



THE RAINBOW REPORT

Understanding recent infant mortality changes in New Zealand
2001-2014

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Understanding recent infant mortality changes in New Zealand: 2001-2014



We have chosen a rainbow for the cover of this report because it symbolizes a past storm and the hope ahead. The data reported here represent young lives lost and the storm of grief that follows such tragedies. It also represents the hope made possible when people care, and by their best efforts bring about change. The storm is passing.

Prepared by:

Stephanie Cowan

Director

Change for our Children Limited

PO Box 36406

Christchurch 8146

Email: stephaniecowan@changeforourchildren.nz

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Introduction

As professionals and communities focus their attention on further reducing rates of sudden infant death, there is a need to know if it is making a positive difference. Such feedback, especially in the form of infant mortality statistics, helps to drive motivation, refine approaches, determine priorities, and direct, or redirect, resources.

Feedback needs to be *current* to be useful for these purposes. Too often, it is some years before we know sudden unexpected death in infancy (SUDI) rates, because a rigorous review process is needed before a cause of death can be assigned. To get around this lag time, we have prepared this report to offer our safe sleep champion networks an 'up-to-date' assessment of infant mortality in New Zealand, using statistics for total infant deaths.

Total infant deaths

Total infant deaths are not SUDI deaths. They include SUDI, but they also include infant deaths from all other causes, preventable and non-preventable. As such, we can logically assume that if total infant death rates are changing, then SUDI rates are too, SUDI being a largely preventable category of total infant deaths.

Year of occurrence

By New Zealand law, a death must be registered no later than three days following burial or cremation of a person, but this may not always happen, especially for very young infants. While deaths data in information releases from Statistics New Zealand are by 'date of registration', those used in this report relate to 'date of death'. Late registrations may account for small variations between the two, especially of infants in the first week of life, but 'year of death' is more accurate and useful for our purposes.

Age of infant

Approximately half of total infant deaths in New Zealand occur in the first week of life, due to birth defects, pre-term related and other less easily preventable causes. For this reason, deaths data used in this report exclude infants less than seven days old and only include infants aged one to fifty-two weeks. It is a way to reflect more accurately changing mortality from preventable causes.

Source of data

This document describes infant mortality statistics, by year of death, for the fourteen years since district health boards developed in 2001. It is based on customised data from Statistics New Zealand, which are licensed by Statistics New Zealand for re-use under the Creative Commons Attribution 3.0 New Zealand license. In order to comply with Statistics NZ's confidentiality protocols, some categories are collapsed or aggregated in tables.

Purpose

We have prepared this document to support our safe sleep champion networks, and their managers and interested others, with facts about recent infant mortality changes in New Zealand. We hope it will offer support with:

- Accuracy in planning and discussion
- Preparing presentations for education of peers
- Providing feedback to staff working in infant protection activities
- Reporting on services to managers and boards
- Providing context for infant health related activities.

Display of data

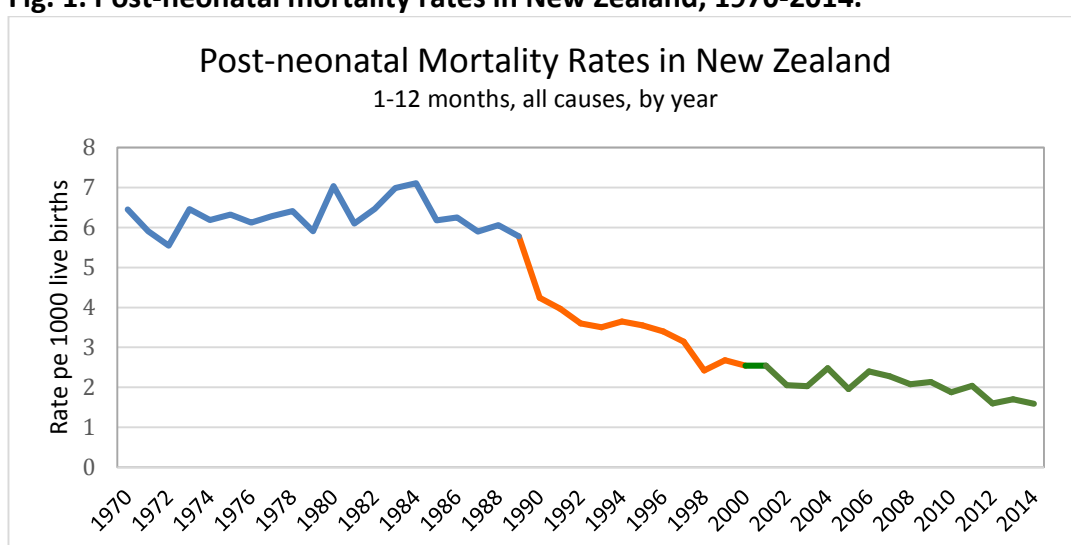
In most cases the data are grouped and displayed as line graphs to show clearly any changes over time. However, this does not mean that changes are linear or predictable. It does not mean that you can point to a part of the line midway between two points and assess its value. Fluctuations are likely within grouped data.

