In Pacific young people aged 15–19 years, there were 78 deaths during 2013–17. The leading cause of death was intentional injury (n=31), with nearly all of these deaths being due to suicide. The next leading cause of death was medical conditions, where there were seven deaths due to congenital anomalies, six due to neoplasms and five due to diseases of the circulatory system. The leading cause of unintentional injury death was transport crashes, with 12 deaths (59 percent). Pacific young people in this age group had statistically significantly higher mortality rates overall, compared with non-Pacific non-Māori, as well higher rates for medical conditions and intentional injuries (**Table 3.4** and **Table 3.9**)

Table 3.9: Mortality (number of deaths and rates per 100,000 population) in young people aged 15–19 years by cause and year of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 (n=426 deaths)

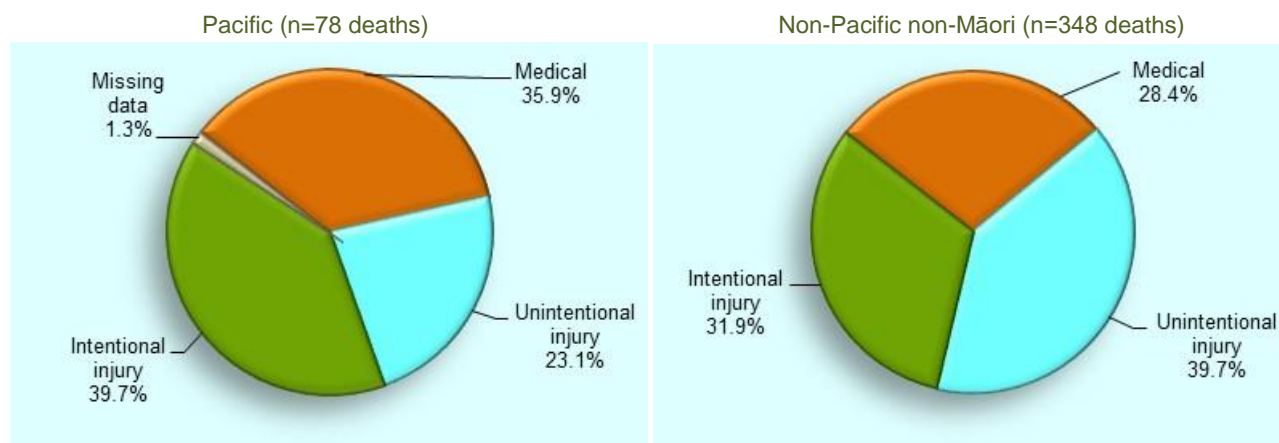
Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Pacific	Non-Pacific non-Māori	Pacific	Non-Pacific non-Māori	
Medical	4	5	6	8	5	28	99	17.56	9.27	1.89 (1.25–2.88)
Unintentional injury	8	3	<3	<3	4	18	138	11.29	12.92	0.87 (0.53–1.43)
Intentional injury	7	6	9	3	6	31	111	19.44	10.39	1.87 (1.26–2.78)
Missing	0	0	<3	<3	<3	<3	0		0	0
Total	19	14	17	12	16	78	348	48.91	32.58	1.50 (1.17–1.92)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Statistics New Zealand Total Response Pacific usually resident population 2013–17, 15–19 years.

Compared with non-Pacific non-Maori young people, Pacific young people had a higher percentage of deaths due to intentional injury (40 percent compared with 32 percent), a slightly lower percentage due to medical conditions, and a lower percentage due to unintentional injury (23 percent compared with 40 percent) (**Figure 3.7**).

Figure 3.7: Mortality (%) in young people aged 15–19 years by cause of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 combined



Source: Mortality Review Database.

Young people aged 20–24 years

During 2013–17, there were 102 deaths in Pacific young people aged 20–24 years. The leading cause of death was medical conditions, with the most common medical causes being neoplasms (n=12), diseases of the nervous system (n=9) and diseases of the circulatory system (n=7). The leading cause of unintentional injury death was transport crashes (59 percent). Twenty-six deaths were due to intentional injury, and almost all of these were due to suicide. Pacific young people in this age group had statistically significantly higher rates of medical deaths, and a higher mortality rate overall, compared with non-Pacific non-Māori young people (**Table 3.4** and **Table 3.10**)

Table 3.10: Mortality (number of deaths and rates per 100,000 population) in young people aged 20–24 years by cause and year of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 (n=626 deaths)

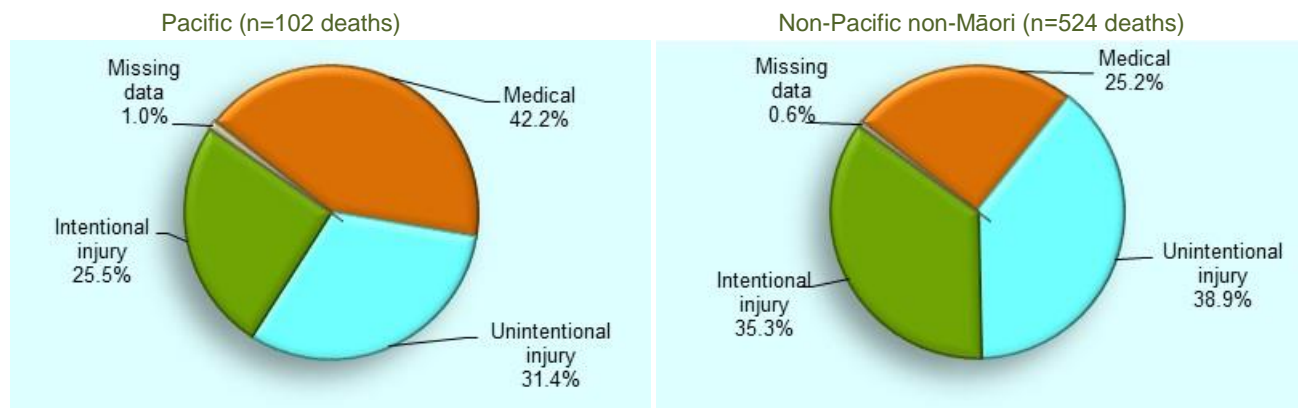
Category	2013	2014	2015	2016	2017	Total		Rate		Rate ratio (95% CI)
						Pacific	Non-Pacific non-Māori	Pacific	Non-Pacific non-Māori	
Medical	8	11	10	7	7	43	132	31.44	11.32	2.78 (1.97–3.92)
Unintentional injury	<3	9	7	7	7	32	204	23.4	17.49	1.34 (0.92–1.94)
Intentional injury	8	6	<3	6	6	26	185	19.01	15.86	1.20 (0.80–1.81)
Missing	<3	<3	<3	0	0	<3	3	s	0.26	–
Total	18	27	18	20	19	102	524	74.58	44.92	1.66 (1.34–2.05)

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Statistics New Zealand Total Response Pacific usually resident population 2013–17, 20–24 years.

When compared with non-Pacific non-Māori young people, Pacific young people had a higher proportion of medical deaths, and a lower proportion of injury deaths both unintentional and intentional (**Figure 3.8**).

Figure 3.8: Mortality (%) in young people aged 20–24 years by cause of death, Pacific compared with non-Pacific non-Māori, Aotearoa/New Zealand 2013–17 combined



Source: Mortality Review Database.

4. Sudden unexpected death in infancy (SUDI) | Te mate ohorere o te kōhungahunga

This chapter reports on deaths due to SUDI from 2002 to 2017.

Key findings

- There were 765 deaths from SUDI during the 16 years from 2002 to 2017.
- Forty-five of these deaths were in 2017.
- When examined by broad ethnic categories, the inequities that exist are clear, with pēpe Māori having a higher SUDI rate than non-Māori non-Pacific infants.
- After two periods of some gains being made, the SUDI rate for Māori appears to be plateauing.
- The SUDI mortality rate for Pacific infants fluctuates somewhat, but over the past 10 years there is some evidence of an increase in the SUDI rate.

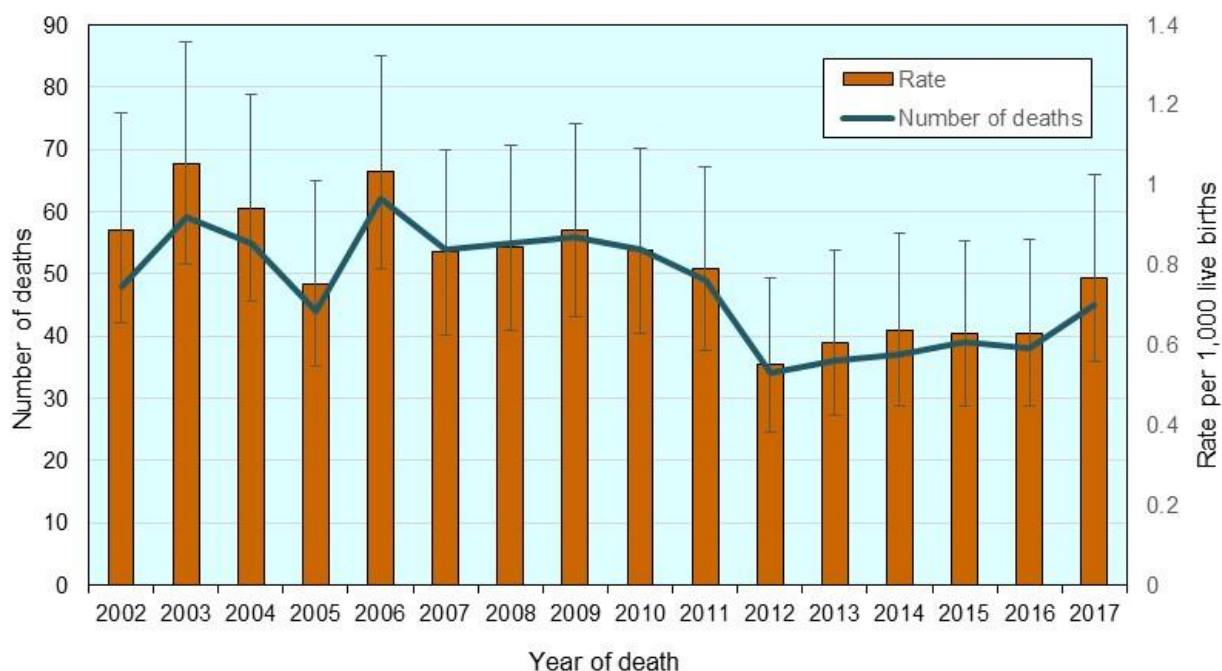
During the years 2002–17, there were 765 deaths due to SUDI in post-neonatal infants (aged 28 days to 11 months). The SUDI mortality rate has varied substantially over this time, ranging from a low of 0.55 per 1,000 live births in 2012 to a high of 1.05 per 1,000 live births in 2003 (**Table 4.1** and **Figure 4.1**).

Table 4.1: Post-neonatal SUDI mortality (number of deaths and rates per 1,000 live births) by year of death, Aotearoa/New Zealand 2002–17 (n=765 deaths)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Number of deaths	48	59	55	44	62	54	55	56	54	49	34	36	37	39	38	45	765
Rate	0.89	1.05	0.94	0.75	1.03	0.83	0.85	0.89	0.84	0.79	0.55	0.6	0.64	0.63	0.63	0.77	0.79

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2002–16, NZMRDG 2017.

Figure 4.1: Post-neonatal SUDI mortality (number of deaths and rates per 1,000 live births) by year of death, Aotearoa/New Zealand 2002–17 (n=765 deaths)

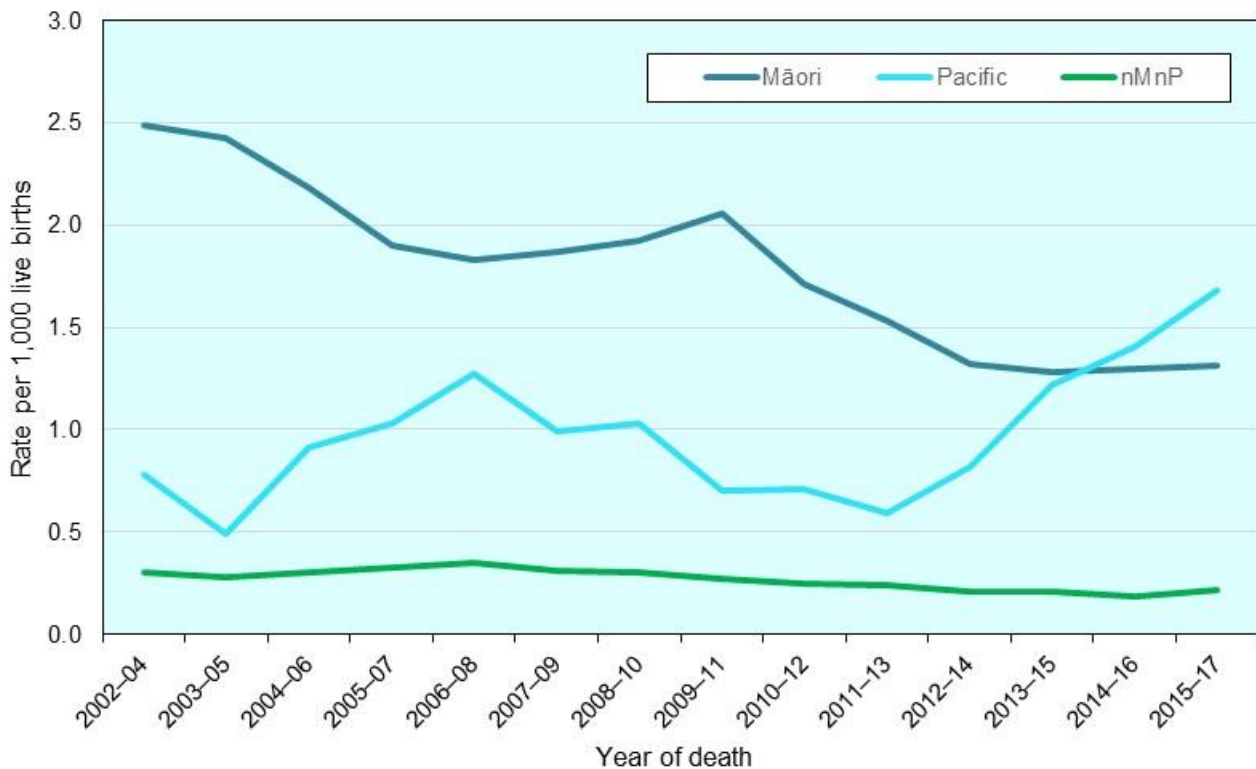


Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2002–16, NZMRDG 2017.

When examined by broad ethnic categories, the inequities that exist are clear, with Māori having a higher SUDI rate than those in the non-Māori non-Pacific group. The SUDI mortality rate for Pacific post-neonatal infants fluctuates somewhat, but over the past 10 years there is some evidence of an increase in the SUDI rate (**Figure 4.2**).¹¹

¹¹ Chi-squared test for trend for Pacific SUDI mortality 2008–17: p-value=0.048.

Figure 4.2: Post-neonatal SUDI mortality (three-year rolling rates per 1,000 live births) by prioritised ethnic category and year of death (rolling three-year periods), Aotearoa/New Zealand 2002–17 (n=764 deaths*)



* Excludes one case with unknown ethnicity.

nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2002–16, NZMRDG 2017.

Similarly, there was substantial variation in SUDI mortality rates by DHB of residence, with some DHBs not having any, or very few, SUDI deaths during the five-year period, and others having a large number. In all DHBs where rates could be calculated, the SUDI mortality rate in pēpe Māori was higher than in non-Māori non-Pacific infants. This was also true for Pacific infants, where the SUDI rates were higher than in non-Pacific non-Māori infants in each DHB (**Table 4.2**).

Table 4.2: Post-neonatal SUDI mortality (number of deaths and rates per 1,000 live births), by DHB of residence and prioritised ethnic category, Aotearoa/New Zealand 2013–17 combined (n=195 deaths)

DHB of residence	Māori			Pacific			Non-Māori non-Pacific			Total		
	Deaths	Rate	95% CI	Deaths	Rate	95% CI	Deaths	Rate	95% CI	Deaths	Rate	95% CI
Northland	7	1.06	0.43–2.19	<3	s	–	3	0.68	0.14–1.99	11	0.98	0.49–1.74
Waitematā	4	0.57	0.15–1.45	<3	s	–	4	0.14	0.04–0.36	10	0.25	0.12–0.46
Auckland	4	1.00	0.27–2.57	6	1.2	0.44–2.62	0	0	0	10	0.33	0.16–0.61
Counties Manukau	26	2.40	1.57–3.52	21	1.77	1.09–2.70	<3	s	–	49	1.18	0.87–1.56
Waikato	16	1.46	0.84–2.38	3	2.69	0.55–7.86	5	0.33	0.11–0.78	24	0.89	0.57–1.32
Lakes	3	0.72	0.15–2.10	<3	s	–	0	0	0	4	0.53	0.14–1.36
Bay of Plenty	5	0.76	0.25–1.77	0	0	0	<3	s	–	7	0.49	0.20–1.01
Tairāwhiti	7	2.61	1.05–5.39	0	0	0	0	0	0	7	1.89	0.76–3.91
Hawke's Bay	10	1.97	0.95–3.63	0	0	0	<3	s	–	11	1.04	0.52–1.86
Taranaki	3	1.18	0.24–3.44	0	0	0	3	0.62	0.13–1.81	6	0.8	0.29–1.73
MidCentral	4	1.00	0.27–2.56	0	0	0	<3	s	–	5	0.47	0.15–1.11
Whanganui	5	2.48	0.80–5.78	<3	s	–	<3	s	–	7	1.67	0.67–3.44
Capital & Coast	7	2.02	0.81–4.15	3	1.6	0.33–4.68	<3	s	–	11	0.62	0.31–1.11
Hutt Valley	3	1.01	0.21–2.95	0	0	0	<3	s	–	4	0.41	0.11–1.05
Wairarapa	0	0	0	0	0	0	<3	s	–	<3	s	–
Nelson Marlborough	<3	s	–	0	0	0	0	0	0	<3	s	–
West Coast	0	0	0	0	0	0	<3	s	–	<3	s	–
Canterbury	5	0.89	0.29–2.08	<3	s	–	9	0.38	0.17–0.71	16	0.51	0.29–0.83
South Canterbury	0	0	0	0	0	0	0	0	0	0	0	0
Southern	5	1.47	0.48–3.43	<3	s	–	3	0.23	0.05–0.68	9	0.53	0.24–1.01
New Zealand	116	1.36	1.11–1.60	41	1.35	0.97–1.83	38	0.21	0.15–0.29	195	0.65	0.56–0.74

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2013–16, NZMRDG 2017.

5. Suicide mortality | Te takimate whakamomori

During the 2002–17 period, there were 1,887 deaths due to suicide. The age range for these deaths was 9–24 years. This chapter hereafter refers only to deaths in those aged 10–24 years.

Key findings

- During the 2002–17 period, there were 1,887 deaths due to suicide.
- In 2017, there were 131 suicide deaths in children and young people aged 10–24 years.
- Male deaths predominate, with an overall male to female ratio of 2.5.
- At younger ages, there is no difference in the number of deaths between males and females.
- Overall, deaths peak at age 20 years and reduce thereafter.
- By broad ethnic group, deaths in Māori have an earlier (younger) onset.
- Deaths due to suicide were more frequent in those residing in high-deprivation areas, as measured by the New Zealand Deprivation Index decile.

