



Child and Youth Mortality Review Committee

Te Rōpū Arotake Auau Mate
o te Hunga Tamariki, Taiohi

**First Report to the Minister of Health
1 January 2002 to 30 June 2003**

Disclaimer

The Child and Youth Mortality Review Committee prepared the following report.

This report does not necessarily represent the views or policy decisions of the Ministry of Health.

Citation: Child and Youth Mortality Review Committee. 2004. *Child and Youth Mortality Committee: Te Rōpū Arotake Auau Mate o te Hunga Tamariki, Taiohi: First report to the Minister of Health 1 January 2002 to 30 June 2003*. Wellington: Child and Youth Mortality Review Committee.

Published in February 2004 by
Child and Youth Mortality Review Committee
PO Box 5013, Wellington, New Zealand

ISBN 0-478-25809-7 (Book)
ISBN 0-478-25807-0 (Internet)
HP 3696

This document is available on the Committee's website at:
www.newhealth.govt.nz/cymrc



Chair's Introduction

The Child and Youth Mortality Review Committee (CYMRC) is the first established of several possible statutory committees that can be appointed under the provisions of section 18 of the New Zealand Public Health and Disability Act 2000 (the Act). In this unique situation, the Committee has developed a clear vision of its role in New Zealand society, and has identified and begun implementing strategies needed to achieve this vision. We firmly believe that reviewing the systems that surrounded the life and death of children and youth who die needs to be an integral part of how all agencies work together to reduce preventable deaths in the future.

The first year has been mainly planning and development. We have attempted to centralise the currently available information on children and youth deaths, and in doing so have identified some critical shortcomings in the adequacy of information on the circumstances of death of many children and youth. Many of these are identified in the Law Commission's *Report on Coroners*.

In this, the first Annual Report, the CYMRC presents an overview of what we see as the function of the CYMRC and the strategies for future years. We identify for the Minister's consideration recommendations for action that will assist the full establishment of a mortality review system.

We have compiled currently available child and youth mortality data as a baseline for future comparison (Appendix 6). This data shows the scope and trends in child and youth mortality over the last 70 years (in some cases). While improvements have been made in reducing child and youth mortality rates, it is clear that many deaths of New Zealand children and youth may be prevented.

We thank the other government and non-government agencies that have been receptive to, and supportive of, the aims of the Committee. Their support is critical to enable successful mortality review in New Zealand.

The encouragement and support of the Michigan (USA) Mortality Review Program (and especially Teri Covington, Senior Program Director, Michigan Public Health Institute) was critical in determining the direction in which our review system developed.

Reducing preventable deaths in New Zealand's children and youth is our clear vision. We thank the Minister of Health for establishing this Committee and for providing the CYMRC with the opportunity to realise our vision.



Professor Barry Taylor
Chair
Child and Youth Mortality Review Committee

Contents

Chair's Introduction	iii
List of Tables	vi
List of Figures	vi
Executive Summary	viii
1 Establishment Issues	1
1.1 General	1
1.2 Our logo	1
2.3 Activities of the Committee	2
2.4 CYMRC guiding principles	2
2.5 Key policy decisions	3
2.6 Key achievements for 2002	4
3 Issues Identified During the First Year	7
3.1 Lack of consistent high-quality information on deaths	7
3.2 Ensuring sure current knowledge is used versus learning new preventive strategies	7
3.3 Cross Departmental Research Pool (CDRP) bid: 'Environmentally Sensitive Deaths in New Zealand Children and Youth: What are the modifiable factors?'	8
3.4 The place of families in mortality review	8
3.5 The cost of mortality review	9
3.6 Strategic objectives for 2003/2004	9
4 Recommendations for CYMRC Annual Report	10
Appendices	
Appendix 1: Terms of Reference	11
Appendix 2: Membership	14
Appendix 3: Vision and Objectives	15
Appendix 4: Sample Confidentiality Agreement	16
Appendix 5: Mortality Review Data Group Summary	18
Appendix 6: Current Child and Youth Mortality Statistics	20

List of Tables

Table 1:	Ten-year averages for infant, neonatal and post-neonatal deaths and death rates per 1000 live births, 1931–99	21
Table 2:	Neonatal mortality: Causes of death during the first 28 days of life, 1999	22
Table 3:	Ten-year averages of neonatal deaths and death rates per 1000 live births – by ethnic groups, 1931–99	23
Table 4:	Causes of death in the post-neonatal period, 1999	25
Table 5:	Ten-year averages for post-neonatal mortality rate by ethnicity in New Zealand, 1925–1999	26
Table 6:	Causes of death between 1 and 4 years, 1999	29
Table 7:	Causes of death between 5 and 9 years, 1999	31
Table 8:	Causes of death between 10 and 14 years, 1999	33
Table 9:	Causes of death between 15 and 19 years, 1999	35
Table 10:	Causes of death between 20 and 24 years, 1999	37
Table 11:	Total deaths by age group, 1979–1999	38