From where we have come

Before we examine infant mortality in recent times (this century), it may help to place this period in its historical context. Below is a graph of post-neonatal mortality changes (1-12 months, all causes) from 1970 to 2014, using data from [Infoshare](#) (Statistics New Zealand).

Total infant death rates fell from 5.8 to 2.5 per 1000 live births between 1989 and 2000 (marked in orange on the graph). Experts have attributed this as largely due to the uptake of 'back sleeping' by families. This rapid improvement in infant survival, serves as a chilling reminder of how dangerous it is for babies to be placed for sleep on the front or side, during a critical stage of their development (under six months).

Fig. 1. Post-neonatal mortality rates in New Zealand, 1970-2014.



Data Source: Statistics New Zealand, 2015

Prevention work in the years marked as green on the graph (this century) is more complex than in those marked as orange. Back sleeping has the greatest power as a protective factor against SUDI, but we entered the 'green' period with 'back sleeping' the norm. This single practice addressed a large proportion of the cause of sudden infant death and did so across the population. We must now accept a slower pace of overall change from addressing weaker, or less pervasive, risk factors. This means more focused effort on reducing smoking, improving breastfeeding, ensuring safe sleeping conditions, addressing alcohol-related infant deaths, and more.

There is a higher cost to people from avoiding smoking or avoiding bed sharing, than from placing infants on the back. As well, poverty and alcohol and/or drug use magnify the challenges. Information strategies, on their own, are no longer enough to support uptake of all recommended practices. Enabling approaches are also needed.

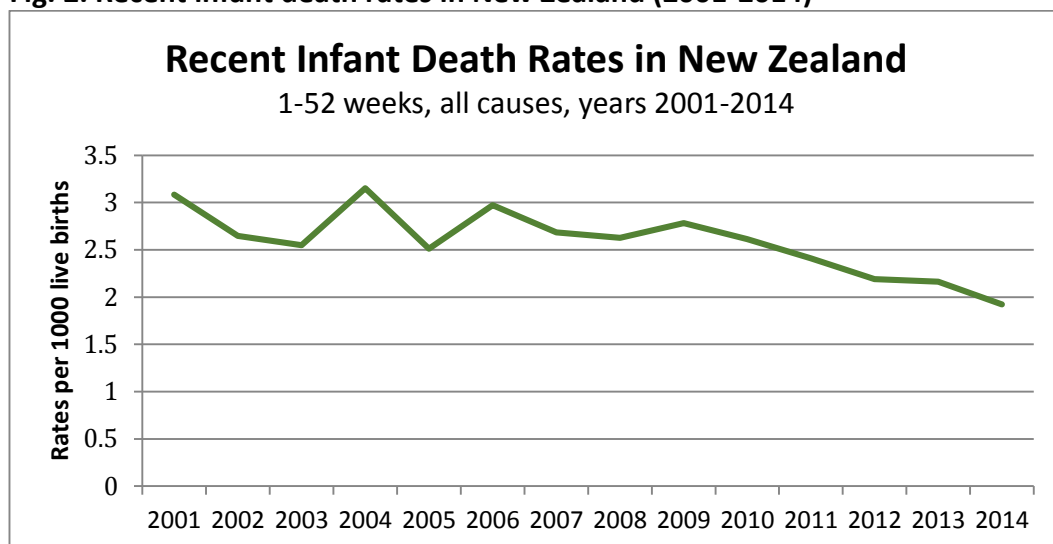
The green part of the graph above marks the period since 2000 and the introduction of district health boards. It is the period examined in detail in the remainder of this report.

Overview

1. Total infant death rates

Fact: Total infant death rates (all causes, infants 1-52 weeks) have been trending downwards for the past five years following a decade of little or no change. They reached an all-time low of 1.9 deaths per 1000 live births in 2014.

Fig. 2. Recent infant death rates in New Zealand (2001-2014)