The suicide rate in children and young people aged 10–24 years has varied considerably over the past 14 years, with the lowest rate in 2014 of 10.48 deaths per 100,000 population, and the highest rate in 2012 of 16.79 per 100,000 population (**Table 5.1**). While suicide mortality rates have fluctuated a lot, there has been no statistically significant change in the overall rate over this timeframe (**Figure 5.1**).¹²

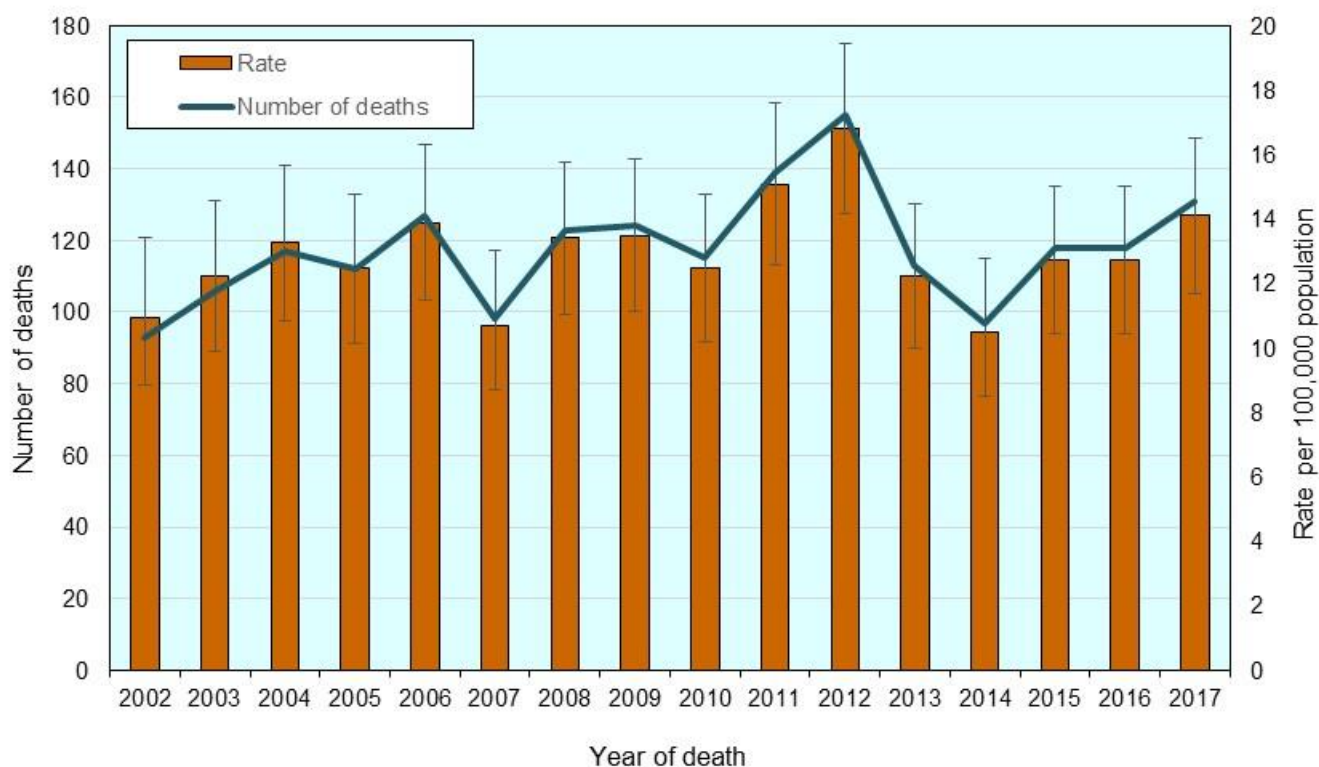
Table 5.1: Suicide mortality (number of deaths and rates per 100,000 population) in children and young people aged 10–24 years by year of death, Aotearoa/New Zealand 2002–17 (n=1,886 deaths)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2002–17
Number of deaths	93	106	117	112	127	98	123	124	115	139	155	113	97	118	118	131	1,886
Rate	10.94	12.23	13.25	12.46	13.88	10.69	13.4	13.49	12.5	15.08	16.79	12.23	10.48	12.73	12.72	14.1	12.95

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2002–17, 10–24 years.

¹² Chi-squared test for trend=1.36, p=0.24.

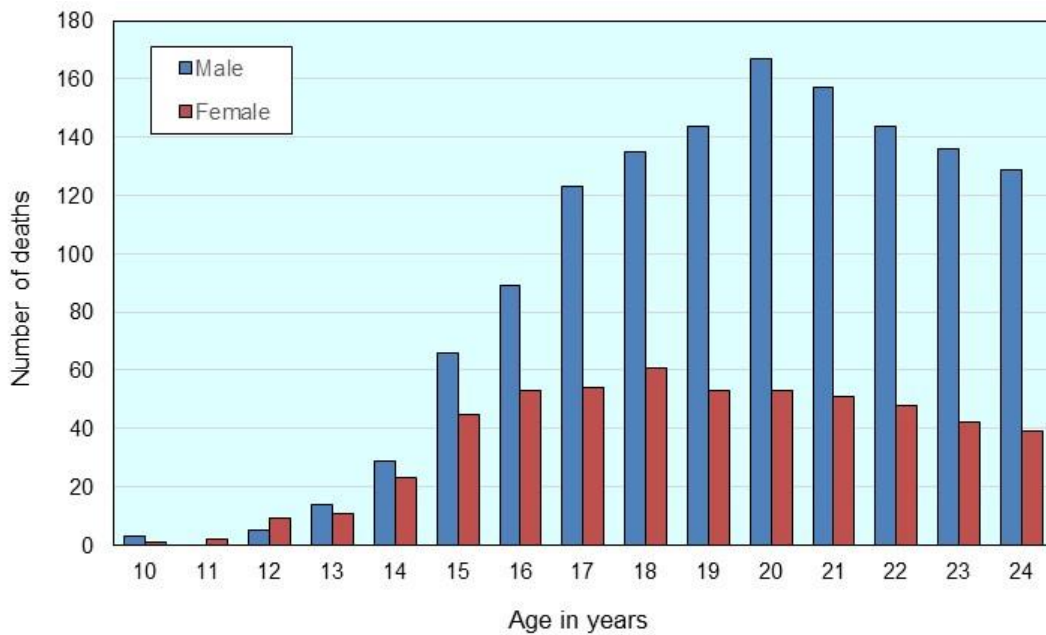
Figure 5.1: Suicide mortality (number of deaths and rates per 100,000 population) in children and young people aged 10–24 years by year of death, Aotearoa/New Zealand 2002–17 (n=1,886 deaths)



Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 10–24 years.

When examined by age and sex, several patterns are apparent. Male deaths due to suicide far outweigh female deaths, with an overall male to female ratio of 2.5. However, in the childhood years (10–14 years of age) there is very little difference in the number of suicide deaths between males and females. It is not until adolescence that the male predominance becomes evident. From age 17 years onwards, there are at least twice as many suicide deaths in males as there are in females, and by the age of 20 this increases to over three times more. The total number of deaths peaks at age 20 years and gradually reduces thereafter (**Figure 5.2**).

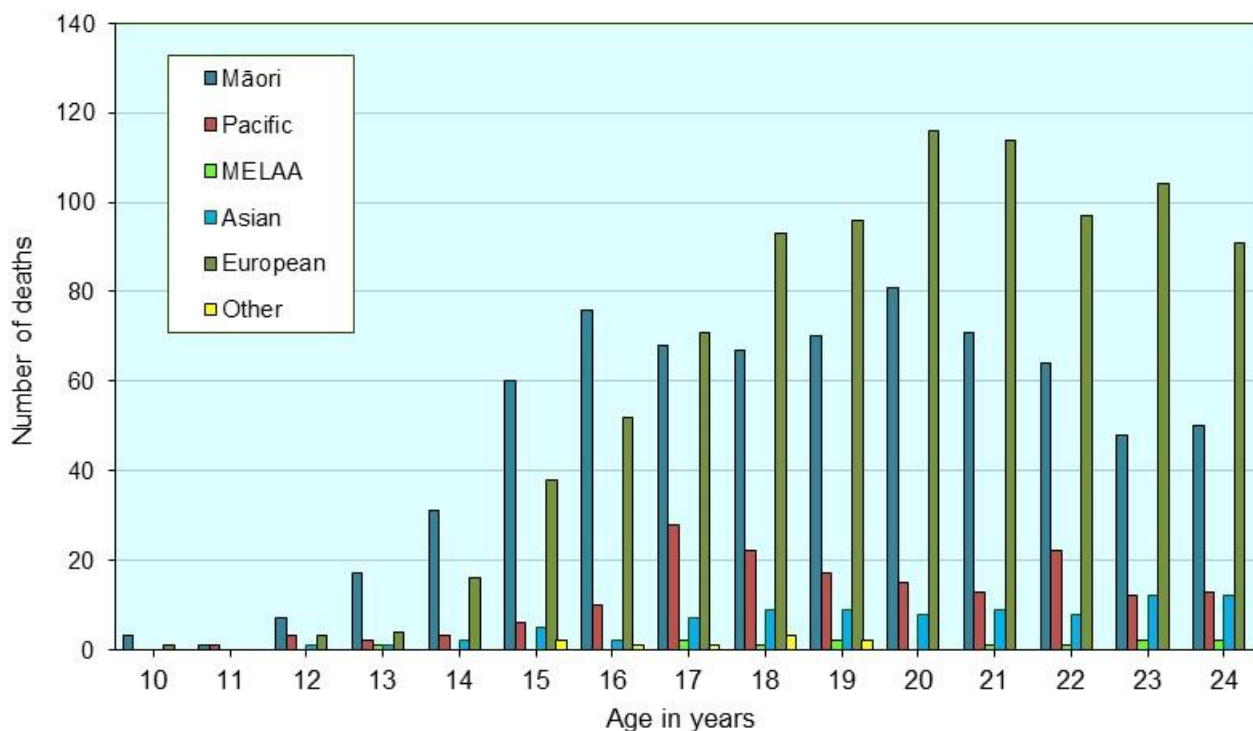
Figure 5.2: Suicide mortality (number of deaths) in children and young people aged 10–24 years by age and sex, Aotearoa/New Zealand 2002–17 (n=1,886 deaths)



Source: Mortality Review Database.

The age distribution of suicide deaths varies by prioritised ethnic group. Deaths in Māori tend to have a slightly earlier onset, with 61 percent of deaths in those aged 10–14 years being in tamariki Māori. While the main peak in suicide deaths in children and young people is at 20 years of age, this varies by ethnic group. For Māori, deaths due to suicide start earlier than in other ethnic groups and increase sharply up to 16 years of age. Suicide deaths in Māori do not start to reduce until 20 years of age. For those in the European and Other ethnic groups, suicide deaths peak at 20 years of age. **(Figure 5.3).**

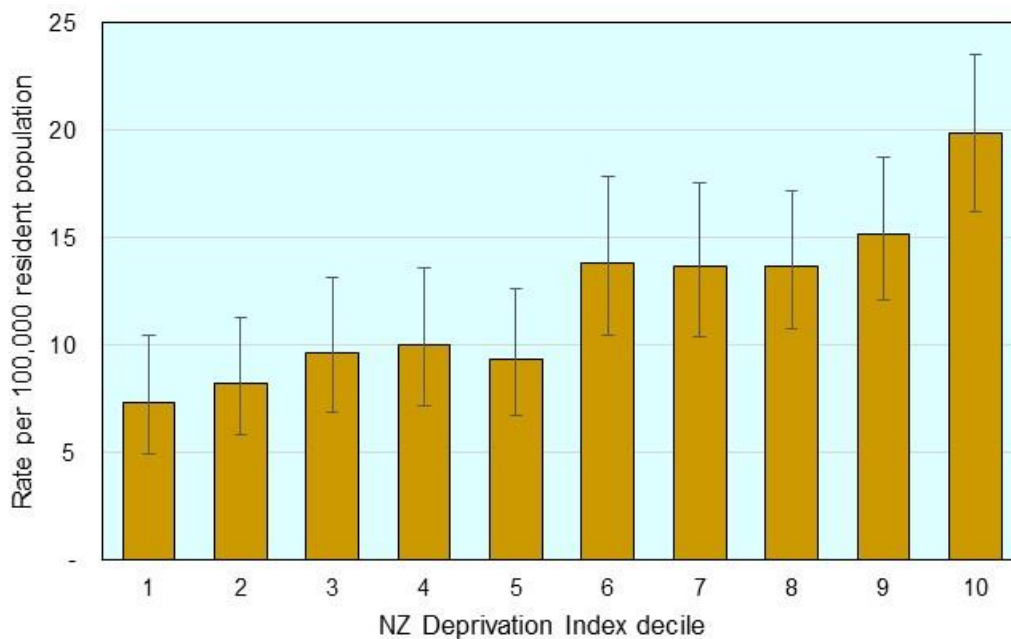
Figure 5.3: Suicide mortality (number of deaths) in children and young people aged 10–24 years by age and prioritised ethnic group, Aotearoa/New Zealand 2002–17 (n=1,883 deaths*)



* Excludes three cases where ethnicity was unknown.
 MELAA = Middle Eastern, Latin American and African.
 Source: Mortality Review Database.

Deaths due to suicide were more frequent in those residing in high-deprivation areas, as measured by the New Zealand Deprivation Index decile. There were statistically significantly more deaths in deciles 6–10, compared with decile 1 (**Figure 5.4**).

Figure 5.4: Suicide mortality (rates per 100,000 population) in children and young people aged 10–24 years by New Zealand Deprivation Index decile, Aotearoa/New Zealand 2002–17 (n=576 deaths*)



* Excludes one case where deprivation was unknown.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 10–24 years.

6. Transport mortality | Te takimate haere waka

The following chapter provides a broad overview of transport-related mortality in children and young people. Deaths in this chapter include those that occurred both on and off the road, by a variety of users. The numbers in this chapter need to be interpreted with caution, given that there is largely no information about exposure (for example, time spent walking or travelling in a car), which can influence mortality. This chapter includes all deaths related to transport, including those on and off the road, in pedestrians, cyclists, motor vehicles, and water and aircraft.

Key findings

- In the years 2002 to 2017 inclusive, there were 2,128 deaths in children and young people aged 28 days to 24 years due to transport.
- There were 481 deaths in the most recent five-year period, from 2013 to 2017.
- While the number of deaths has been consistent over the past five-year period, there has been a large reduction in deaths since 2002, with mortality reducing in the age groups 15–19 years and 20–24 years.
- Of all transport deaths, most were in car occupants (64.2 percent), with 12.9 percent in pedestrians and 7.1 percent in motorcyclists.
- Pedestrian deaths were in all ages, with peaks in those aged one to four years and 15–24 years.
- Car occupant mortality peaked in those aged 18 years.
- The highest mortality rates in cyclists were seen in those aged 10–14 years.
- In all cases, deaths in males far outnumbered those in females.
- Marked disparities were evident by prioritised ethnic group, particularly in car occupant and pedestrian deaths, with Māori having significantly higher rates than non-Māori non-Pacific children and young people.

In the years 2002 to 2017 inclusive, there were 2,128 deaths in children and young people aged 28 days to 24 years due to transport. There were 481 deaths in the most recent five-year period, from 2013 to 2017 (**Table 6.1**).

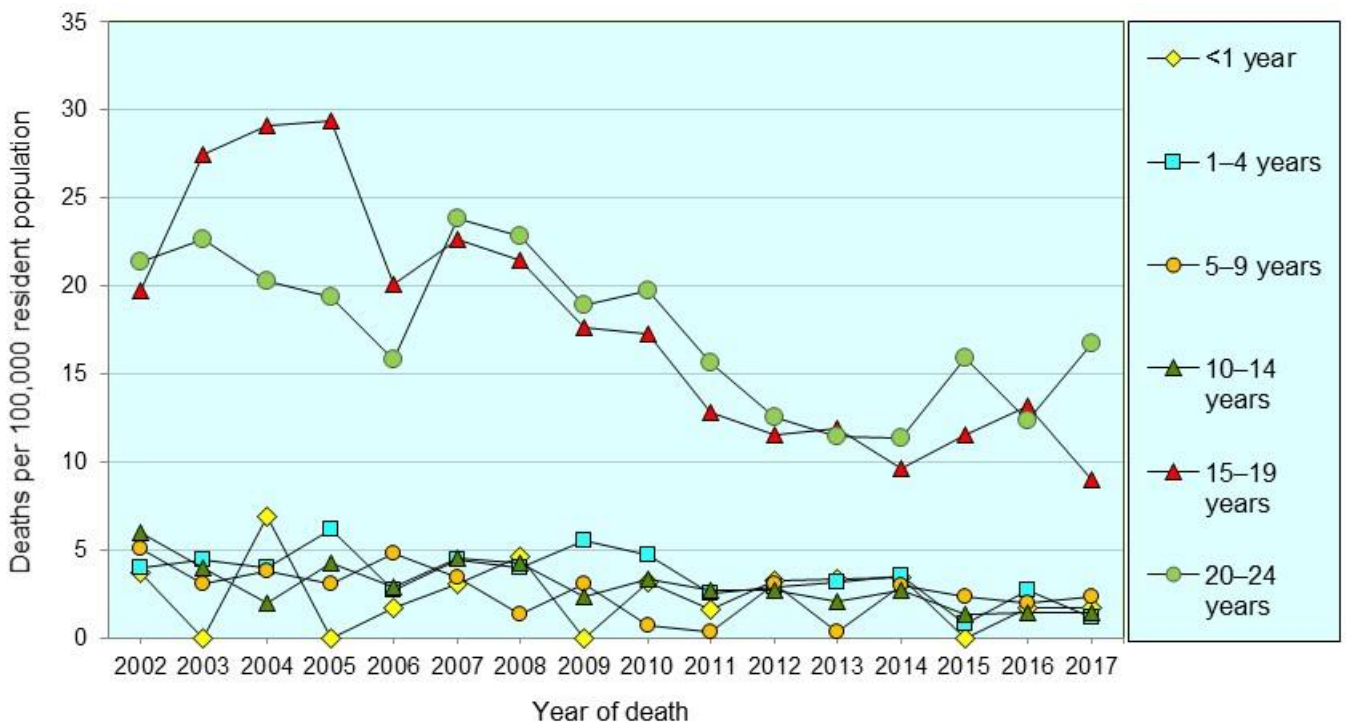
Table 6.1: Transport mortality (number of deaths and rates per 100,000 population) in children and young people aged 28 days to 24 years by age group and year of death, Aotearoa/New Zealand 2013–17 (n=481 deaths)

Category	2013	2014	2015	2016	2017	Total	Percentage (%)	Rate per 100,000
28 days–<1 year	<3	<3	<3	<3	<3	6	1.2	1.99
1–4 years	8	9	<3	7	4	29	6	2.24
5–9 years	<3	9	7	7	7	30	6.2	1.98
10–14 years	6	9	4	4	4	26	5.4	1.78
15–19 years	37	30	36	41	28	172	35.8	11.02
20–24 years	36	36	51	40	55	218	45.3	13.55
Total	90	94	100	99	98	481	100	6.21

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG age-specific Estimated Resident Population 2013–17, 0–24 years.

The number of deaths from transport has remained constant over the past five years, with between 90 and 100 deaths each year. Most deaths (81 percent) are in adolescents aged 15–24 years (Table 6.1). While the number of deaths has been consistent over the past five years, before this, there had been a large reduction in deaths since 2002, with mortality reducing in the age groups 15–19 years and 20–24 years (Figure 6.1).