List of Figures

Figure 1:	Infant, neonatal and post-neonatal mortality rates, 1931–99	21
Figure 2:	Neonatal mortality: Causes of death during the first month of life, 1999	22
Figure 3:	Neonatal mortality rates per 1000 live births – by ethnic groups, 1931–99	23
Figure 4:	Causes of death in the post-neonatal period, 1999	24
Figure 5:	Post-neonatal mortality rate by ethnicity in New Zealand, 1925 to 1999	25
Figure 6:	Post-neonatal mortality deaths in New Zealand by ethnicity, 1970–1999	27
Figure 7:	Death per 100,000 children aged 1 to 4 years in New Zealand, 1979–1999	28
Figure 8:	Māori and non-Māori death rates per 100,000 children aged 1 to 4 years, 1996–99	28
Figure 9:	Causes of death between 1 and 4 years, 1999	29
Figure 10:	Death per 100,000 children aged 5 to 9 years in New Zealand, 1979–1999	30
Figure 11:	Māori and non-Māori death rates per 100,000 children aged 5 to 9 years, 1996–1999	30
Figure 12:	Causes of death between 5 and 9 years, 1999	31
Figure 13:	Deaths per 100,000 children aged 10 to 14 years in New Zealand, 1979–1999	32
Figure 14:	Māori and non-Māori death rates per 100,000 children aged 10 to 14 years, 1996–1999	32
Figure 15:	Causes of death between 10 and 14 years, 1999	33

Figure 16: Death rate per 100,000 youth aged 15 to 19 years in New Zealand, 1979–1999	34
Figure 17: Māori and non-Māori death rate per 100,000 youth aged 15 to 19 years, 1996–1999	34
Figure 18: Causes of death between 15 and 19 years, 1999	35
Figure 19: Death rate per 100,000 aged 20 to 24 years in New Zealand, 1979–1999	36
Figure 20: Māori and non-Māori death rate per 100,000 aged 20 to 24 years, 1996–1999	36
Figure 21: Causes of death between 20 and 24 years, 1999	37
Figure 22: Death rate per 100,000 by age group, 1979–1999	38

Executive Summary

The Child and Youth Mortality Review Committee was established to review and report on deaths of people aged between four weeks and 24 years (children and youth), with a view to reducing the number of deaths occurring in this group.

In the initial set-up year the Committee has outlined its vision, objectives and philosophical approach. The Committee has adapted a system used successfully in Michigan, USA after an assessment of overseas review systems and consideration of what would be possible in the New Zealand setting. This involves a structure based on local mortality review committees, supported by national committee overview, and national data support and analysis, so that both local and national recommendations can be made.

The local committees will be linked to District Health Board areas and involve local agencies that have a child and youth focus. Piloting of the local mortality review committees will commence in 2003/04, and the lessons learned will determine the on-going processes that will ensure efficient and consistent functioning of different local committees. District Health Boards will be asked to provide resources for establishing and maintaining the local mortality review committees.

The guiding principles of the Child and Youth Mortality Review Committee recommend:

- local involvement in mortality review
- expediting reviews by supplying all available information as quickly as possible
- ensuring confidentiality and trust by using a small, multidisciplinary team
- centralised data provision and monitoring of progress.

National data collection, analysis and feedback to both local and national committees will be the function of a Mortality Review Data Group, which will be outsourced after initial development of the database and processes by a development group in the University of Otago.

The lack of consistent, detailed data collection at the investigative stages after a death is the main obstacle at present to ongoing review of child and youth deaths in New Zealand. A new research proposal developed by the Committee and recently funded through the Cross Departmental Research Pool will place health-trained investigators into the coronial investigation for specific kinds of deaths (sudden unexpected deaths of infants and youth suicide).

The purpose of mortality review is to learn lessons about the ways in which deaths might be prevented.

Towards this end, CYMRC make seven recommendations to the Minister of Health.

1 Establishment Issues

1.1 General

The CYMRC met three times in Wellington (February, April, September) and held three teleconferences (January, June and November) during 2002. The chair of the Committee took one-year's sabbatical leave from his employer and worked half-time as a medical advisor to the Ministry of Health in establishing the CYMRC.

During 2003 three meetings will be held in Wellington (February, July and November). The last two of these meetings will be over two days. Two teleconferences are scheduled in May and September, although extra teleconferences may be convened, if necessary, as a cost-effective alternative to meetings in Wellington.

The Ministry of Health provides administrative services and a range of policy advice to the CYMRC.