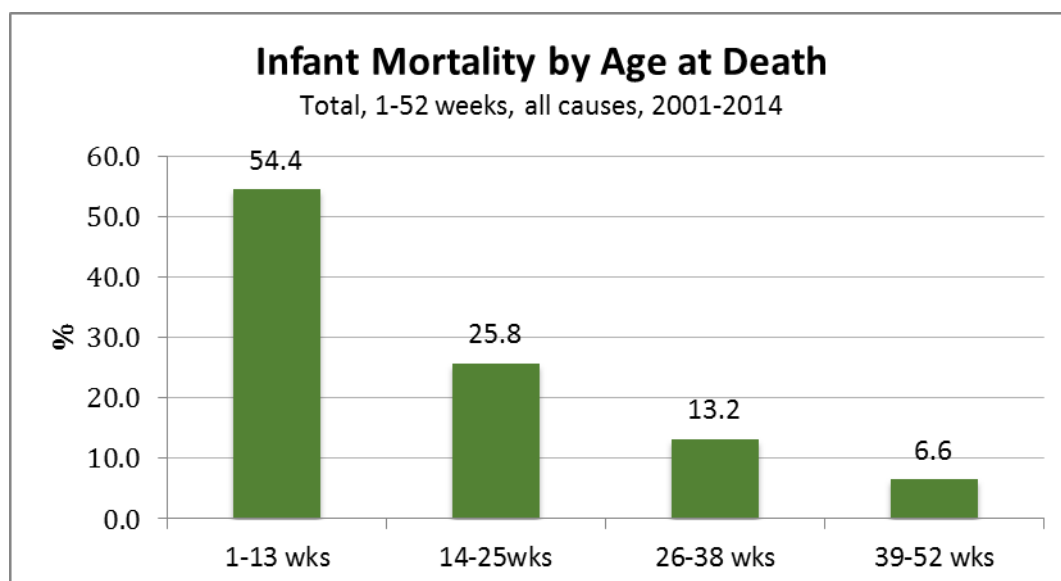


Data Source: Statistics New Zealand, 2015

2. Total infant deaths by age of infant

Fact: More than half of all deaths of infants aged one to fifty-two weeks happen in the first three months of life, and before six months for 80%.

Fig. 3. Distribution of total infant deaths by age at death (2001-2014)

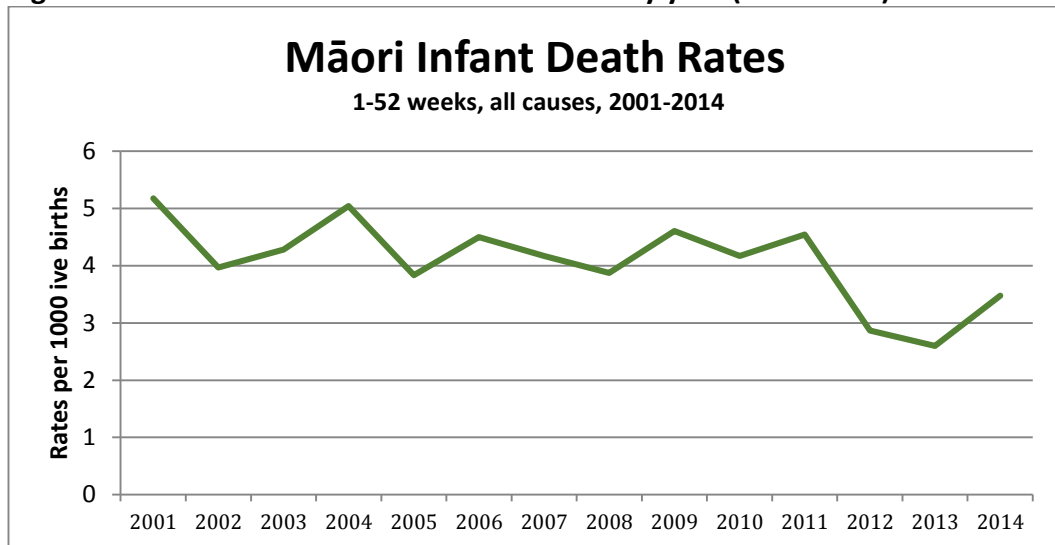


3. Total Māori infant death rates

Fact: Māori infant death rates fell sharply during 2012 and 2013 to record lows following ten years of little or no change, then rose during 2014.

Comment: The increase in the Māori infant death rate during 2014 may seem concerning. However, it was well below the rate for 2011 (3.5 vs 4.5 deaths per 1000 live births) and for the ten years before that. As numbers reduce, fluctuations are more likely.

Fig 4. Distribution of Māori infant death rates by year (2001-2014)



Grouped data

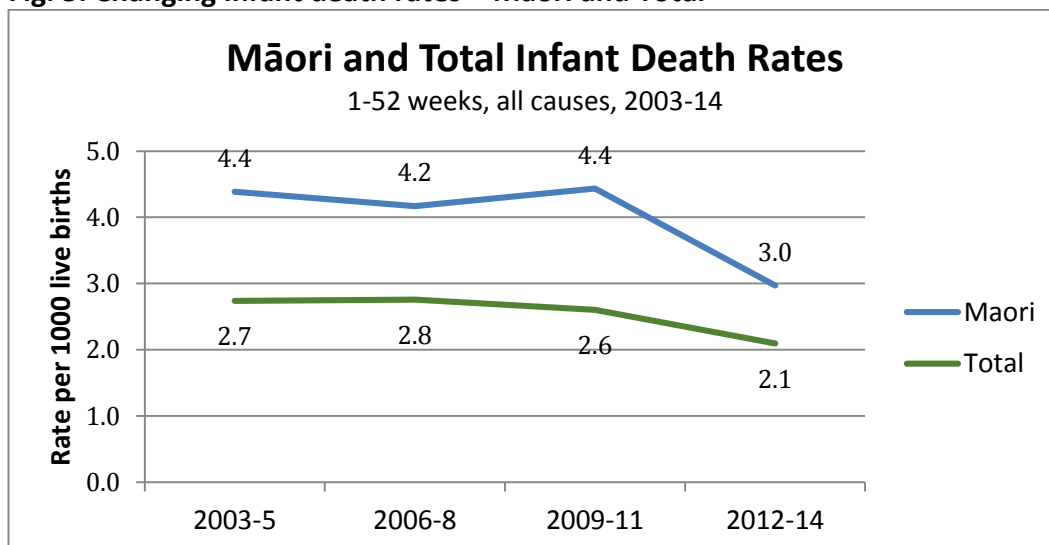
Infant death rates based on small numbers may fluctuate considerably from year to year, making sub-group analysis less meaningful. For this reason, we have looked at recent mortality changes grouped by health region, rather than individual DHB, and in four 3-year clusters, from 2003 to 2014, rather than year by year, to understand trends.