Figure 6.1: Transport mortality (rates per 100,000 population) in children and young people aged 28 days to 24 years by age group and year of death, Aotearoa/New Zealand 2002–17 (n=2,128 deaths)



Sources: Numerator: Mortality Review Database; Denominator: NZMRDG age-specific Estimated Resident Population 2002–17, 0–24 years.

Of all transport deaths, the most were in car occupants (64.2 percent), with 12.9 percent in pedestrians and 7.1 percent in motorcyclists (Table 6.2).

Table 6.2: Transport mortality (number of deaths) in children and young people aged 28 days to 24 years by road user type and age group, Aotearoa/New Zealand 2002–17 combined (n=2,128 deaths)

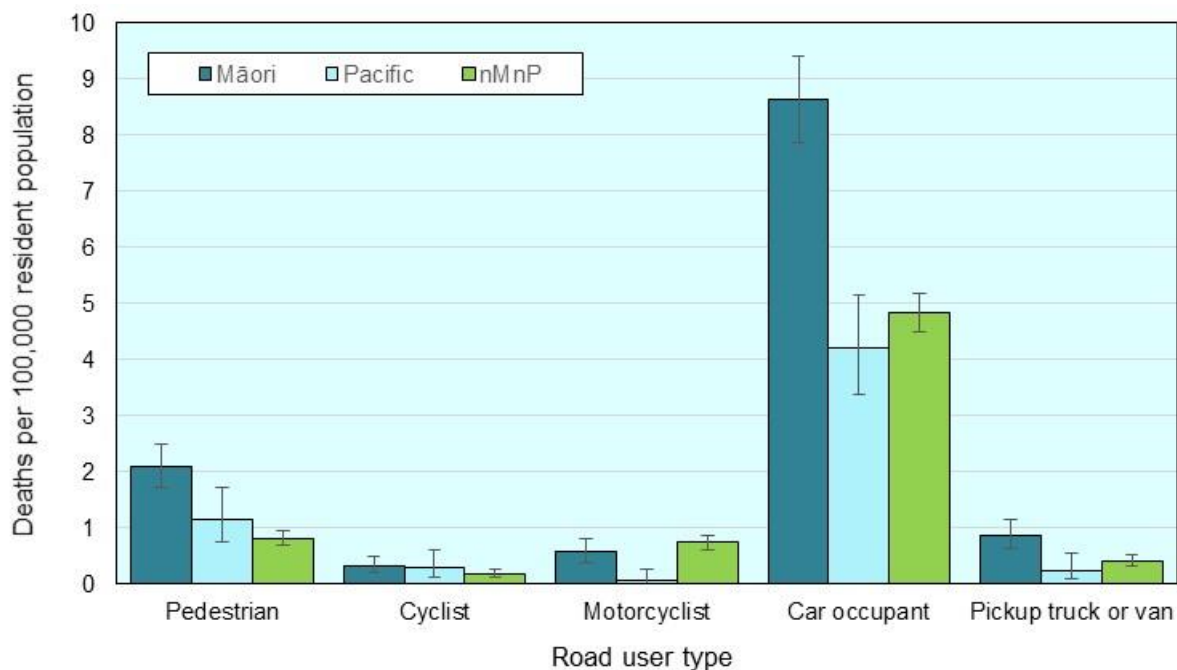
Category	<1 year*	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total	Percentage (%)
Pedestrian	5	71	33	25	70	70	274	12.9
Cyclist	<3	<3	10	20	11	8	51	2.4
Motorcyclist	<3	<3	3	12	57	78	151	7.1
Car occupant	16	50	45	58	638	560	1,367	64.2
Pickup truck or van	<3	5	7	9	46	50	119	5.6
Heavy transport vehicle	0	<3	<3	<3	10	9	24	1.1
Industrial/agricultural vehicle	0	<3	0	0	3	14	18	0.8
All-terrain vehicle	0	<3	9	9	17	8	45	2.1
Helicopter and aircraft	0	0	4	0	6	10	20	0.9
Watercraft	0	0	9	5	9	18	41	1.9
Other	0	0	0	4	3	4	11	0.5
Unspecified	0	0	<3	<3	<3	5	7	0.3
Total	23	133	123	144	871	834	2,128	100

* This category represents infants 28 days and older, and less than one calendar year in age.

Source: Mortality Review Database.

Mortality rates from transport deaths are substantially higher in car occupants than any other transport group. By broad ethnic category, mortality rates were statistically significantly higher in Māori, compared with other ethnic groups, for car occupants, pedestrians and pickup trucks and vans. Mortality rates for Pacific were similar to non-Pacific non-Māori for all transport groups except motorcyclists, where Pacific mortality was statistically significantly lower (**Figure 6.2** and **Figure 6.3**).

Figure 6.2: Transport mortality (rates per 100,000 population and 95 percent confidence intervals) in children and young people aged 28 days to 24 years by road user type (five most common types) and prioritised ethnic category, Aotearoa/New Zealand 2002–17 combined (n=1,957 deaths*)

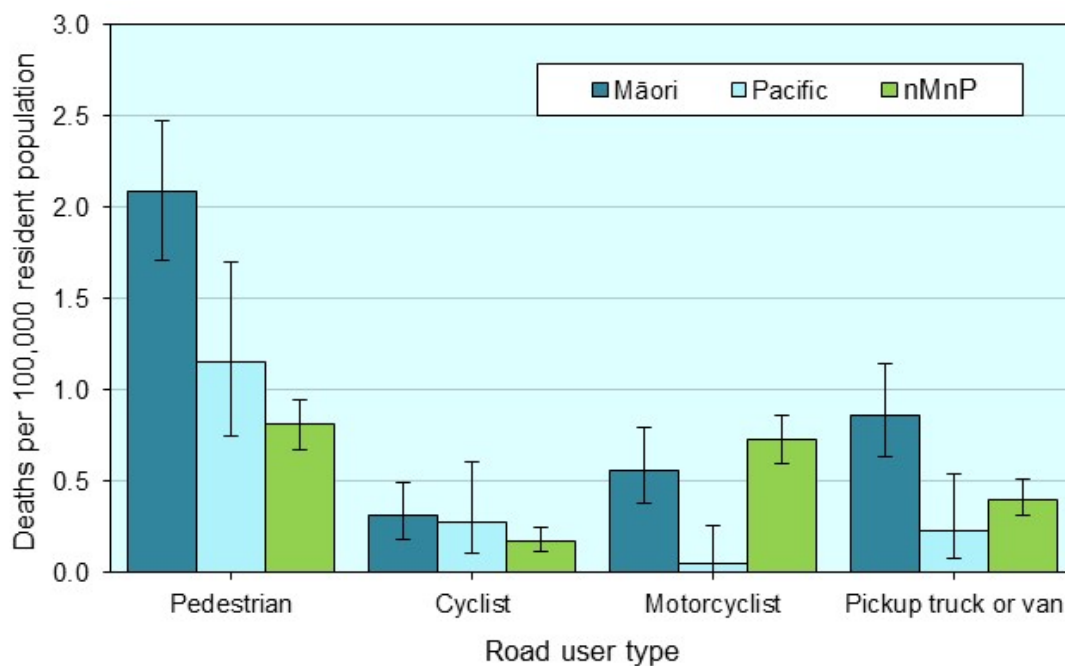


* Excludes five cases with unknown ethnicity.

nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2002–17, 0–24 years.

Figure 6.3: Transport mortality (rates per 100,000 population and 95 percent confidence intervals) in children and young people aged 28 days to 24 years by road user type (five most common types, excluding car occupants) and prioritised ethnic category, Aotearoa/New Zealand 2002–17 combined (n=595 deaths)



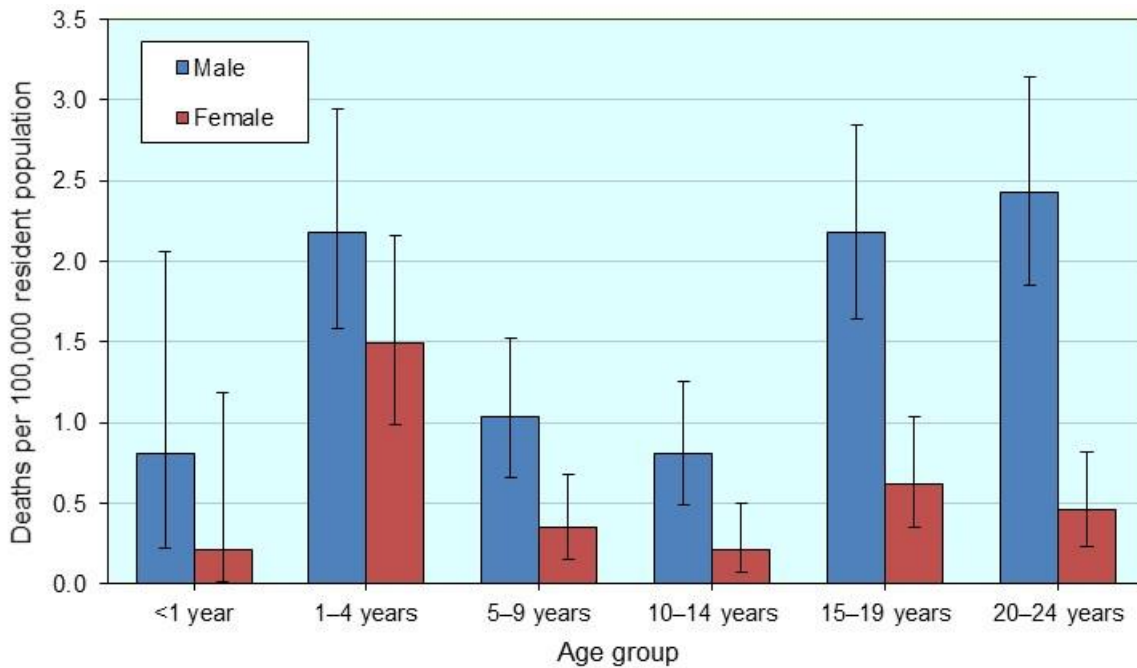
nMnP = non-Māori non-Pacific.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2002–17, 0–24 years.

Pedestrians

Mortality rates in pedestrians varied considerably by age group, with rates highest in those aged one to four years and 15–24 years. For every age group, the mortality rate was higher in males than females. This was statistically significant from five years of age upwards (**Figure 6.4**).¹³

Figure 6.4: Pedestrian mortality (rates per 100,000 population and 95 percent confidence intervals) in children and young people aged 28 days to 24 years by sex and age group, Aotearoa/New Zealand 2002–17 combined (n=274 deaths)



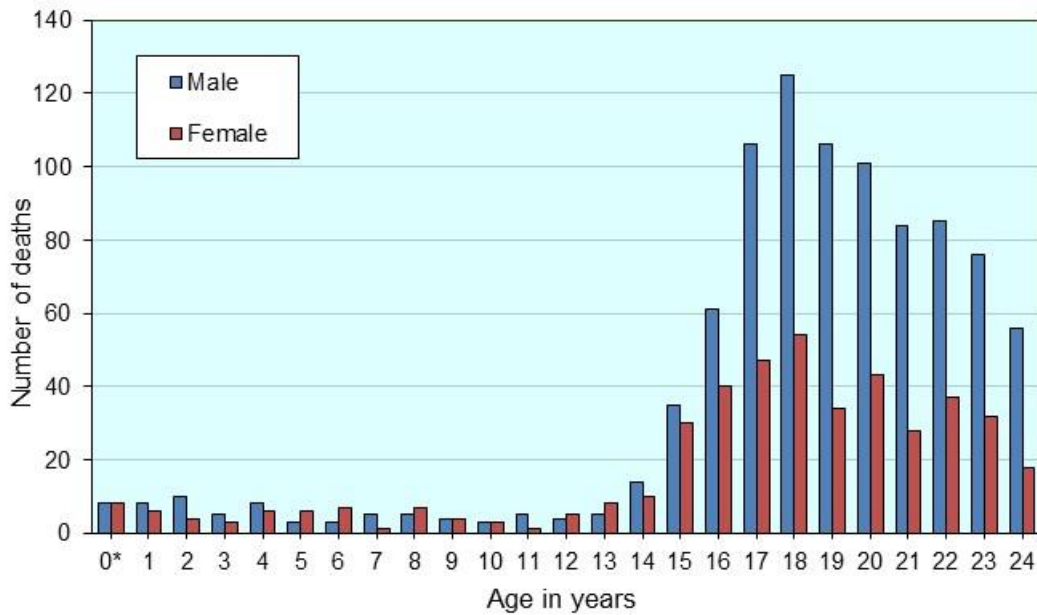
Sources: Numerator: Mortality Review Database; Denominator: <1 year: Ministry of Health Live Birth Registrations 2002–16, NZMRDG 2017; 1–24 years: NZMRDG age-specific Estimated Resident Population 2002–17.

¹³ The male:female rate ratio for the age group five to nine years was 2.98, 95 percent CI 1.34–6.60; for the age group 10–14 years, the rate ratio was 3.80, 95 percent CI 1.43–10.12.

Car occupants

Over the 16 years from 2002 to 2017, there were 1,370 deaths in car occupants. Most deaths occurred in adolescents, with numbers increasing steeply around 17 years of age. While the number of deaths in both males and females increased at a similar age, the predominance was for male deaths, which was particularly evident from age 17 years (**Figure 6.5**).

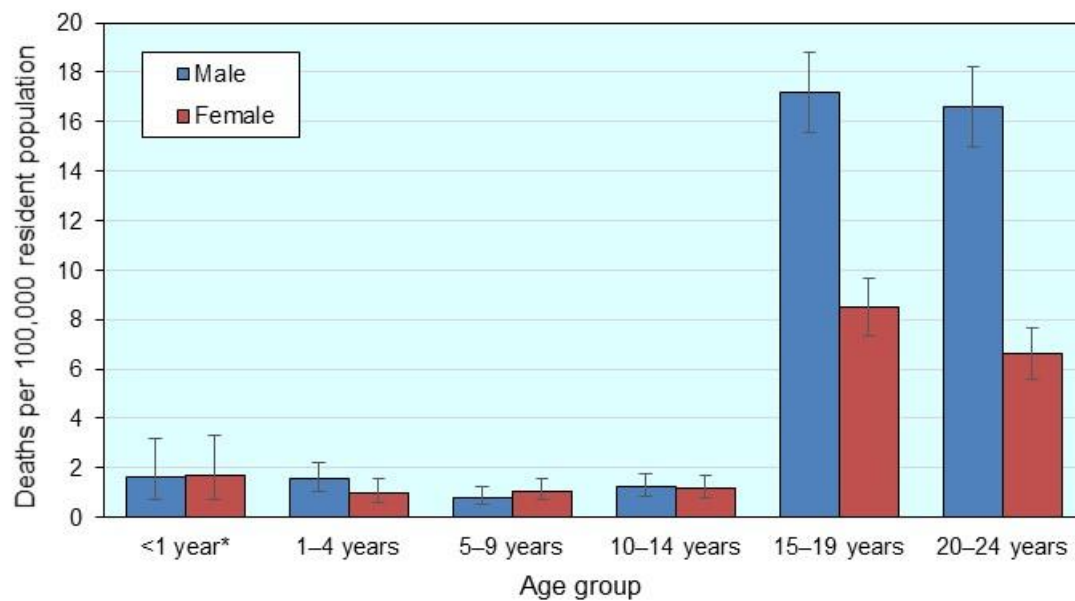
Figure 6.5: Car occupant mortality (number of deaths) in children and young people aged 28 days to 24 years by sex and age, Aotearoa/New Zealand 2002–17 combined (n=1,367 deaths)



* Indicates 28 days to less than one calendar year.
Source: Mortality Review Database.

As well as the number of deaths being higher in adolescents and males, this was also true for the mortality rate. **Figure 6.6** shows that mortality rates in car occupants are statistically significantly higher in adolescents aged 15–19 years. Mortality rates are similar by sex in children under the age of 15 years; however, in those aged 15–19 years and 20–24 years, the mortality rate in males was statistically significantly higher.

Figure 6.6: Car occupant mortality (rates per 100,000 population and 95 percent confidence intervals) in children and young people aged 28 days to 24 years by sex and age group, Aotearoa/New Zealand 2002–17 combined (n=1,367 deaths)



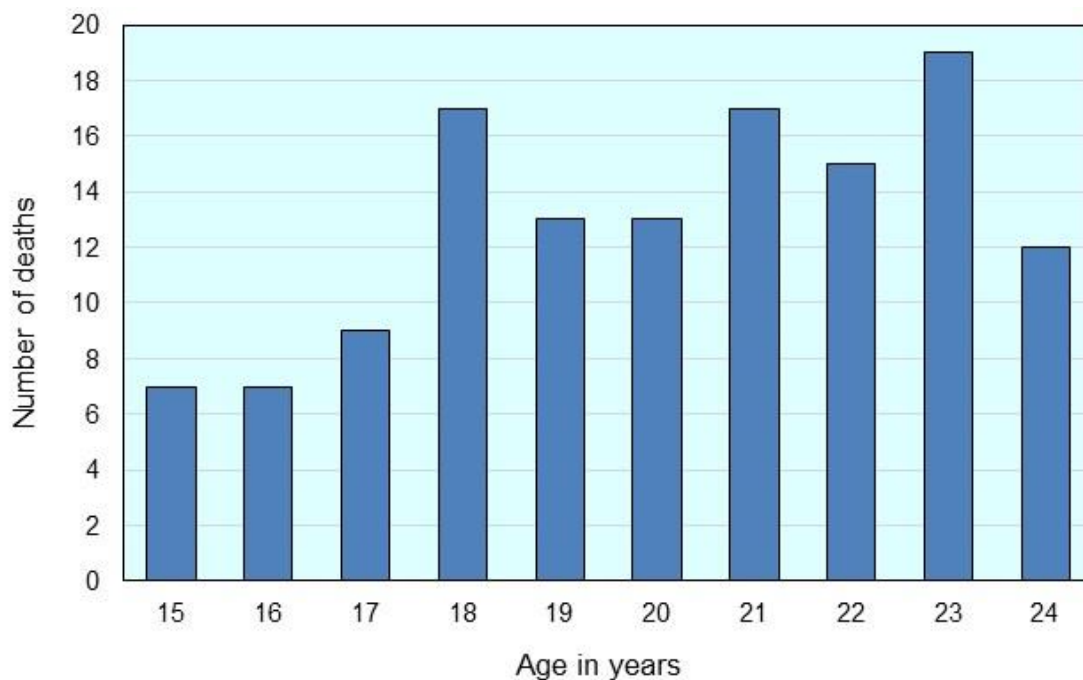
* Indicates 28 days to less than one calendar year.

Sources: Numerator: Mortality Review Database; Denominator: <1 year: Ministry of Health Live Birth Registrations 2002–16, NZMRDG 2017; 1–24 years: NZMRDG age-specific Estimated Resident Population 2002–17.

Motorcyclists

During the 2002–17 study period, there were 151 deaths in motorcyclists. Of these deaths, 141 (93 percent) were males. As with car occupants, a large increase occurred in the number of deaths from around age 18 years (**Figure 6.7**).