1.2 Our logo

*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.*

The Deputy Chair, Mr Amster Reedy, provided the Māori lament associated with the logo.

The graphic shows new leaf shoots of the harekeke or New Zealand native flax, emerging from the protective outer parent and grandparent leaves. Strong new leaves and flowers grow from the base of the parent and grandparent leaves. These outer leaves provide protection and sustenance for the tender young new fronds, just as family, whānau and society should protect our vulnerable children and youth.

The CYMRC is very proud of the logo, which makes the vision of the CYMRC visible and produces an immediate impact on any documentation from the CYMRC. We believe that it assists in engaging the interest, hearts and commitment of all involved in this process.

The concept was developed by the Committee, who then commissioned a graphic artist to interpret this design into the logo. A Dunedin graphic artist interpreted this brief into the final design seen here. The artist, Allan Hope, was approached via the parents of a child who had died and was willing to produce the design at minimal cost.

2.3 Activities of the Committee

Our first two meetings reviewed the available information on deaths among the children and youth of New Zealand. Appendix 6 of this report updates the information from 1999 as well as giving the trend over time of these deaths in New Zealand. The data for this review is derived from information held by the New Zealand Health Information Service. This format will be used in future reports to give long term trends that will enable judgements about progress in achieving the prime aim of this committee – the prevention of child and youth deaths.

We also reviewed overseas experience in mortality review for children and youth and came to some critical decisions as to how we could develop an appropriate methodology for the New Zealand context. Comprehensive mortality review of children's deaths is done in most states of the USA, Canada, some states of Australia and for some types of death in the UK. The systems used are generally quite different, some relying on central data collection and analysis without any local involvement, and others using local committees with educated lay involvement. Beth Wood, a member of our Committee, visited and observed some of these committees at work in an overseas visit.

The system in use in the state of Michigan, USA, was personally assessed by the Chairman of this Committee. This state was chosen because it has the most comprehensive mortality review database, including web-enabled systems that we were looking to copy in New Zealand. The Michigan system also uses local committees and national data collection and analysis. The Michigan committee were extremely generous with their time and support, and are very happy for their database to be adapted for use in New Zealand. The CYMRC has formed an ongoing collaboration to adapt and revise the data collection tool. Further information is available at their web site: <http://www.keepingkidsalive.org/>.

2.4 CYMRC guiding principles

The CYMRC has developed four guiding principles.

- Local involvement in mortality review is essential to accurately identify systems issues that are not always easily collected by a national paper-based reporting system.
- Local mortality review committees need to be supplied with all available information as quickly as possible to enable local reviews, if possible, within three months of a death.
- Confidentiality and a robust and trustworthy process run by an identified small, multidisciplinary, multi-agency team are more important than an open system that might allow more people to be involved in the process as an educational opportunity.
- Central processes to provide data must be matched with central processes that measure the process, record the recommendations, and document as far as possible the results of recommendations so that the effects of mortality review can be reported.

2.5 Key policy decisions

The guiding principles provided the basis for key policy decisions. These policy decisions enable consistency for future planning, and signal publicly how we intend the mortality review process to work.

A summary of the key policy decisions is as follows.

1. CYMRC agreed that the role of the CYMRC in the mortality review process would be to:
 - design and implement a common methodology for the reviews undertaken at the local level
 - provide all possible information and support for local mortality committees
 - provide a mechanism by which common issues across the country could be identified and acted upon at a national level
 - report these national issues to the Minister of Health for discussion and action by the Minister and the Minister's caucus colleagues
 - deliver appropriate messages to both local and national systems, when appropriate, in collaboration with involved organisations.

2. CYMRC agreed that reviewing child and youth deaths at a local level would be the best way of reducing preventable deaths.

Establishing mortality reviews at a local level will produce more health benefit than a single national committee reviewing certain types of death.

'Local' is agreed to be the area covered by the District Health Board (DHB) boundaries. CYMRC notes that the DHB boundaries may cut across regional boundaries of other key agencies (eg, police, education, Child, Youth and Family districts). The DHB district was chosen because many children who die are known to health care services. The accountability for funding and managing the mortality reviews rests with the Ministry of Health.

Reviewing child and youth deaths by a multi-agency, multidisciplinary group is likely to lead to improved communication between local agencies involved with children and youth. It should also encourage ownership of improvements to structures and environmental changes that could make the area safer for young people.

After reviewing deaths, a local committee may have recommendations, which they should flag to the CYMRC. These would include the need for improvements at a national level (eg, policy or legislation), or for refinements to processes and structures within government and non-government agencies that would improve outcomes for children and young people.

Mortality reviews are for determining problems or failings with systems or processes, and recommendations will not focus on individual actions. They are *not* courts of inquiry – not for name/blame/shame procedures.