Recent changes in infant death rates

1. Recent changes by Māori and Total

Fact: Infant death rates, presented across 4 three-year time periods, show a recent overall fall between 2009-2011 and 2012-2014, from 2.6 to 2.1 deaths per 1000 live births, and from 4.4 to 3.0 for Māori. These recent changes follow a pattern of little or no change to infant death rates in preceding year clusters.

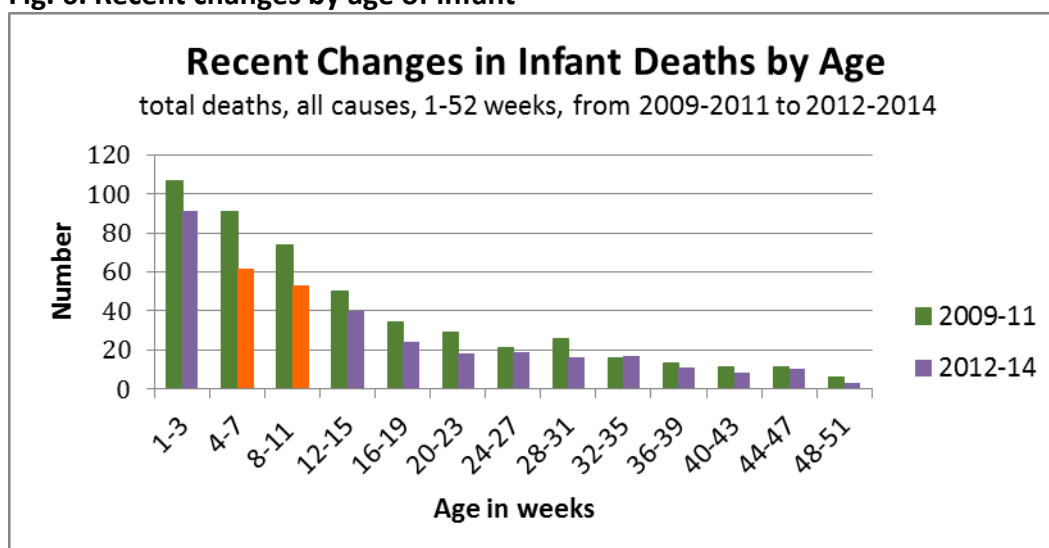
Fig. 5. Changing infant death rates – Māori and Total



2. Recent changes by age of infant

Fact: Infant deaths reduced in number across most ages, between the periods 2009-2011 and 2012-2014. This reduction was most marked for infants aged 4 to 12 weeks (marked in orange on the graph).

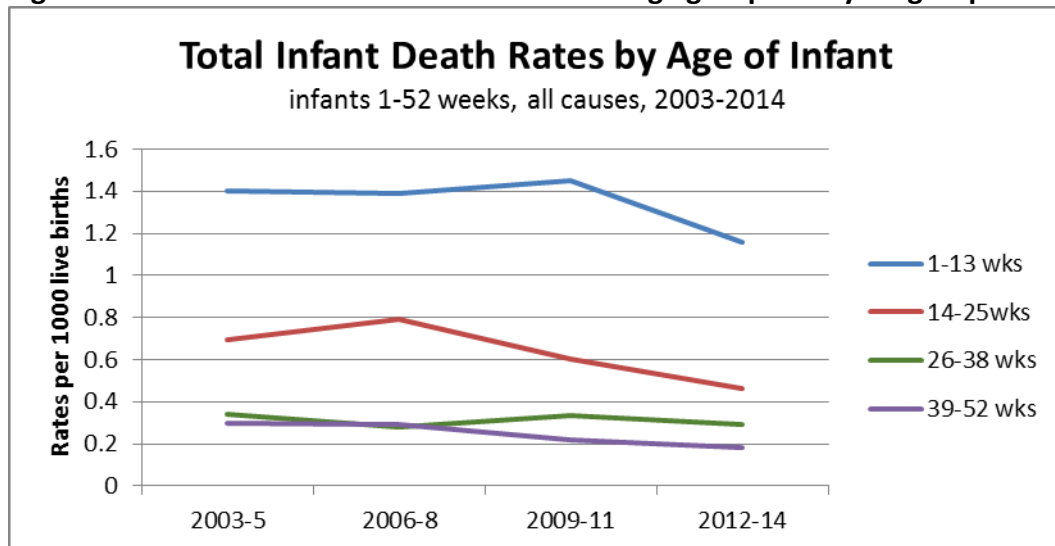
Fig. 6. Recent changes by age of infant



3. Recent total changes across age groups and year groups

Fact: There were 118 fewer infant deaths in 2012-2014 compared to 2009-2011. These recent falls were not distributed evenly across all age groups. From 2009, death rates have been falling for infants aged 14-25 weeks, but only since 2011 for younger infants (1-13 weeks). There has been little recent change for infants older than six months.