Figure 6.7: Motorcyclist mortality (number of deaths) in children and young people aged 15–24 years by sex and age, Aotearoa/New Zealand 2002–17 combined (n=129 deaths*)



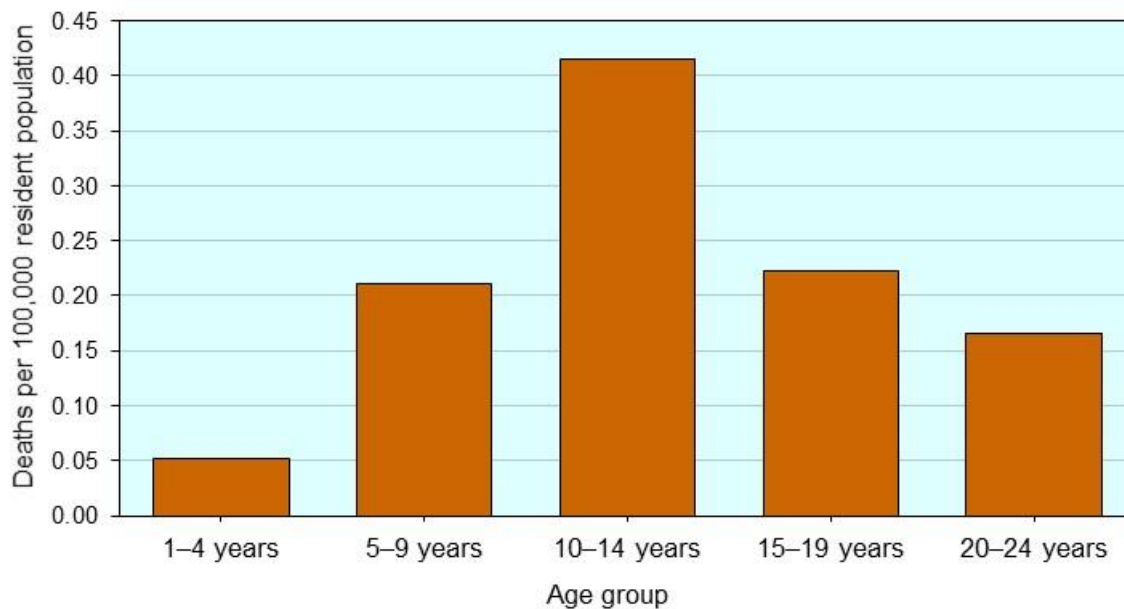
* Ten females were excluded from the figure, as were 12 males under the age of 15 years.

Source: Mortality Review Database.

Cyclists

During 2002–17, there were 51 cyclist deaths. Of these, 40 were in males and 11 were in females. The highest mortality rate was in those aged 10–14 years (**Figure 6.8**).

Figure 6.8: Pedal cyclist mortality (rates per 100,000 population) in children and young people aged 1–24 years by age group, Aotearoa/New Zealand 2002–17 combined (n=51 deaths)



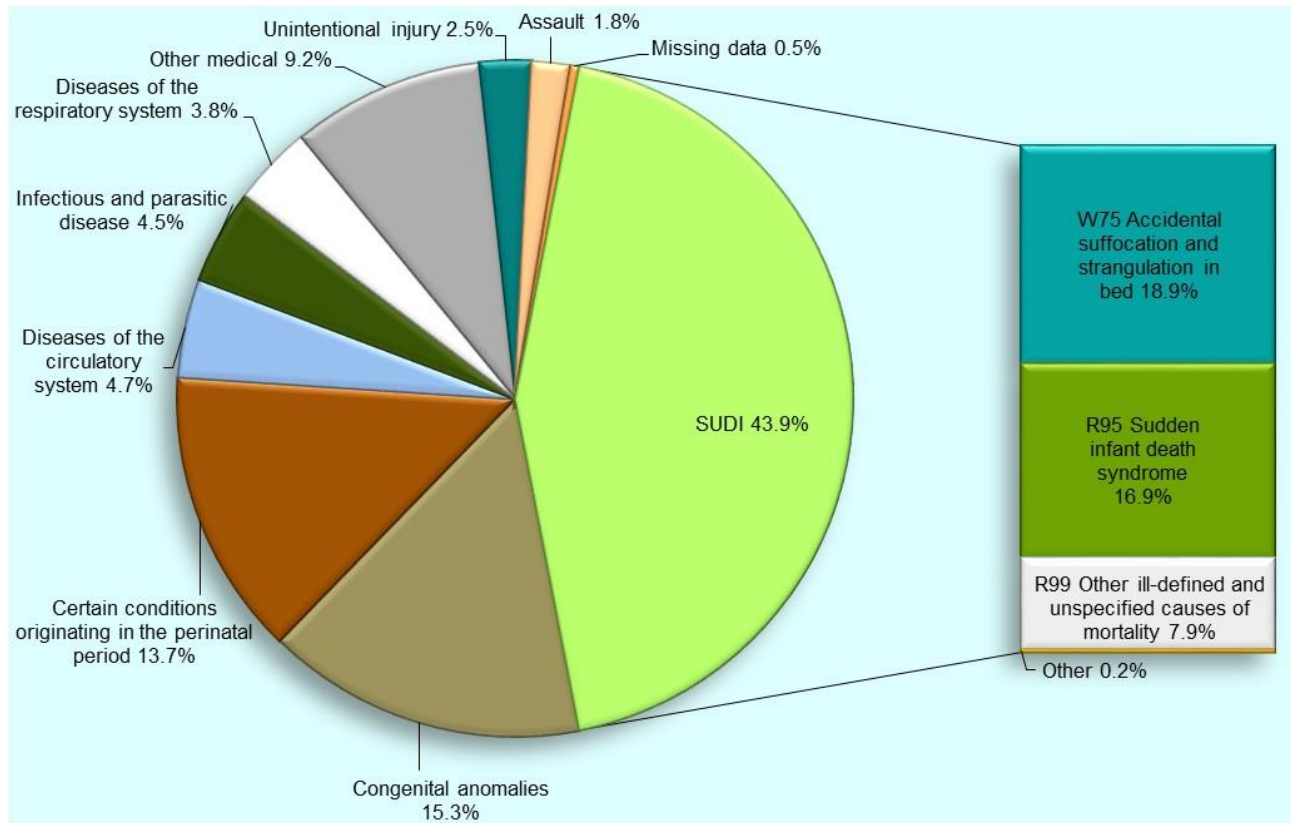
Note: There were no pedal cyclist deaths in post-neonatal infants (28 days to one year).

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG age-specific Estimated Resident Population 2013–17, 1–24 years.

Appendices | Ngā āpiti hanga

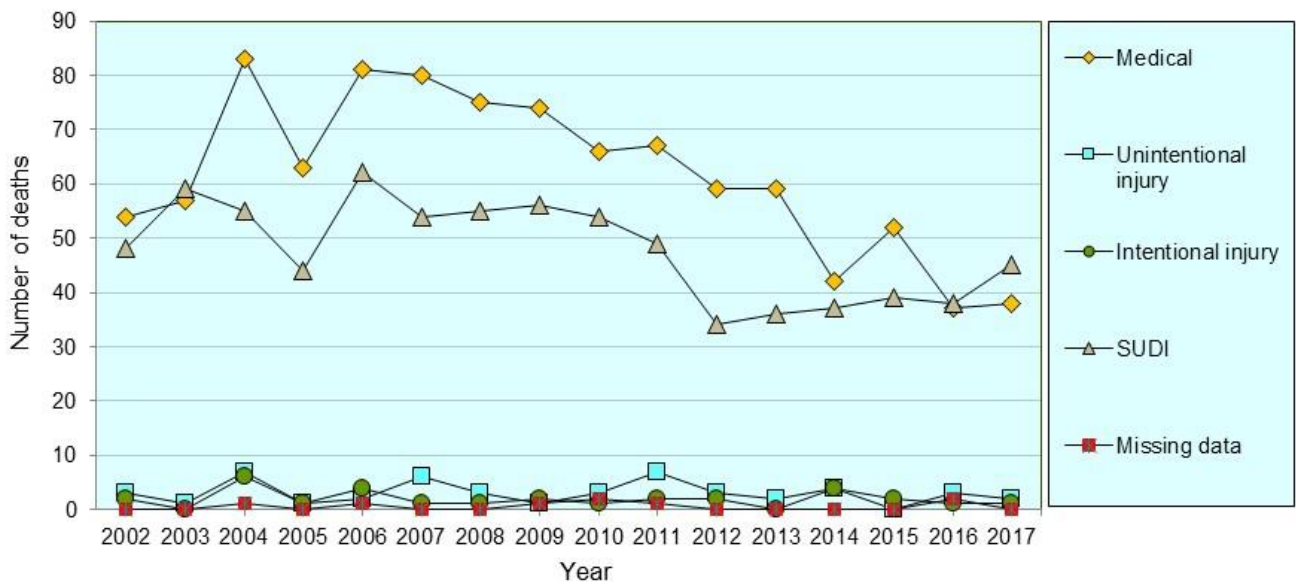
7. Post-neonatal infants: 28 days to less than one year

Figure 7.1: Post-neonatal infant mortality (%) by cause of death, Aotearoa/New Zealand 2013–17 combined (n=444 deaths)



Source: Mortality Review Database.

Figure 7.2: Post-neonatal infant mortality (number of deaths) by cause and year of death, Aotearoa/New Zealand 2002–17 (n=1,838 deaths)



Source: Mortality Review Database.

Table 7.1: Post-neonatal infant mortality (number deaths and rates per 1,000 live births) by cause and year of death, Aotearoa/New Zealand 2013–17 (n=444 deaths)

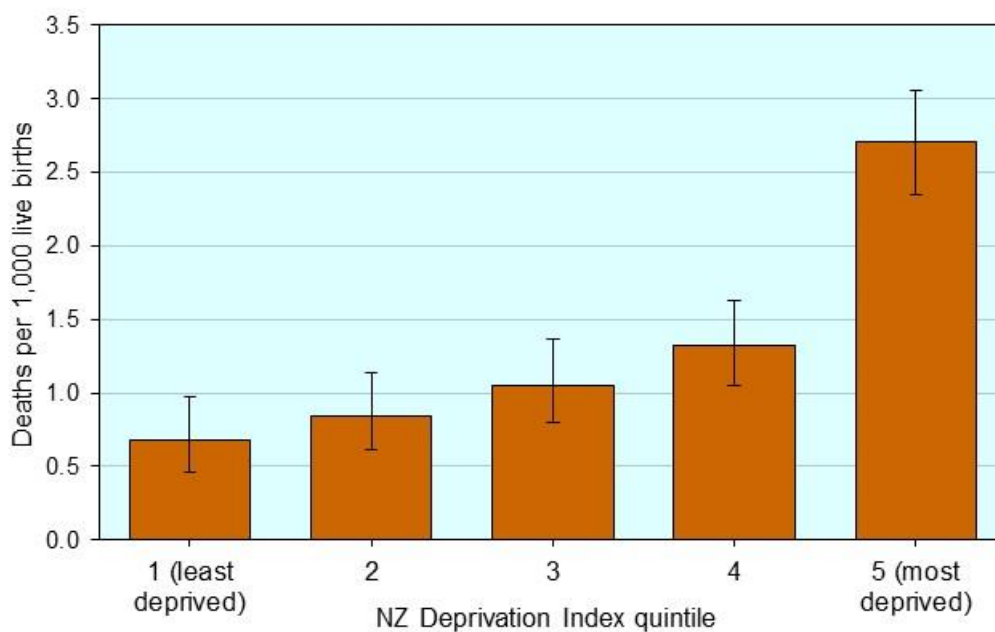
Cause of death	2013	2014	2015	2016	2017	Total	%	Rate 2013–17
Medical								
Infectious and parasitic disease	7	5	4	<3	4	20	4.5	0.07
Neoplasms	3	<3	4	<3	0	11	2.48	0.04
Diseases of the blood and blood-forming organs and disorders of the immune system	<3	<3	<3	<3	0	6	1.35	0.02
Endocrine, nutritional and metabolic diseases	<3	<3	<3	<3	0	7	1.58	0.02
Mental and behavioural disorders	0	0	0	0	0	0	0	0
Diseases of the nervous system	3	<3	3	<3	3	12	2.7	0.04
Diseases of the ear and mastoid process	0	0	0	0	<3	<3	x	s
Diseases of the circulatory system	4	5	<3	<3	9	21	4.73	0.07
Diseases of the respiratory system	4	6	4	<3	<3	17	3.83	0.06
Diseases of the digestive system	<3	0	<3	<3	0	4	0.9	0.01
Diseases of the skin and subcutaneous tissue	0	0	0	0	0	0	0	0
Diseases of the musculoskeletal system and connective tissue	0	0	0	0	0	0	0	0
Diseases of the genitourinary system	0	0	0	0	0	0	0	0
Pregnancy, childbirth and the puerperium	0	0	0	0	0	0	0	0
Certain conditions originating in the perinatal period	19	10	11	12	9	61	13.74	0.2
Congenital anomalies	14	8	21	13	12	68	15.32	0.23
Symptoms and abnormal findings not elsewhere classified	0	0	0	0	<3	<3	x	s
Total medical	59	42	52	37	38	228	51.35	0.76
Unintentional injury (includes undetermined intent and legal intervention/war)								
Cut/pierce	0	0	0	0	0	0	0	0
Drowning	0	<3	<3	<3	0	<3	x	s
Fall	0	0	0	0	0	0	0	0
Fire/hot object or substance	0	0	0	0	<3	<3	x	s
Firearm	0	0	0	0	0	0	0	0
Machinery	0	0	0	0	0	0	0	0
Transport	<3	<3	0	<3	<3	6	1.35	0.02
Natural/environmental	0	0	0	0	0	0	0	0
Poisoning	0	0	0	0	0	0	0	0
Struck by, against	0	0	0	0	0	0	0	0
Suffocation	0	0	0	0	0	0	0	0
Other specified, classifiable	0	0	0	<3	0	<3	x	s
Other specified, not elsewhere classified	0	0	0	0	0	0	0	0
Unspecified	0	<3	0	0	0	<3	x	s
Complications of medical and surgical care	0	0	0	0	0	0	0	0
Sequelae of surgical and medical care as external cause	0	0	0	0	0	0	0	0
Total unintentional injury	<3	4	0	3	<3	11	2.48	0.04
Intentional injury								
Assault	0	4	<3	<3	<3	8	1.8	0.03
Total intentional injury	0	4	<3	<3	<3	8	1.8	0.03
SUDI								
R95 Sudden infant death syndrome	18	11	15	15	16	75	16.89	0.25
R96 Other sudden death, cause unknown	0	0	0	0	0	0	0	0
R98 Unattended death	0	0	0	0	0	0	0	0
R99 Other ill-defined and unspecified causes of mortality	<3	<3	3	9	21	35	7.88	0.12
W75 Accidental suffocation and strangulation in bed	16	26	20	14	8	84	18.92	0.28
W78 Inhalation of gastric contents	0	0	<3	0	0	<3	x	s
W79 Inhalation and ingestion of food causing obstruction of respiratory tract	0	0	0	0	0	0	0	0
Total SUDI	36	37	39	38	45	195	43.92	0.65
Missing data	0	0	0	<3	0	<3	x	s
Total	97	87	93	81	86	444	100	1.48

'x' indicates percent not calculated due to small numbers.

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2013–16, NZMRDG 2017.

Figure 7.3: Post-neonatal infant mortality (rates per 1,000 live births and 95 percent confidence intervals) by NZ Deprivation Index quintile, Aotearoa/New Zealand 2013–17 combined (n=442 deaths*)

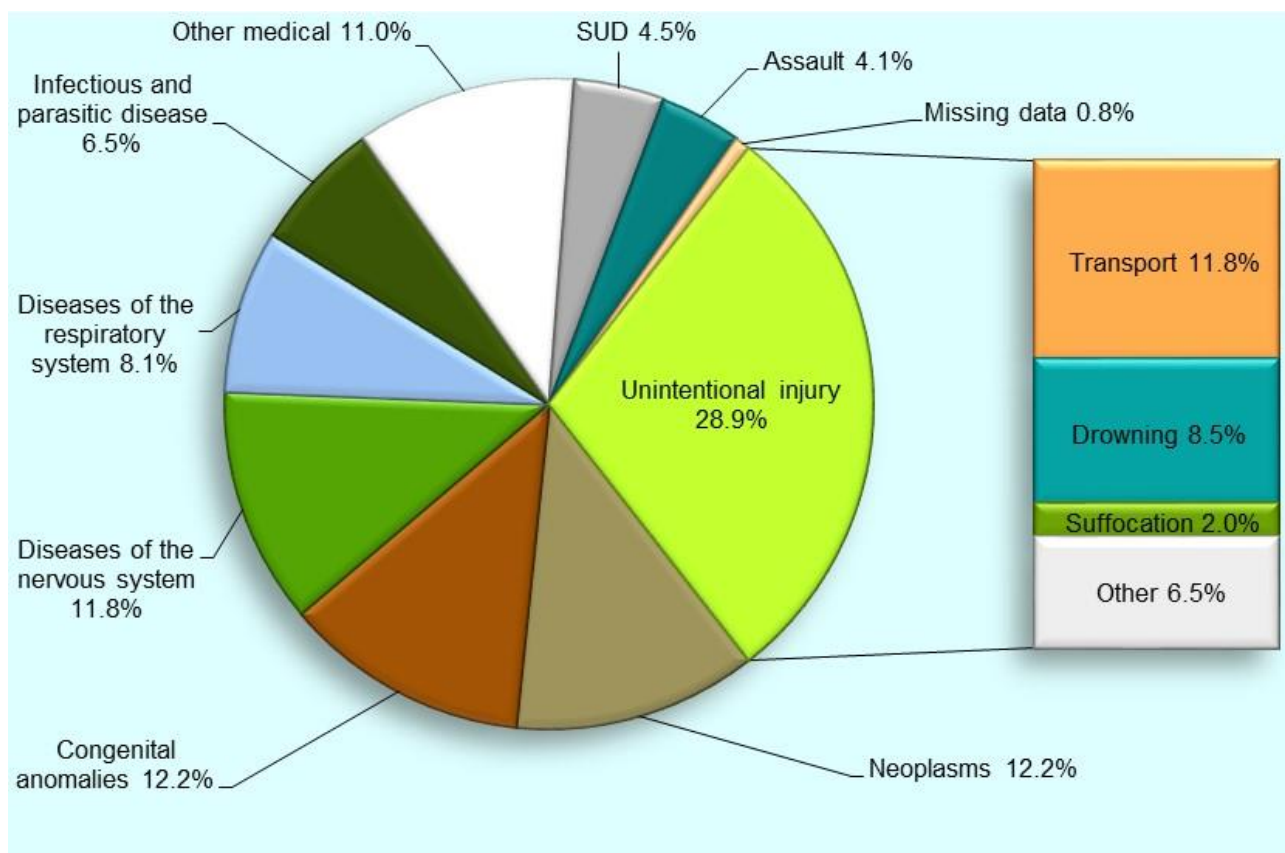


* Excludes two cases with no available deprivation data.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2013–16, NZMRDG 2017.