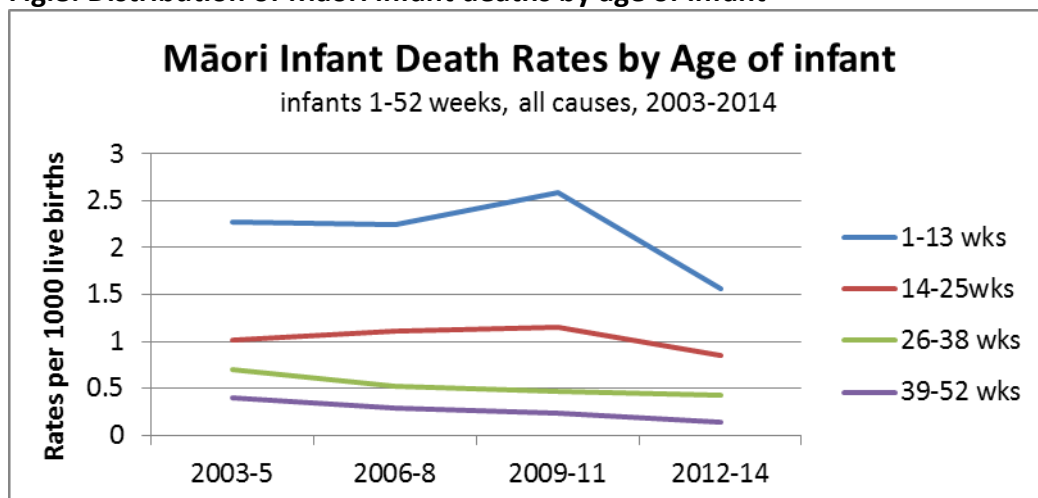
Fig.7. Distribution of total infant deaths across age groups and year groups



4. Recent Māori changes across age groups and year groups

Fact: Māori deaths of younger babies were on the *increase* prior to 2012 and fell sharply during the 2012-2014 period, especially for babies less than 14 weeks. Māori infants accounted for 78% of the overall reduction in numbers of deaths between the two periods (2009-2011 and 2012-2014), being 98 of a difference of 118.

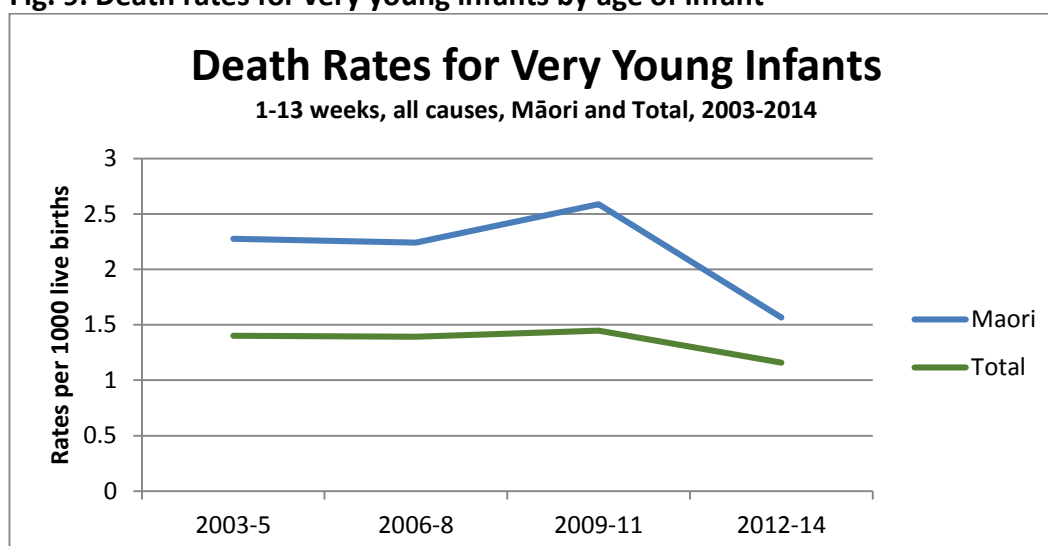
Fig.8. Distribution of Māori infant deaths by age of infant



5. Recent changes for very young infants (1-13 weeks)

Fact: Overall infant deaths of very young infants (1-13 weeks) fell by 67 between 2009-2011 and 2012-2014, and by 62 for Māori infants. Therefore Māori infants accounted for 93% of the recent reduction in deaths of very young infants. Total rates fell from 1.5 to 1.2 per 1000 live births between 2009-2011 and 2012-2014, and from 2.6 to 1.6 for Māori infants.

Fig. 9. Death rates for very young infants by age of infant



Birth numbers

1. Birth numbers by health regions

Fact: Total births in 2014 were distributed relatively evenly across Southern, Central and Midland health regions at 20%, and twice this for the Northern region. Māori births were not. Midland had the highest concentration of Māori births in 2014, twice that of Northern and Southern regions, and 1.5 times that of Central.

Table 1. Live births for 2014 by health regions, Māori and total.

		New Zealand Live Births for 2014			
Health Region	DHB	Māori		Total	
		N	%	N	%
NORTHERN		5295	33.5	23702	41.4
	Northland	1183	7.5	2048	3.6
	Waitemata	1281	8.1	7675	13.4
	Auckland	786	5	6036	10.5
	Counties Manukau	2045	12.9	7943	13.9
MIDLAND		4863	32.5	11235	19.6
	Waikato	1986	12.5	5106	8.9
	Lakes	727	4.6	1322	2.3
	Bay of Plenty	1214	7.7	2646	4.6
	Tairāwhiti	448	2.8	653	1.1
	Taranaki	488	4.9	1508	2.6
CENTRAL		3434	21.6	10688	18.7
	Hawke's Bay	957	6	2042	3.6
	Whanganui	378	2.4	787	1.4
	Midcentral	732	4.6	2050	3.6
	Hutt	512	3.2	1788	3.1
	Capital and Coast	675	4.3	3532	6.2
	Wairarapa	180	1.1	489	0.9
SOUTHERN		2227	14.1	11604	20.3
	Nelson Marlborough	334	2.1	1433	2.5
	West Coast	89	0.6	375	0.7
	Canterbury	1051	6.6	5935	10.4
	South Canterbury	95	0.6	621	1.1
	Otago	310	2	1851	3.2
	Southland	348	2.2	1389	2.4
	DHB not stated/ area outside DHB	9	0.1	13	0.0
Total New Zealand		15828	100	57242	100.0

2. Vulnerable infants by health region

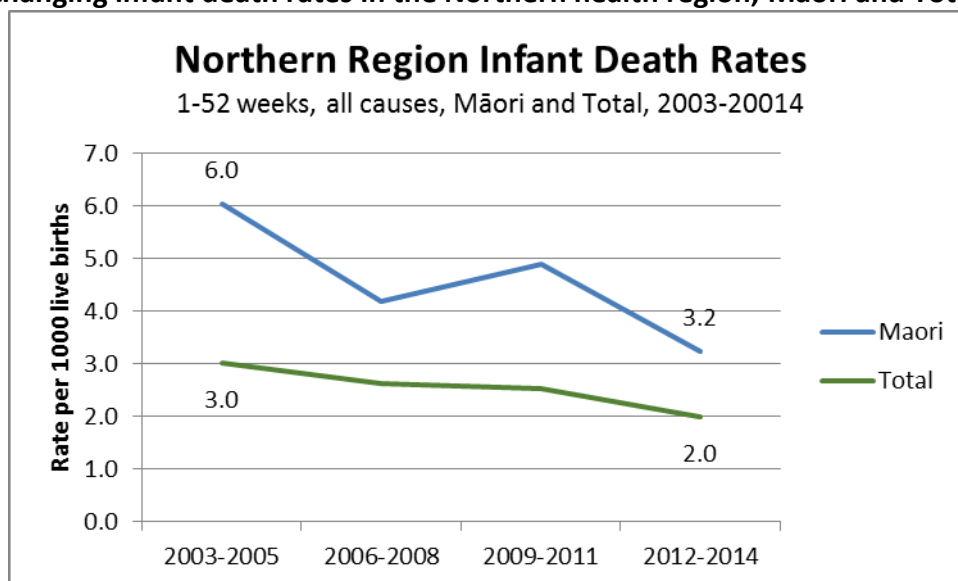
Fact: Māori infants have higher mortality rates (3 deaths per 1000 live births in 2014 compared to 2.1 overall). Therefore, Māori infants are a marker for 'more vulnerable'. With this logic, Midland has the greatest relative share of the country's vulnerable infants.

Infant deaths by health regions

1. Northern Region

Fact: Total infant death rates have been falling across the twelve-year period. Recent changes (during 2012-2014) have been most marked for Māori. There were 47 fewer total deaths and 37 fewer Māori compared to the previous period. This is 79% of the recent change. Inequalities have reduced considerably across the twelve years.

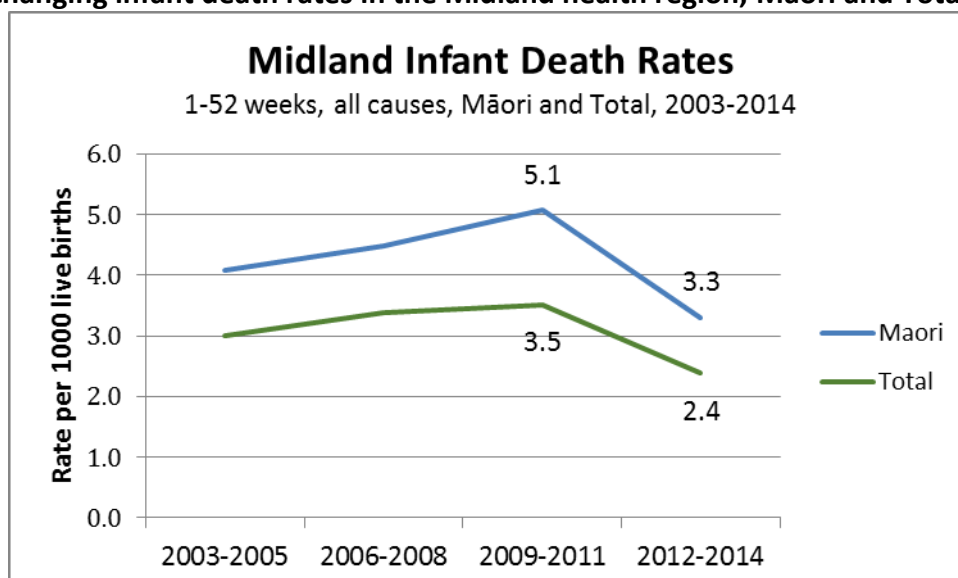
Fig. Changing infant death rates in the Northern health region, Māori and Total.