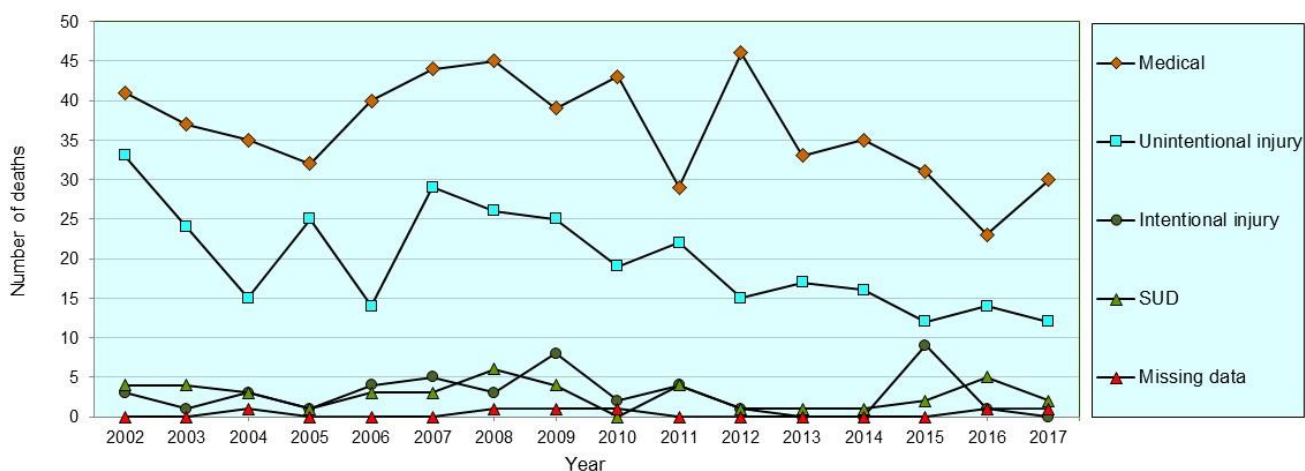
8. Children aged one to four years

Figure 8.1: Mortality (%) in children aged one to four years by cause of death, Aotearoa/New Zealand 2013–17 combined (n=246 deaths)



Source: Mortality Review Database.

Figure 8.2: Mortality (number of deaths) in children aged one to four years by cause and year of death, Aotearoa/New Zealand 2002–17 (n=996 deaths)



Source: Mortality Review Database.

Table 8.1: Mortality (number of deaths and rates per 100,000 population) in children aged one to four years by cause and year of death, Aotearoa/New Zealand 2013–17 (n=246 deaths)

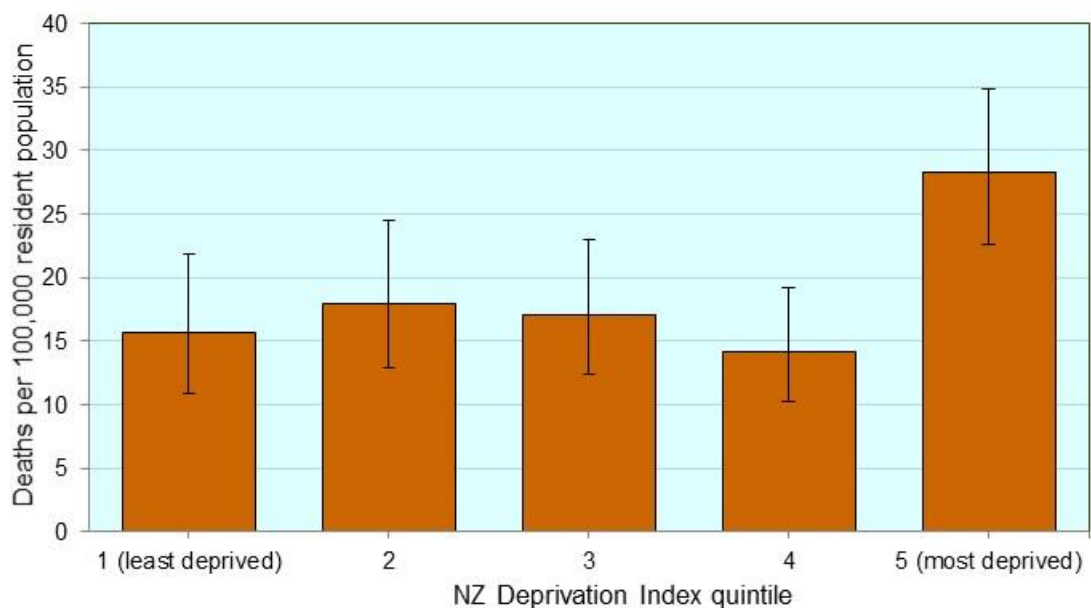
Cause of death	2013	2014	2015	2016	2017	Total	%	Rate 2013–17
Medical								
Infectious and parasitic disease	4	7	<3	<3	4	16	6.5	1.23
Neoplasms	6	5	7	5	7	30	12.2	2.32
Diseases of the blood and blood-forming organs and disorders of the immune system	0	<3	0	0	0	<3	x	s
Endocrine, nutritional and metabolic diseases	<3	<3	3	0	0	6	2.4	0.46
Mental and behavioural disorders	0	<3	0	0	0	<3	x	s
Diseases of the nervous system	9	3	4	6	7	29	11.8	2.24
Diseases of the circulatory system	<3	<3	<3	<3	3	9	3.7	0.69
Diseases of the respiratory system	4	6	5	4	<3	20	8.1	1.54
Diseases of the digestive system	0	<3	<3	<3	0	<3	x	s
Certain conditions originating in the perinatal period	<3	<3	0	0	0	<3	x	s
Congenital anomalies	5	7	7	4	7	30	12.2	2.31
Symptoms and abnormal findings not elsewhere classified	<3	<3	<3	0	<3	7	2.9	0.54
Total medical	33	35	31	23	30	152	61.8	11.71
Unintentional injury (includes undetermined intent and legal intervention/war)								
Drowning	5	4	3	<3	7	21	8.5	1.62
Fall	<3	0	0	0	<3	3	1.2	0.23
Fire/hot object or substance	0	<3	0	0	0	<3	x	s
Machinery	<3	0	0	0	0	<3	x	s
Transport	8	9	<3	7	3	29	11.8	2.24
Natural/environmental	<3	0	<3	<3	0	3	1.2	0.23
Poisoning	0	0	<3	<3	0	<3	x	s
Struck by, against	0	0	<3	<3	0	3	1.2	0.23
Suffocation	<3	<3	<3	3	0	5	2.0	0.39
Unspecified	<3	<3	<3	<3	0	3	1.2	0.23
Total unintentional injury	17	16	12	14	12	71	28.9	5.47
Intentional injury								
Assault	0	0	9	<3	<3	10	4.1	0.77
Total intentional injury	0	0	9	<3	<3	10	4.1	0.77
SUD (1 year to 23 months)								
R95 Sudden infant death syndrome	0	0	0	0	0	0	–	–
R96 Other sudden death, cause unknown	0	0	0	0	0	0	–	–
R98 Unattended death	0	0	0	0	0	0	–	–
R99 Other ill-defined and unspecified causes of mortality	0	<3	<3	5	<3	9	3.7	0.69
W75 Accidental suffocation and strangulation in bed	<3	<3	<3	0	0	<3	x	s
W78 Inhalation of gastric contents	0	0	0	0	0	0	–	–
W79 Inhalation and ingestion of food causing obstruction of respiratory tract	0	0	0	0	0	0	–	–
Total SUD	<3	<3	<3	5	<3	11	4.5	0.85
Missing data	0	0	0	<3	<3	<3	x	s
Total	51	52	54	44	45	246	100.0	18.95

'x' indicates percent not calculated due to small numbers.

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, one to four years.

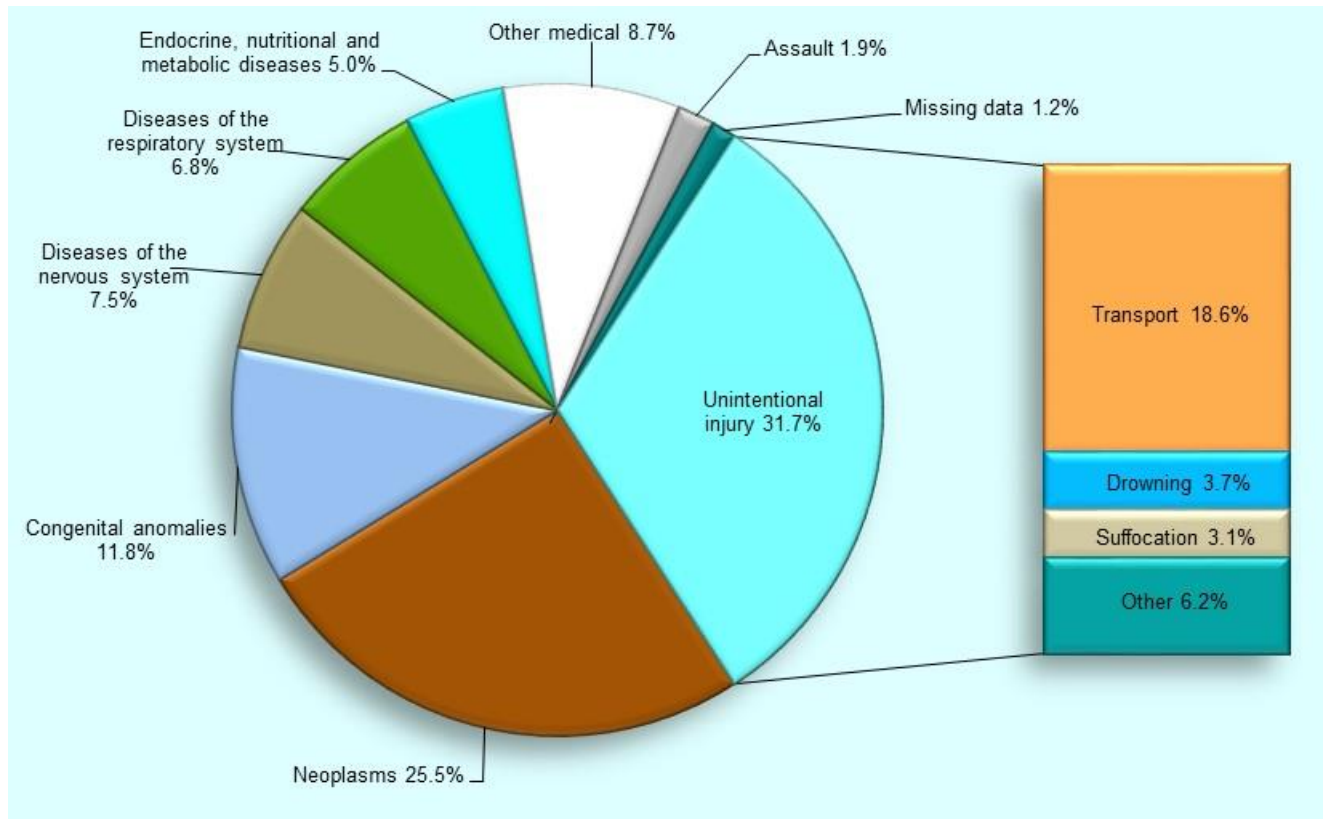
Figure 8.3: Mortality (rates per 100,000 population with 95 percent confidence intervals) in children aged one to four years by NZ Deprivation Index quintile, Aotearoa/New Zealand 2013–17 combined (n=246 deaths)



Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, one to four years.

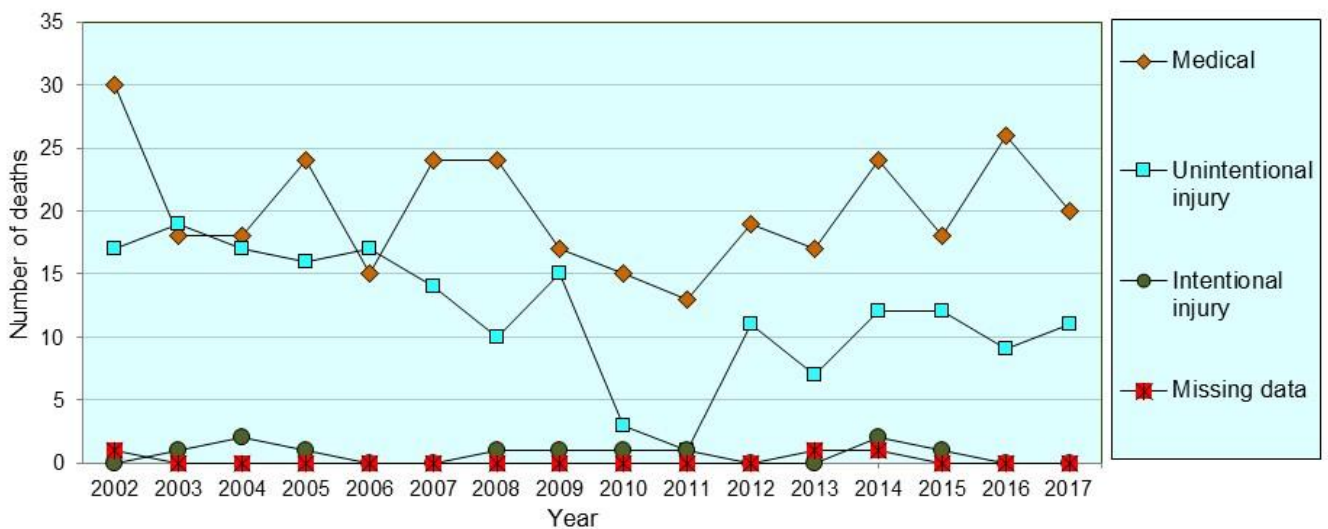
9. Children aged five to nine years

Figure 9.1: Mortality (%) in children aged five to nine years by cause of death, Aotearoa/New Zealand 2013–17 combined (n=161 deaths)



Source: Mortality Review Database.

Figure 9.2: Mortality (number of deaths) in children aged five to nine years by cause and year of death, Aotearoa/New Zealand 2002–17 (n=527 deaths)



Source: Mortality Review Database.

Table 9.1: Mortality (number of deaths and rates per 100,000 population) in children aged five to nine years by cause and year of death, Aotearoa/New Zealand 2013–17 (n=161 deaths)

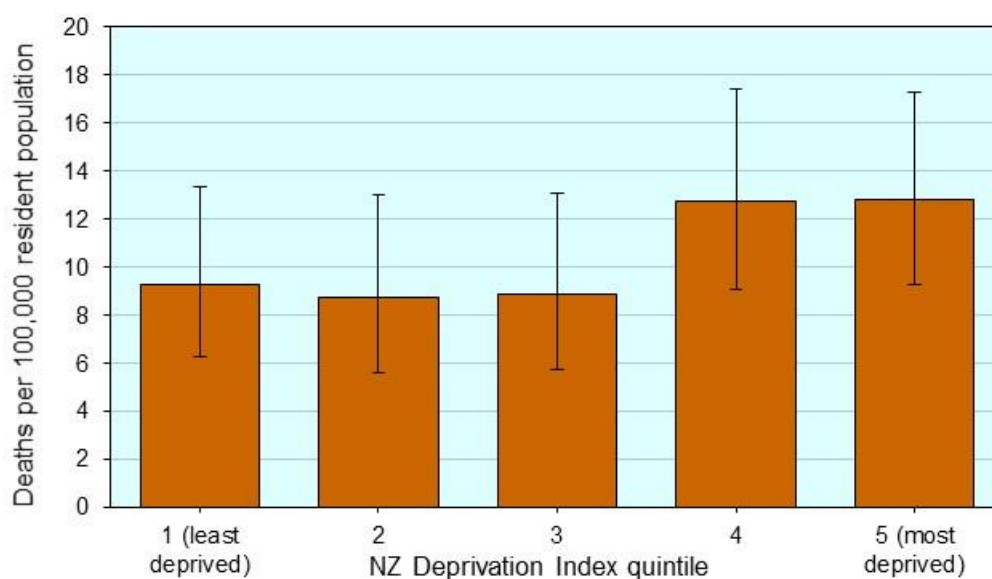
Cause of death	2013	2014	2015	2016	2017	Total	%	Rate 2013–17
Medical								
Infectious and parasitic disease	<3	0	<3	<3	<3	3	1.86	0.2
Neoplasms	4	13	7	11	6	41	25.47	2.71
Diseases of the blood and blood-forming organs and disorders of the immune system	<3	<3	<3	0	0	<3	x	s
Endocrine, nutritional and metabolic diseases	<3	3	<3	<3	<3	8	4.97	0.53
Mental and behavioural disorders	0	0	0	0	0	0	0	0
Diseases of the nervous system	5	<3	<3	3	<3	12	7.45	0.79
Diseases of the circulatory system	<3	0	0	<3	<3	4	2.48	0.26
Diseases of the respiratory system	<3	<3	4	<3	3	11	6.83	0.73
Diseases of the digestive system	0	<3	<3	<3	0	<3	x	s
Diseases of the skin and subcutaneous tissue	0	0	0	0	0	0	0	0
Diseases of the musculoskeletal system and connective tissue	0	0	0	0	0	0	0	0
Diseases of the genitourinary system	<3	0	0	0	0	<3	x	s
Pregnancy, childbirth and the puerperium	0	0	0	0	0	0	0	0
Certain conditions originating in the perinatal period	0	0	0	0	<3	<3	x	s
Congenital anomalies	<3	4	5	4	6	19	11.8	1.26
Symptoms and abnormal findings not elsewhere classified	0	0	0	<3	0	<3	x	s
Total medical	17	24	18	26	20	105	65.22	6.94
Unintentional injury (includes undetermined intent and legal intervention/war)								
Cut/pierce	0	0	0	0	0	0	0	0
Drowning	<3	<3	0	<3	<3	6	3.73	0.4
Fall	0	<3	0	<3	<3	<3	x	s
Fire/hot object or substance	<3	0	<3	<3	0	4	2.48	0.26
Firearm	0	0	0	0	0	0	0	0
Machinery	0	0	0	0	0	0	0	0
Transport	<3	9	7	6	7	30	18.63	1.98
Natural/environmental	<3	0	0	0	0	<3	x	s
Poisoning	0	0	<3	0	0	<3	x	s
Struck by, against	<3	0	0	0	0	<3	x	s
Suffocation	<3	<3	<3	0	<3	5	3.11	0.33
Other specified, classifiable	0	<3	0	0	<3	<3	x	s
Other specified, not elsewhere classified	0	0	0	0	0	0	0	0
Unspecified	0	0	0	0	0	0	0	0
Complications of medical and surgical care	0	0	0	0	0	0	0	0
Sequelae of surgical and medical care as external cause	0	0	0	0	0	0	0	0
Total unintentional injury	7	12	12	9	11	51	31.68	3.37
Intentional injury								
Assault	0	<3	<3	0	0	3	1.86	0.2
Suicide	0	0	0	0	0	0	0	0
Total intentional injury	0	<3	<3	0	0	3	1.86	0.2
Missing data	<3	<3	0	0	<3	<3	1.24	0.13
Total	25	39	31	35	31	161	100	10.65

'x' indicates percent not calculated due to small numbers.

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, five to nine years.