2. Midland region

Fact: Infant death rates were rising in Midland from 2003 to 2011 and fell sharply in the 2012-2014 period. There were 47 fewer deaths overall during 2012-2014 compared to the previous period, and 33 less for Māori (70% of the recent change).

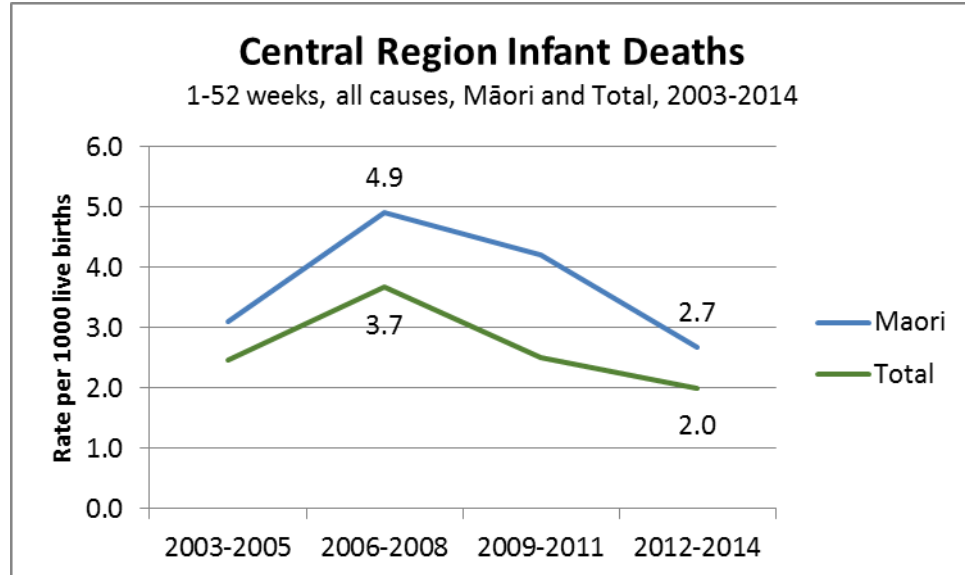
Fig. Changing infant death rates in the Midland health region, Māori and Total



3. Central region

Fact: Total infant death rates in the Central region began their fall during 2009-2011. This steepened for Māori during 2012-2014 when there were 24 fewer deaths overall compared to the previous period, and 20 less for Māori (83% of the change).

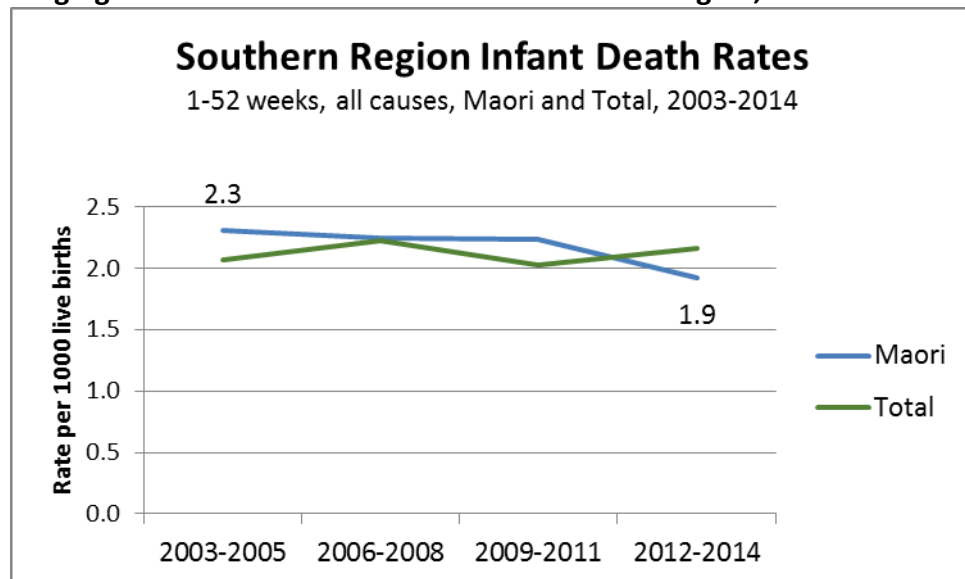
Fig. Changing infant death rates in the Central health region, Māori and Total.



4. Southern region

Fact: While total infant death rates have increased slightly over the twelve-year period, there has been a recent fall in Māori rates, from 2.2 per 1000 live births during 2009-2011 to 1.9 during 2012-2014. Inequalities reversed across the twelve-year period ending with lower infant death rates for Māori.

Fig. Changing infant death rates in the Southern health region, Māori and Total.



5. Comparing Total and Māori births and deaths by health region

Fact: There were 546,012 live births, identified by DHB, between 2003 and 2014 and 1,366 infant deaths (2.5 deaths per 1000 live births). Māori live births numbered 158,567 in the same period with 616 infant deaths (3.9 deaths per 1000 live births).

Below are tables with the statistics from which graphs of regional mortality rates have been derived.

Table 2a. Comparing Māori live births and infant deaths by health region

MĀORI	2003-2005	2006-2008	2009-2011	2012-2014
Infant Death Numbers				
Northern	100	80	92	55
Midland	61	74	83	50
Central	33	59	49	29
Southern	14	16	16	13
Live Māori Birth Numbers				
Northern	16566	19111	18835	17029
Midland	14976	16499	16380	15138
Central	10638	12021	11623	10870
Southern	6058	7145	7152	6764
Infant Death Rates				
Northern	6.0	4.2	4.9	3.2
Midland	4.1	4.5	5.1	3.3
Central	3.1	4.9	4.2	2.7
Southern	2.3	2.2	2.2	1.9

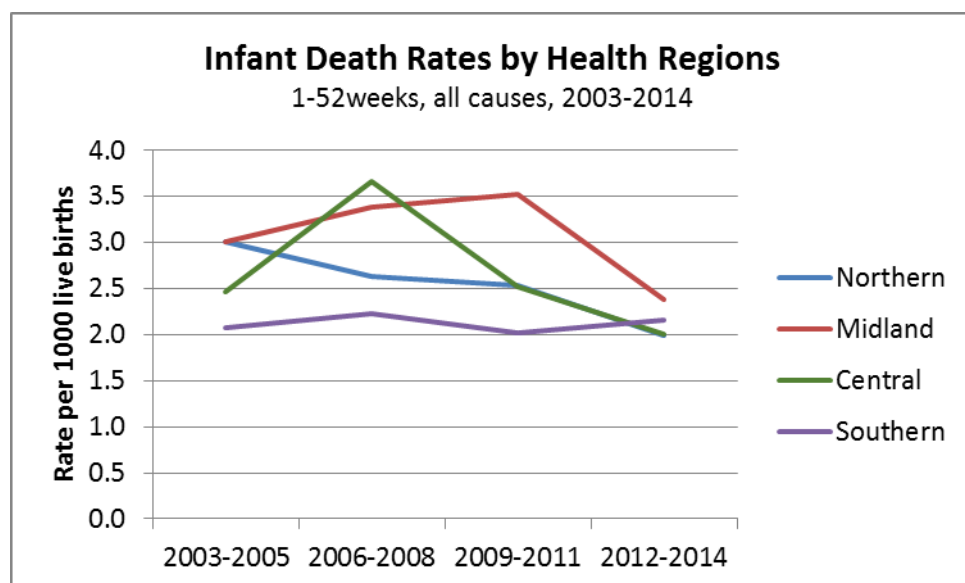
Table 2b. Comparing Total live births and infant deaths by health region.

TOTAL	2003-2005	2006-2008	2009-2011	2012-2014
Infant Death Numbers				
Northern	207	198	193	146
Midland	102	125	130	83
Central	80	112	91	67
Southern	73	86	78	77
Live Total Births Numbers				
Northern	68729	75069	75959	73222
Midland	33919	36974	36932	34854
Central	32407	30536	36195	33361
Southern	35274	38657	38583	35670
Infant Death Rates				
Northern	3.0	2.6	2.5	2.0
Midland	3.0	3.4	3.5	2.4
Central	2.5	3.7	2.5	2.0
Southern	2.1	2.2	2.0	2.2

6. Comparison of infant death rates across health regions

Fact: Recent changes to total infant death rates have not been equal across all health regions.

- The Northern region had the greatest overall change for the twelve-year period (from 3.0 to 2.0 deaths per 1000 live births). Rates have trended downward since the 2003-2005 period.
- Midland has had the greatest recent change (from 3.5 to 2.4 deaths per 1000 live births during 2012-2014). This reduction was against a previous upward trend during the 2003-2011 period from 3.0 to 3.5 deaths per 1000 live births.
- Central had the greatest range of infant death rates; the highest of all regions at 3.7 deaths per 1000 live births during 2006-2008 and lowest at 2.0 during 2012-2014. Reversing an upward trend happened earlier for Central (during 2009-2011) compared to Midland (during 2012-2014).
- Southern has had relatively stable infant death rates over the twelve-year period with a small overall increase from 2.1 to 2.2 deaths per 1000 live births. Southern was the only region to see an increase in infant death rates during 2012-2014, albeit a small one.



Summary

Infant death rates are reducing in New Zealand after a period of little change. This recent reduction is most marked:

- For the 2012-2014 period
- For younger infants (<26 weeks) and especially the very young (<13 weeks)
- For Māori infants
- For Midland infants

Live births are reducing also, with fewer Māori and Total live births for all regions during 2012-2014 compared to 2009-2011.

No attempt has been made to interpret these recent changes.