Figure 9.3: Mortality (rates per 100,000 population with 95 percent confidence intervals) in children aged five to nine years by NZ Deprivation Index quintile, Aotearoa/New Zealand 2013–17 combined (n=160 deaths*)

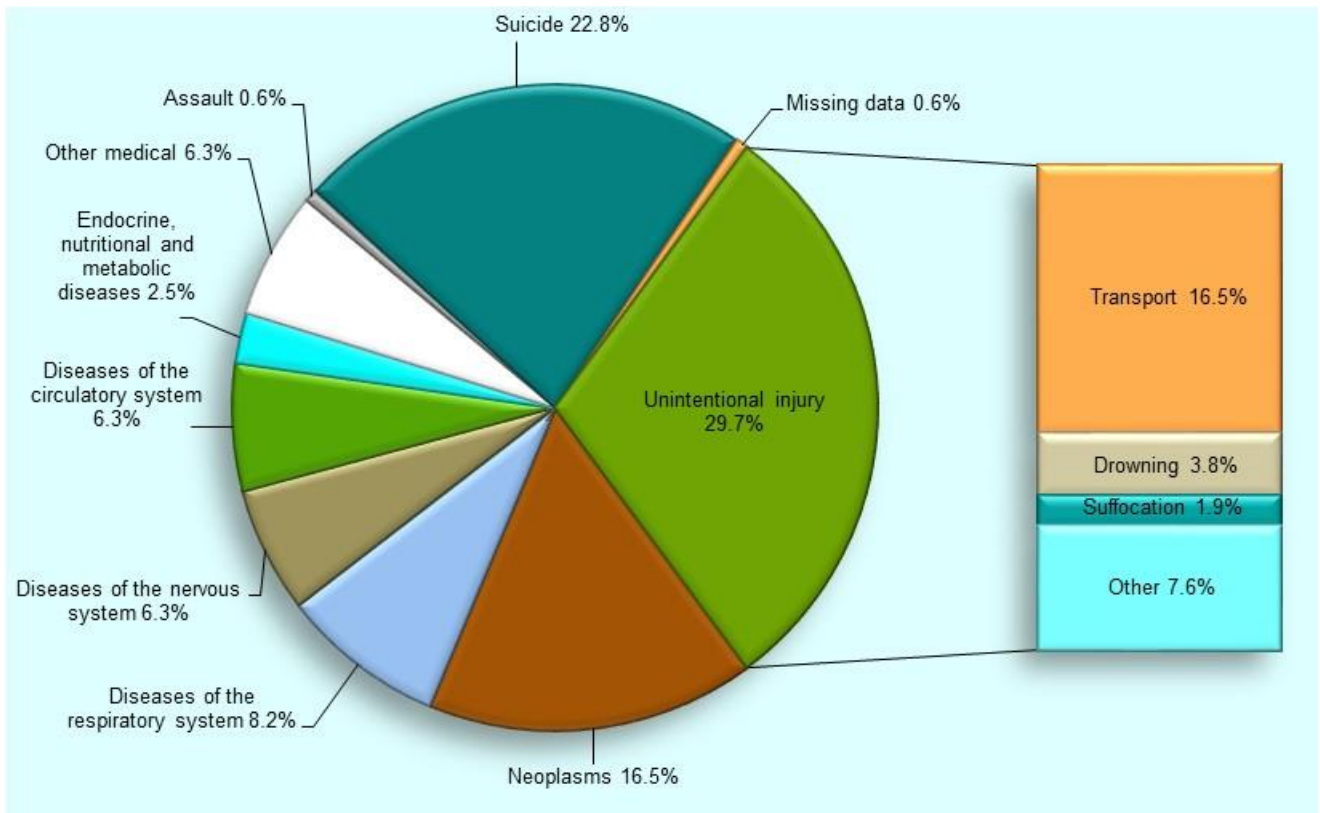


* Excludes one case with no available deprivation data.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, five to nine years.

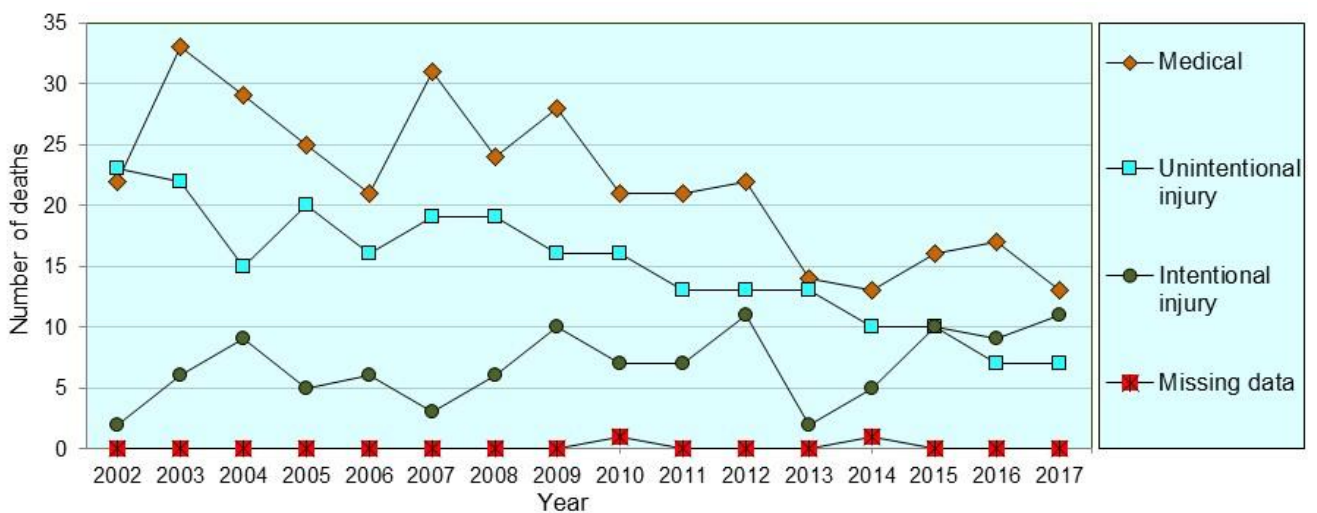
10. Children aged 10–14 years

Figure 10.1: Mortality (%) in children aged 10–14 years by cause of death, Aotearoa/New Zealand 2013–17 combined (n=158 deaths)



Source: Mortality Review Database.

Figure 10.2: Mortality (number of deaths) in children aged 10–14 years by cause and year of death, Aotearoa/New Zealand 2002–17 (n=700 deaths)



Source: Mortality Review Database.

Table 10.1: Mortality (number of deaths and rates per 100,000 population) in children aged 10–14 years by cause and year of death, Aotearoa/New Zealand 2013–17 (n=158 deaths)

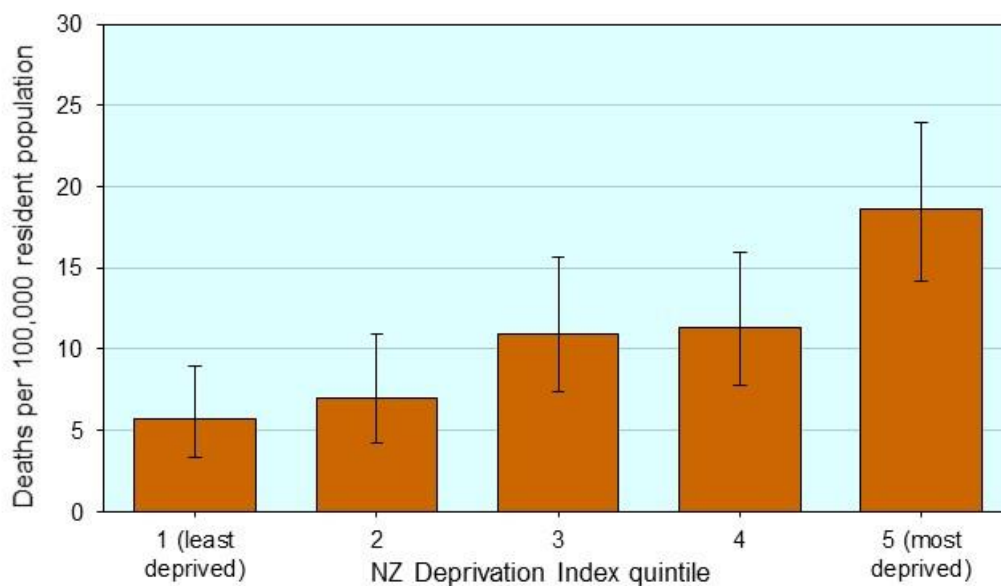
Cause of death	2013	2014	2015	2016	2017	Total	%	Rate 2013–17
Medical								
Infectious and parasitic disease	<3	0	0	0	0	<3	x	s
Neoplasms	5	6	6	5	4	26	16.46	1.78
Diseases of the blood and blood-forming organs and disorders of the immune system	0	0	0	0	0	0	0	0
Endocrine, nutritional and metabolic diseases	0	<3	<3	0	<3	4	2.53	0.27
Mental and behavioural disorders	0	0	0	<3	0	<3	x	s
Diseases of the nervous system	<3	<3	3	<3	<3	10	6.33	0.68
Diseases of the circulatory system	<3	<3	<3	3	<3	10	6.33	0.68
Diseases of the respiratory system	4	<3	<3	4	<3	13	8.23	0.89
Diseases of the digestive system	<3	0	0	<3	<3	<3	x	s
Diseases of the skin and subcutaneous tissue	0	0	0	0	0	0	0	0
Diseases of the musculoskeletal system and connective tissue	0	<3	<3	<3	0	<3	x	s
Diseases of the genitourinary system	0	0	0	0	0	0	0	0
Pregnancy, childbirth and the puerperium	0	0	0	0	0	0	0	0
Certain conditions originating in the perinatal period	0	0	0	0	0	0	0	0
Congenital anomalies	0	<3	<3	<3	<3	3	1.9	0.2
Symptoms and abnormal findings not elsewhere classified	0	<3	0	0	0	<3	x	s
Total medical	14	13	16	17	13	73	46.2	4.99
Unintentional injury (includes undetermined intent and legal intervention/war)								
Cut/pierce	0	0	0	0	0	0	0	0
Drowning	<3	0	<3	3	0	6	3.8	0.41
Fall	0	0	<3	0	0	<3	x	s
Fire/hot object or substance	<3	0	0	0	0	<3	x	s
Firearm	0	<3	<3	<3	0	<3	x	s
Machinery	0	0	0	0	0	0	0	0
Transport	6	8	4	4	4	26	16.46	1.78
Natural/environmental	<3	0	0	0	0	<3	x	s
Poisoning	0	0	0	0	<3	<3	x	s
Struck by, against	0	0	0	0	0	0	0	0
Suffocation	<3	<3	<3	0	<3	3	1.9	0.2
Other specified, classifiable	<3	0	0	0	<3	<3	x	s
Other specified, not elsewhere classified	0	0	0	0	0	0	0	0
Unspecified	0	<3	<3	0	0	<3	x	s
Complications of medical and surgical care	0	0	0	0	0	0	0	0
Sequelae of surgical and medical care as external cause	<3	0	0	0	0	<3	x	s
Total unintentional injury	13	10	10	7	7	47	29.75	3.21
Intentional injury								
Assault	0	0	<3	0	0	<3	x	s
Suicide	<3	5	9	9	11	36	22.78	2.46
Total intentional injury	<3	5	10	9	11	37	23.42	2.53
Missing data	<3	<3	<3	0	0	<3	x	s
Total	29	29	36	33	31	158	100	10.79

'x' indicates percent not calculated due to small numbers.

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 10–14 years.

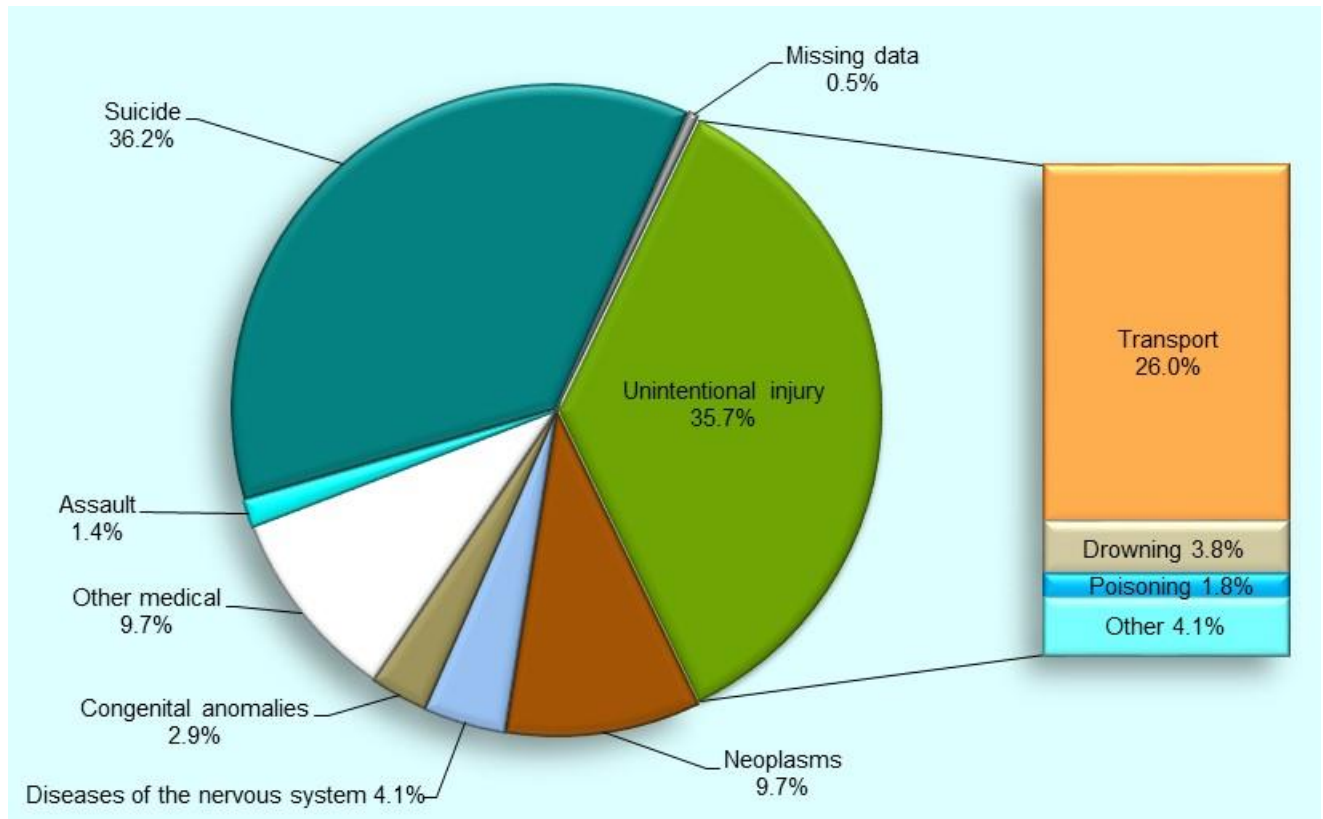
Figure 10.3: Mortality (rates per 100,000 population with 95 percent confidence intervals) in children aged 10–14 years by NZ Deprivation Index quintile, Aotearoa/New Zealand 2013–17 combined (n=158 deaths)



Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 10–14 years.

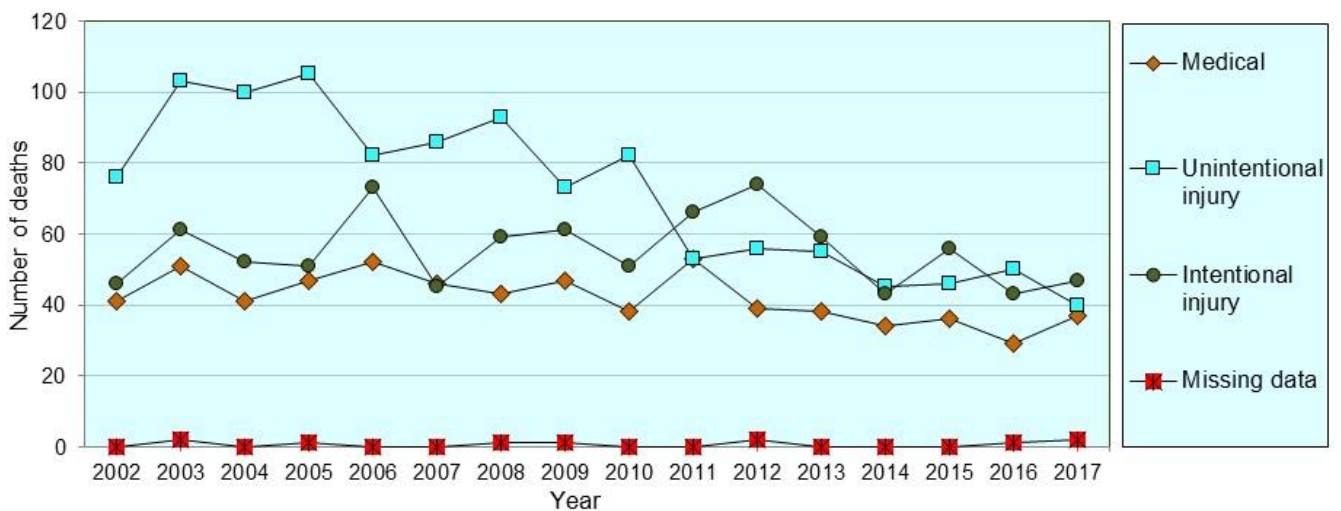
11. Young people aged 15–19 years

Figure 11.1: Mortality (%) in young people aged 15–19 years by cause of death, Aotearoa/New Zealand 2013–17 combined (n=661 deaths)



Source: Mortality Review Database.

Figure 11.2: Mortality (number of deaths) in young people aged 15–19 years by cause and year of death, Aotearoa/New Zealand 2002–17 (n=2,714 deaths)



Source: Mortality Review Database.

Table 11.1: Mortality (number of deaths and rates per 100,000 population) in young people aged 15–19 years by cause and year of death, Aotearoa/New Zealand 2013–17 (n=661 deaths)

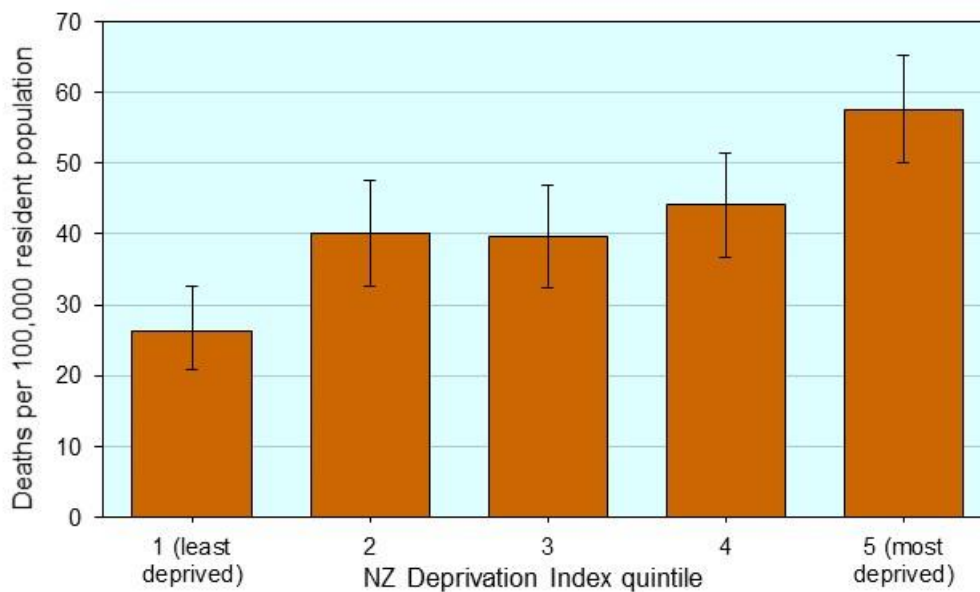
Cause of death	2013	2014	2015	2016	2017	Total	%	Rate 2013–17
Medical								
Infectious and parasitic disease	<3	3	<3	<3	<3	6	0.91	0.38
Neoplasms	14	11	14	14	11	64	9.68	4.1
Diseases of the blood and blood-forming organs and disorders of the immune system	<3	<3	<3	<3	0	5	0.76	0.32
Endocrine, nutritional and metabolic diseases	3	<3	3	<3	<3	10	1.51	0.64
Mental and behavioural disorders	<3	0	<3	<3	<3	3	0.45	0.19
Diseases of the nervous system	4	5	6	5	7	27	4.08	1.73
Diseases of the circulatory system	6	5	<3	<3	4	18	2.72	1.15
Diseases of the respiratory system	4	<3	0	<3	<3	8	1.21	0.51
Diseases of the digestive system	<3	0	0	0	<3	<3	x	s
Diseases of the skin and subcutaneous tissue	0	0	0	0	0	0	0	0
Diseases of the musculoskeletal system and connective tissue	<3	0	0	<3	<3	<3	x	s
Diseases of the genitourinary system	0	0	0	0	0	0	0	0
Pregnancy, childbirth and the puerperium	0	0	0	0	0	0	0	0
Certain conditions originating in the perinatal period	0	0	0	0	0	0	0	0
Congenital anomalies	<3	6	7	<3	5	19	2.87	1.22
Symptoms and abnormal findings not elsewhere classified	<3	<3	<3	<3	5	10	1.51	0.64
Total medical	38	34	36	29	37	174	26.32	11.15
Unintentional injury (includes undetermined intent and legal intervention/war)								
Cut/pierce	0	0	0	0	<3	<3	x	s
Drowning	5	6	6	5	3	25	3.78	1.6
Fall	3	<3	<3	0	<3	7	1.06	0.45
Fire/hot object or substance	0	3	<3	<3	<3	5	0.76	0.32
Firearm	<3	0	<3	0	0	<3	x	s
Machinery	<3	<3	0	0	<3	<3	x	s
Transport	37	30	36	41	28	172	26.02	11.02
Natural/environmental	0	0	0	0	0	0	0	0
Poisoning	5	<3	<3	<3	<3	12	1.82	0.77
Struck by, against	<3	<3	0	<3	<3	3	0.45	0.19
Suffocation	<3	<3	<3	<3	<3	4	0.61	0.26
Other specified, classifiable	<3	<3	0	0	<3	<3	x	s
Other specified, not elsewhere classified	0	0	0	0	<3	<3	x	s
Unspecified	<3	0	<3	0	0	<3	x	s
Complications of medical and surgical care	0	0	0	0	0	0	0	0
Sequelae of surgical and medical care as external cause	0	0	0	0	0	0	0	0
Total unintentional injury	55	45	46	50	40	236	35.7	15.12
Intentional injury								
Assault	<3	3	<3	<3	<3	9	1.36	0.58
Suicide	57	40	55	41	46	239	36.16	15.31
Total intentional injury	59	43	56	43	47	248	37.52	15.89
Missing data	<3	<3	<3	<3	<3	3	0.45	0.19
Total	152	122	138	123	126	661	100	42.35

'x' indicates percent not calculated due to small numbers.

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 15–19 years.

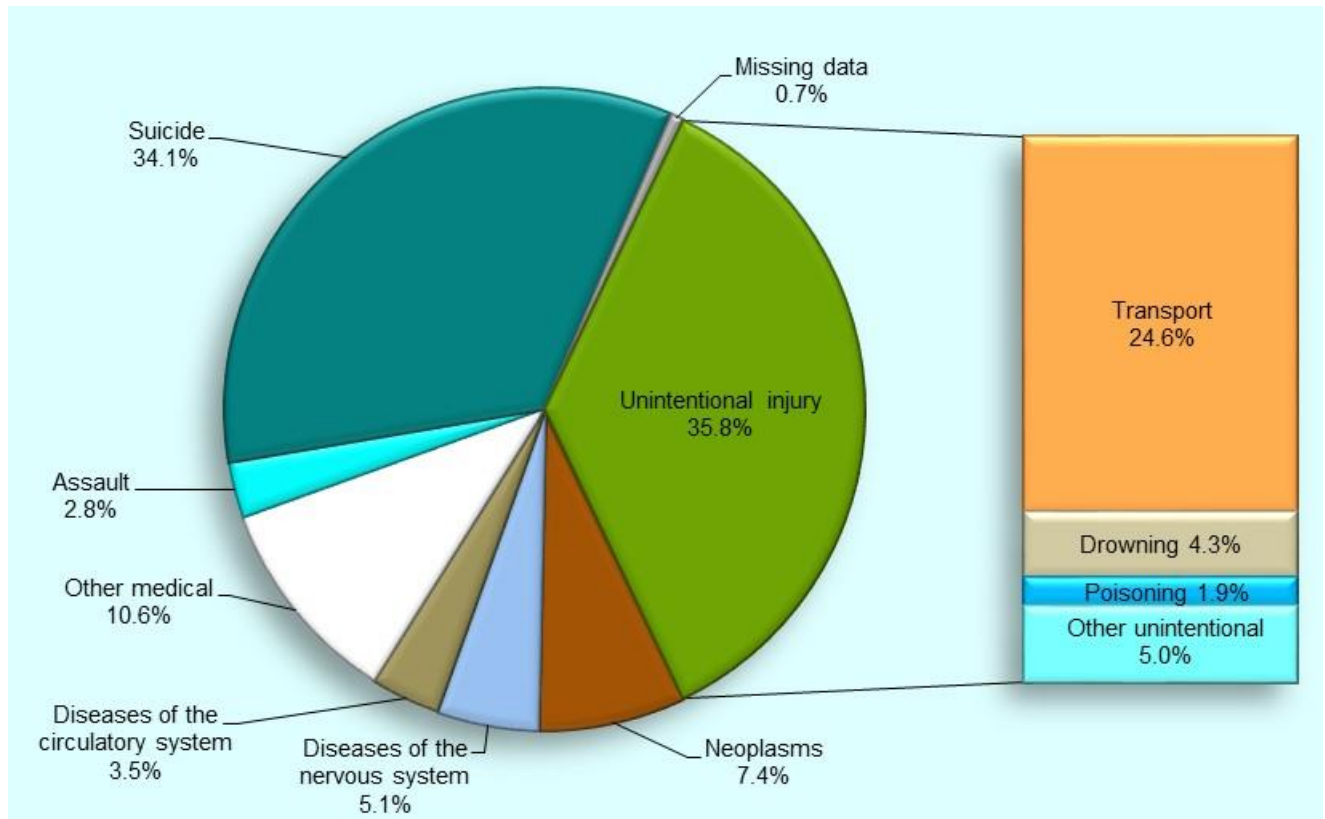
Figure 11.3: Mortality (rates per 100,000 population with 95 percent confidence intervals) in young people aged 15–19 years by NZ Deprivation Index quintile, Aotearoa/New Zealand 2013–17 combined (n=661 deaths)



Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 15–19 years.

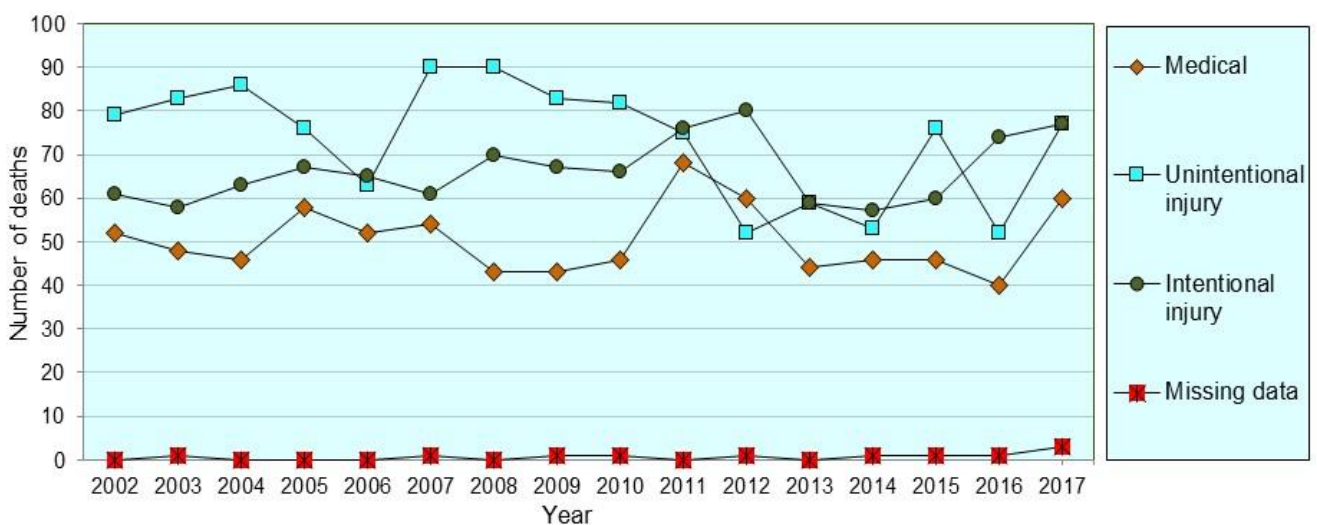
12. Young people aged 20–24 years

Figure 12.1: Mortality (%) in young people aged 20–24 years by cause of death, Aotearoa/New Zealand 2013–17 combined (n=886 deaths)



Source: Mortality Review Database.

Figure 12.2: Mortality (number of deaths) in young people aged 20–24 years by cause and year of death, Aotearoa/New Zealand 2002–17 (n=3,054 deaths)



Source: Mortality Review Database.

Table 12.1: Mortality (number of deaths and rates per 100,000 population) in young people aged 20–24 years by cause and year of death, Aotearoa/New Zealand 2013–17 (n=886 deaths)

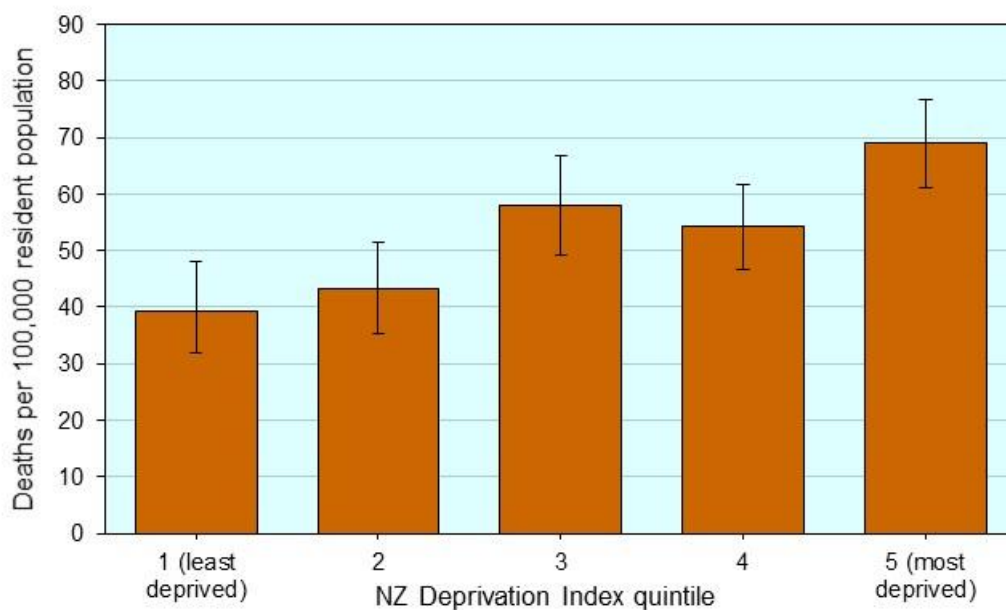
Cause of death	2013	2014	2015	2016	2017	Total	%	Rate 2013–17
Medical								
Infectious and parasitic disease	0	0	<3	<3	<3	<3	x	s
Neoplasms	12	18	10	13	13	66	7.45	4.1
Diseases of the blood and blood-forming organs and disorders of the immune system	<3	<3	0	0	<3	<3	x	s
Endocrine, nutritional and metabolic diseases	<3	<3	4	<3	3	12	1.35	0.75
Mental and behavioural disorders	<3	<3	3	<3	<3	8	0.9	0.5
Diseases of the nervous system	10	9	11	8	7	45	5.08	2.8
Diseases of the circulatory system	6	5	5	5	10	31	3.5	1.93
Diseases of the respiratory system	<3	<3	<3	4	4	10	1.13	0.62
Diseases of the digestive system	<3	<3	0	0	<3	4	0.45	0.25
Diseases of the skin and subcutaneous tissue	0	0	<3	0	0	<3	x	s
Diseases of the musculoskeletal system and connective tissue	0	0	<3	<3	<3	<3	x	s
Diseases of the genitourinary system	<3	<3	<3	<3	3	6	0.68	0.37
Pregnancy, childbirth and the puerperium	<3	0	<3	<3	<3	5	0.56	0.31
Certain conditions originating in the perinatal period	0	0	0	0	0	0	0	0
Congenital anomalies	5	4	7	<3	4	21	2.37	1.31
Symptoms and abnormal findings not elsewhere classified	<3	3	<3	4	13	21	2.37	1.31
Total medical	44	46	46	40	60	236	26.64	14.67
Unintentional injury (includes undetermined intent and legal intervention/war)								
Cut/pierce	0	0	<3	0	0	<3	x	s
Drowning	6	5	13	6	8	38	4.29	2.36
Fall	3	5	<3	<3	3	12	1.35	0.75
Fire/hot object or substance	<3	<3	0	<3	<3	3	0.34	0.19
Firearm	<3	<3	3	<3	0	5	0.56	0.31
Machinery	0	0	<3	0	<3	3	0.34	0.19
Transport	36	36	51	40	55	218	24.6	13.55
Natural/environmental	<3	<3	0	0	<3	<3	x	s
Poisoning	4	3	3	3	4	17	1.92	1.06
Struck by, against	3	<3	<3	<3	0	5	0.56	0.31
Suffocation	4	0	<3	<3	<3	8	0.9	0.5
Other specified, classifiable	<3	<3	<3	<3	<3	4	0.45	0.25
Other specified, not elsewhere classified	0	0	0	0	<3	<3	x	s
Unspecified	<3	<3	0	<3	0	<3	x	s
Complications of medical and surgical care	0	0	0	0	0	0	0	0
Sequelae of surgical and medical care as external cause	0	0	0	0	0	0	0	0
Total unintentional injury	59	53	76	52	77	317	35.78	19.71
Intentional injury								
Assault	5	5	6	6	3	25	2.82	1.55
Suicide	54	52	54	68	74	302	34.09	18.78
Total intentional injury	59	57	60	74	77	327	36.91	20.33
Missing data	<3	<3	<3	<3	3	6	0.68	0.37
Total	162	157	183	167	217	886	100	55.08

'x' indicates percent not calculated due to small numbers.

's' indicates rate not calculated due to small numbers.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 20–24 years.

Figure 12.3: Mortality (rates per 100,000 population and 95 percent confidence intervals) in young people aged 20–24 years by NZ Deprivation Index quintile, Aotearoa/New Zealand 2013–17 combined (n=883 deaths*)

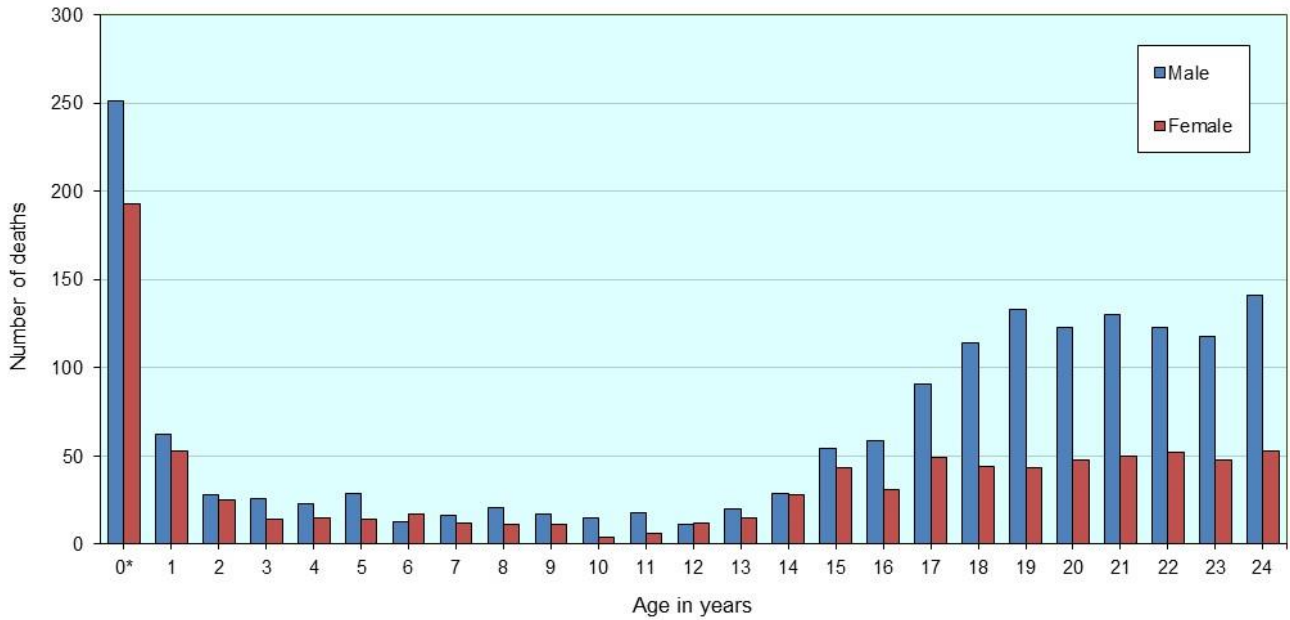


* Excludes three cases with no available deprivation data.

Sources: Numerator: Mortality Review Database; Denominator: NZMRDG Estimated Resident Population 2013–17, 20–24 years.

13. Mortality by sex

Figure 13.1: Mortality (number of deaths) in children and young people aged 28 days to 24 years by age and sex, Aotearoa/New Zealand 2013–17 combined (n=2,556 deaths)



* This category represents infants 28 days and older, and less than one calendar year in age.
 Source: Mortality Review Database.

Table 13.1: Mortality (number of deaths) in children and young people aged 28 days to 24 years, by cause of death and sex, Aotearoa/New Zealand 2013–17 combined (n=2,556 deaths)

	Male	Female	Total
Medical			
Infectious and parasitic disease	24	24	48
Neoplasms	139	99	238
Diseases of the blood and blood-forming organs and disorders of the immune system	8	8	16
Endocrine, nutritional and metabolic diseases	27	20	47
Mental and behavioural disorders	5	8	13
Diseases of the nervous system	81	54	135
Diseases of the eye and adnexa	0	0	0
Diseases of the ear and mastoid process	0	<3	<3
Diseases of the circulatory system	59	34	93
Diseases of the respiratory system	40	39	79
Diseases of the digestive system	8	8	16
Diseases of the skin and subcutaneous tissue	<3	0	<3
Diseases of the musculoskeletal system and connective tissue	<3	4	6
Diseases of the genitourinary system	6	<3	7
Pregnancy, childbirth and the puerperium	0	5	5
Certain conditions originating in the perinatal period	37	26	63
Congenital anomalies	92	68	160
Symptoms and abnormal findings not elsewhere classified	28	12	40
Total medical	557	411	968
Percentage by sex	57.54	42.46	100
Unintentional injury (undetermined intent, legal intervention war)			
Cut/pierce	<3	0	<3
Drowning	76	22	98
Fall	23	3	26
Fire/hot object or substance	8	7	15
Firearm	9	0	9
Machinery	5	<3	6
Transport	351	130	481
Natural/environmental	5	2	7
Poisoning	23	11	34
Struck by, against	10	<3	12
Suffocation	18	7	25
Other specified, classifiable	8	<3	10
Other specified, not elsewhere classified	<3	<3	<3
Unspecified	3	<3	5
Complications of medical and surgical care	0	0	0
Sequelae of surgical and medical care as external cause	<3	0	<3
Total unintentional injury	543	190	733
Percentage by sex	74.08	25.92	100
Intentional injury			
Assault	37	19	56
Suicide	393	184	577
Total intentional injury	430	203	633
Percentage by sex	67.93	32.07	100
SUDI/SUD			
SUDI (28 days to <1 year)	117	78	195
SUD (1–2 years)	8	3	11
Total SUDI/SUD	125	81	206
Percentage by sex	60.68	39.32	100
Missing data	10	6	16
Total	1665	891	2,556
Percentage by sex	65.1	34.9	100

Source: Mortality Review Database.

14. Overseas residents

Table 14.1: Mortality (number of deaths) in children and young people aged 28 days to 24 years among non-New Zealand residents, by cause of death and age group, Aotearoa/New Zealand 2013–17 combined (n=59 deaths)

Category	28 days–1 year	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total	%
Medical	3	<3	–	–	4	<3	10	16.9
Unintentional injury	–	<3	–	3	12	28	45	76.3
Intentional injury	–	–	–	–	<3	–	<3	x
SUDI/SUD	<3	–	–	–	–	–	<3	x
Missing data	<3	–	–	–	<3	<3	<3	x
Total	4	4	–	3	18	30	59	100

'x' indicates percent not calculated due to small numbers.

Source: Mortality Review Database.

Table 14.2: Mortality (number of deaths) in children and young people aged 28 days to 24 years among non-New Zealand residents by country of residence and year of death, Aotearoa/New Zealand 2013–17 (n=59 deaths)

Country	Deaths per year					Total deaths	
	2013	2014	2015	2016	2017	Number	%
Australia	<3	4	4	4	<3	15	25.4
Canada	<3	0	<3	0	0	3	5.1
China	0	<3	<3	<3	0	4	6.8
Cook Islands	0	0	0	0	<3	<3	x
Fiji	0	<3	0	0	0	<3	x
France	0	0	<3	0	0	<3	x
French Polynesia	<3	<3	0	<3	<3	3	5.1
Germany	<3	3	<3	4	5	13	22
India	0	<3	0	0	<3	<3	x
Kazakhstan	<3	0	0	0	0	<3	x
Malaysia	0	<3	0	0	0	<3	x
Samoa	<3	0	<3	0	<3	<3	x
Tonga	0	<3	<3	<3	0	<3	x
United Kingdom	0	0	<3	0	0	<3	x
USA	0	0	5	<3	<3	7	11.9
Vanuatu	0	<3	0	0	0	<3	x
Total	6	14	17	13	9	59	100

'x' indicates percent not calculated due to small numbers.

Source: Mortality Review Database.

15. Mortality by DHB of residence

Table 15.1: Mortality (number of deaths and rates per 100,000 population) in children and young people aged 28 days to 24 years by DHB of residence and age group, Aotearoa/New Zealand 2013–17 (n=2,556 deaths)

DHB	28 days–<1 year	Rate:* 28 days–<1 year	1–4 years	Rate:‡ 1–4 years	5–9 years	Rate:‡ 5–9 years	10–14 years	Rate:‡ 10–14 years	15–19 years	Rate:‡ 15–19 years	20–24 years	Rate:‡ 20–24 years	Total	%	Rate:‡ per DHB	Number of deaths outside DHB of residence	Number of deaths in DHB of residence	% resident deaths outside DHB
Northland	22	1.95	13	25.07	9	14.65	7	11.81	36	65.47	52	118.62	139	5.4	49.18	26	113	18.7
Waitematā	29	0.73	34	20.45	25	13.34	15	8.31	55	27.93	84	42.65	242	9.5	25.01	85	157	35.1
Auckland	28	0.93	14	11.26	13	9.41	<3	s	35	22.02	65	29.88	156	6.1	19.55	30	126	19.2
Counties Manukau	92	2.21	37	21.77	14	7.07	27	14.04	82	41.23	92	47.9	344	13.5	34.65	90	254	26.2
Waikato	62	2.29	26	21.94	14	10.17	14	10.62	69	50.09	87	63.03	272	10.7	39.38	30	242	11
Lakes	12	1.59	6	18.86	<3	s	8	21.23	26	73.7	32	100.94	86	3.4	47.11	15	71	17.4
Bay of Plenty	26	1.82	15	24.05	10	13.07	17	22.28	47	67.79	50	84.83	165	6.5	46.12	34	131	20.6
Hauora Tairāwhiti	10	2.71	4	25.27	5	25.22	<3	s	11	64.76	13	86.17	45	1.8	49.86	12	33	26.7
Hawke's Bay	19	1.79	14	28.78	12	21.17	7	12.25	34	62.87	42	94.6	128	5	47.14	13	115	10.2
Taranaki	9	1.2	10	27.94	5	12.53	4	10.4	14	39.41	18	54.06	60	2.4	31.49	9	51	15
Whanganui	10	2.38	3	16.49	3	14.7	<3	s	12	59.24	16	89.85	46	1.8	45.45	13	33	28.3
MidCentral	12	1.14	6	12.54	9	15.83	10	18.02	33	53.39	46	71.62	116	4.5	39.08	25	91	21.6
Capital & Coast	22	1.24	11	13.82	6	6.54	4	4.56	29	27.58	48	36.82	120	4.7	23.42	21	99	17.5
Hutt Valley	12	1.23	4	9.57	<3	s	5	10.53	22	46.52	27	58.93	72	2.8	29.91	22	50	30.6
Wairarapa	<3	s	3	26.06	0	0	0	0	11	81.23	8	73.11	24	0.9	35.96	9	15	37.5
Nelson Marlborough	7	0.92	<3	s	0	0	<3	s	9	21.35	26	79.89	45	1.8	21.36	10	35	22.2
West Coast	<3	s	4	41.87	<3	s	3	31.86	11	115.78	10	110.07	31	1.2	62.43	6	25	19.4
Canterbury	40	1.29	20	15.15	17	10.74	10	6.49	73	42.99	90	47.92	250	9.8	30	20	230	8
South Canterbury	<3	s	4	27.14	3	17.51	3	16.83	7	38.55	7	46.44	26	1	30.2	4	22	15.4
Southern	26	1.53	17	20.89	11	11.74	17	18.58	45	39.36	72	59.01	188	7.4	36.16	27	161	14.4
Unknown DHB	<3	s	<3	s	0	0	0	0	0	0	<3	s	<3	x	s	–	–	–
Total	444	1.49	246	18.94	161	10.65	158	10.79	661	42.35	886	55.12	2,556	100	33.02	502	2,054	19.6

's' indicates rate not calculated due to small numbers.

* rate per 1,000 live births.

‡ rate per 100,000 resident population.

Sources: Numerator: Mortality Review Database; Denominator: Ministry of Health Live Birth Registrations 2013–16, NZMRDG 2017 for 28 days to less than one year, NZMRDG age-specific Estimated Resident Population 2013–17 for ages 1–24 years.

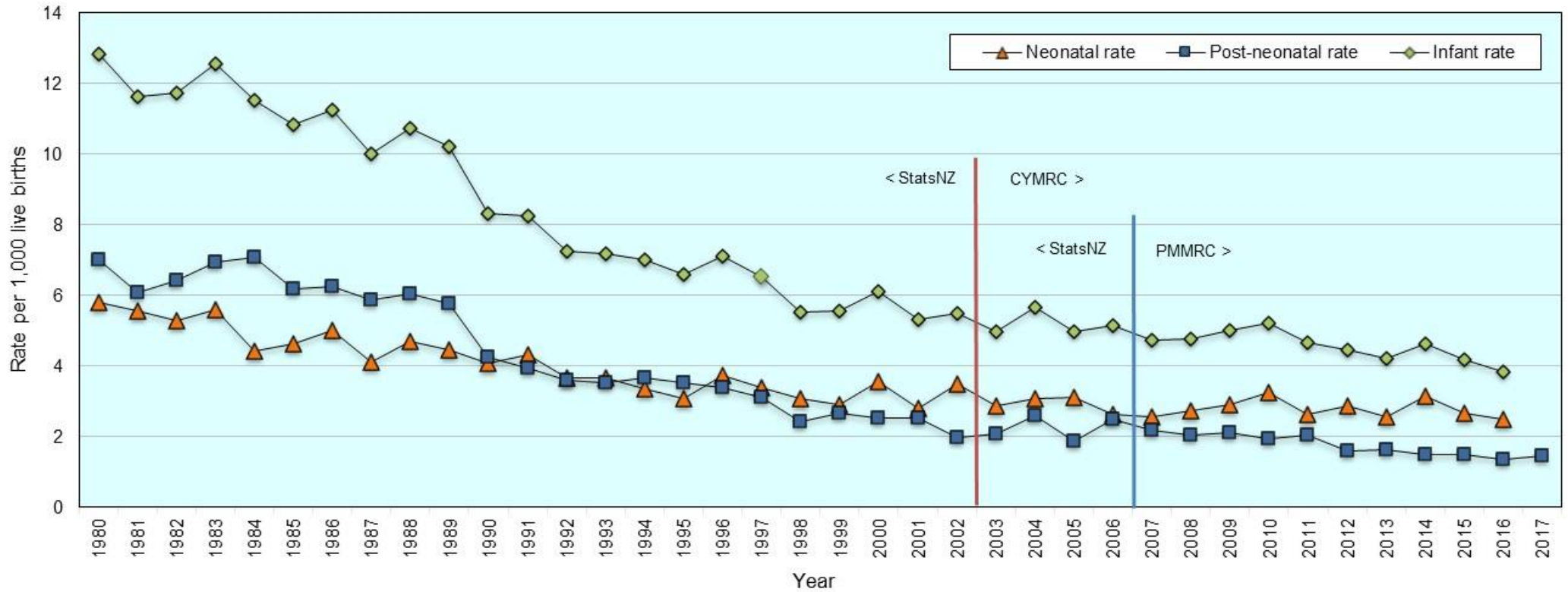
16. Historical data

Table 16.1: Mortality (number of deaths) in children and young people aged 28 days to 24 years by year of death and age group, Aotearoa/New Zealand 1980–2017

Year	28 days–<1 year	1–4 years	5–9 years	10–14 years	15–19 years	20–24 years	Total
1980	354	138	96	96	306	342	1,332
1981	309	159	78	96	318	327	1,287
1982	321	132	81	75	285	345	1,239
1983	351	111	78	93	279	381	1,293
1984	366	120	75	84	276	324	1,245
1985	321	111	87	96	306	324	1,245
1986	330	135	66	99	312	351	1,293
1987	324	111	72	93	324	372	1,296
1988	348	117	69	75	297	366	1,272
1989	336	111	66	69	336	360	1,278
1990	255	120	57	63	300	375	1,170
1991	237	96	63	66	240	324	1,026
1992	213	102	66	75	243	333	1,032
1993	207	111	42	57	249	336	1,002
1994	210	99	54	48	198	279	888
1995	204	90	54	60	222	330	960
1996	195	96	54	66	258	267	936
1997	180	99	51	60	237	240	867
1998	135	84	51	72	210	222	774
1999	153	75	39	66	198	219	750
2000	144	84	48	60	168	189	693
2001	141	75	48	63	189	210	726
2002	107	81	48	47	163	192	638
2003	117	66	38	61	217	190	689
2004	152	57	37	53	193	195	687
2005	109	59	41	50	204	201	664
2006	150	61	32	43	207	180	673
2007	141	81	38	53	177	206	696
2008	134	81	35	49	196	203	698
2009	134	77	33	54	182	194	674
2010	126	65	19	45	171	195	621
2011	126	59	15	41	172	219	632
2012	98	63	30	46	171	193	601
2013	97	51	25	29	152	162	516
2014	87	52	39	29	122	157	486
2015	93	54	31	36	138	183	535
2016	81	44	35	33	123	167	483
2017	86	45	31	31	126	217	536

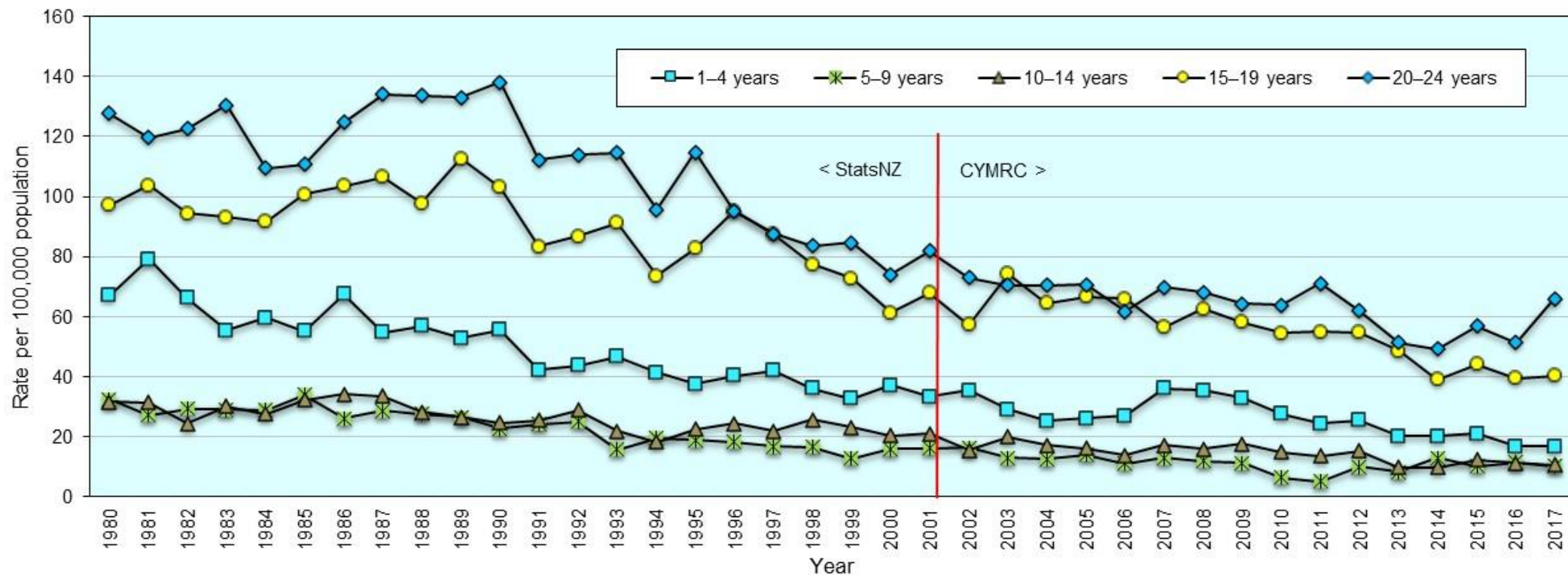
Sources: 1980–2001: Statistics New Zealand. 2002–17: Mortality Review Database.

Figure 16.1: Neonatal, post-neonatal and infant mortality (rates per 1,000 live births) in infants 0 days to less than one year of age by year of death, Aotearoa/New Zealand 1980–2017



Sources: Numerator: Neonatal deaths (0–27 days): 1980–2006: Statistics New Zealand. 2007–17: Mortality Review Database (PMMRC data). Note: 2017 data for neonatal deaths not yet available. Post-neonatal deaths (28 days to less than one year): 1980–2001: Statistics New Zealand; 2002–17: Mortality Review Database (CYMRC data). Infant deaths (0 days to less than one year): sum of neonatal and post-neonatal deaths, as described above. Denominator: (all) Statistics New Zealand live births 1980–2017.

Figure 16.2: Mortality (rates per 100,000 population) in children and young people aged 1–24 years by age group and year of death, Aotearoa/New Zealand 1980–2017

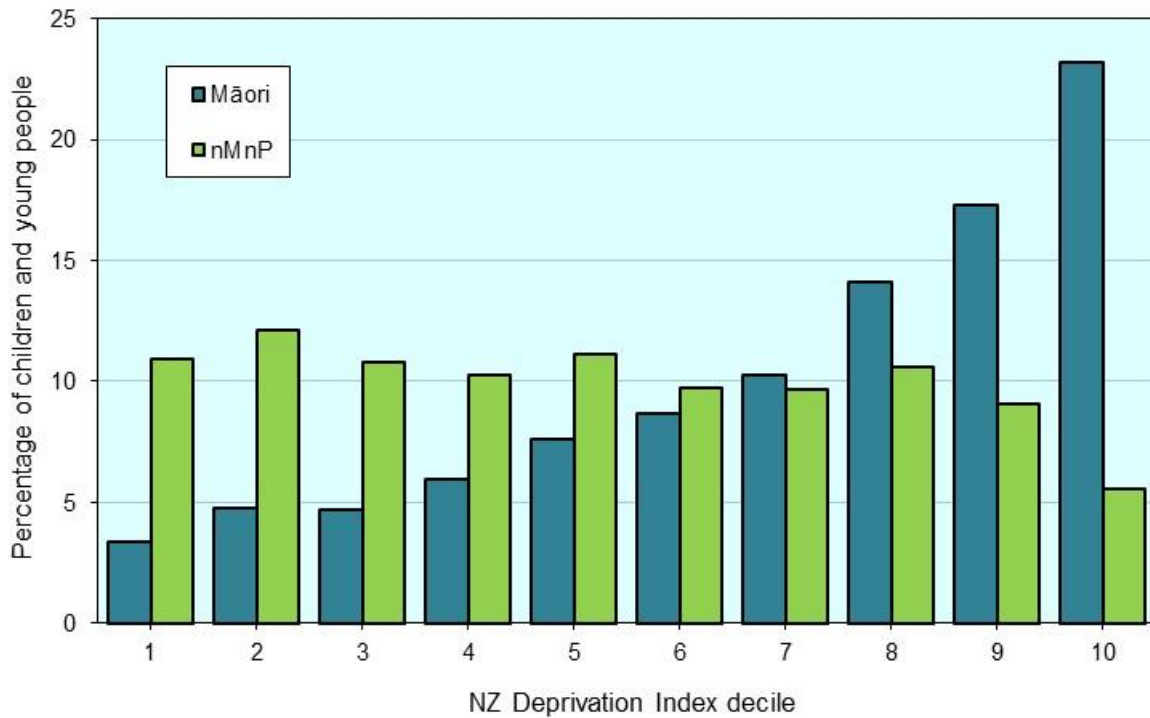


Sources: Numerator: 1980–2001: Statistics New Zealand; 2002–17: Mortality Review Database; Denominator: Statistics New Zealand age-specific estimated population 1980–2017.

17. New Zealand Deprivation Index

Higher proportions of tamariki and rangatahi Māori live in the most deprived (NZ Deprivation Index) areas of Aotearoa/New Zealand. During 2002–17, 40 percent of Māori, compared with 15 percent of non-Māori non-Pacific aged 0–24 years, were living in NZ Deprivation Index deciles 9 and 10. **Figure 17.1** shows the distribution of tamariki and rangatahi Māori was heavily skewed to the most deprived deciles, whereas non-Māori non-Pacific children and young people were relatively evenly distributed across the deciles.

Figure 17.1: Percentage of children and young people aged 0–24 years in Aotearoa/New Zealand by NZ Deprivation Index decile and prioritised ethnic category, 2002–17



nMnP = non-Māori non-Pacific.

Source: NZMRDG estimated resident population 2002–16, 0–24 years.