3. CYMRC agreed to pilot mortality review processes in a small number of DHB areas before establishing a nationwide process.

Systematic independent mortality review for a whole section of the population (children and youth) is a new idea. The stakes are high and the benefits to the whole population are large. However, any bad experiences with the process of mortality review, eg, a breakdown in confidentiality arrangements, could rapidly lead to disillusionment and distrust of the process, and failure of the whole mortality review system.

Consequently, the CYMRC developed structures in 2002 aimed at promoting confidence in the processes and piloting the local mortality committee structure and function in a small number of DHBs during 2003. CYMRC has endorsed pilot mortality reviews in Auckland/Waitemata, Otago, Counties Manukau and Tairāwhiti. Lessons from the pilot sites will be shared and used when developing local mortality review committees in other DHBs in 2004/05.

2.6 Key achievements for 2002

2.6.1 Establishing review parameters

The CYMRC agreed that all deaths will be reviewed to some extent by local mortality review committees, and that the local committees will be responsible for the review of deaths of children and youth who live in that region but die out of that region. In-depth reviews are very time consuming. Therefore, local mortality review committees will select which deaths to review in depth by using criteria developed nationally.

The CYMRC has discussed with the New Zealand Association of Paediatric Surgeons the issue of post-surgical deaths in children. As the number of deaths is relatively small and it would appear difficult to get independent review of systems failures with regard to these deaths, we have agreed that when these deaths are identified they will be reviewed by an independent group with expertise in this area. The reviewers will be identified jointly with the New Zealand Association of Paediatric Surgeons.

2.6.2 Establishing mechanisms for review processes

After reviewing the available literature, the CYMRC agreed, as a matter of policy, that local mortality review committees should use 'root cause analysis' methodology when doing an in-depth investigation into factors leading to a child's or youth's death.

This methodology was developed for the health sector by a sector reference group, Standards New Zealand and the Ministry of Health. Guidance in the process is described in a Ministry of Health/Standards New Zealand workbook.¹ Additional published guidelines for reportable events² are available. The Ministry of Health is providing some training to local mortality review committees in the root cause analysis process.

2.6.3 Developing an interface with existing inquiry systems

Some government and non-government agencies undertake reviews when deaths (or serious incidents) occur in services/locations under their jurisdiction. The CYMRC has spent time establishing good working relationships with these agencies, and has developed an understanding of the situations covered by their review processes. Examples of these include the following.

- The Coroners Court – individual coroners and their professional body, the Coroner's Council, have provided an overview of the coronial process. CYMRC has asked all coroners to provide information (eg, preliminary pathologist's report) to the central national database.

¹ Standards New Zealand. *Sentinel Events Workbook: Process for standardised investigation and reporting in the health sector*. Wellington: Standards New Zealand, 2001. This document is available from Standards New Zealand for a small charge. Standard reference is NZS HB 8152:2001.

² Ministry of Health. *Reportable Events Guidelines*. Wellington: Ministry of Health, 2001.

- Land Transport Safety Authority (LTSA) – all road accidents involving fatalities are thoroughly investigated by specialist accident investigators. LTSA make information relating to the deaths of under 25-year-olds available to CYMRC.
- Water Safety New Zealand – undertake specialised reviews for water-related deaths. They make their database of deaths of under 25-year-olds available to CYMRC.
- Discussion is ongoing with Child, Youth and Family (CYF) and initially it is thought that CYF will be asked to identify if they have had contact with children who have died under five years of age, and then give to the Committee a summary of its involvement with these children.

The New Zealand Public Health and Disability Act 2000 enables information to be collected from agencies so that reviews of deaths can be undertaken. Sound working relationships have been formed with the following government agencies, which also provide their information/ databases to CYMRC:

- Birth, Deaths and Marriages (Department of Internal Affairs)
- New Zealand Health Information Service (Ministry of Health)
- Land Transport Safety Authority
- Coroners (Ministry of Courts)
- New Zealand Police.

Non-governmental agencies that have agreed to supply information for reviews are:

- Water Safety New Zealand
- Royal New Zealand Plunket Society (Inc).

The collection, integration and analysis of this data is the work of the Mortality Review Data Group (MRDG). Initial development has been outsourced to the University of Otago, to enable close involvement of the Chairperson of the Committee. The MRDG receive the information from all the above agencies, match records, and integrate them into a secure, web accessible database. The initial data set for this database was based on the Michigan data set but has been extended and developed to meet New Zealand needs. The focus has been on collecting data that directly reflects on known preventable factors for different types of death. An initial report of data held in this database is given in Appendix 5.

2.6.4 Determining functional relationships with new and existing local non-statutory mortality review committees

The CYMRC made contact with the Chief Executives and Child Health Managers of every DHB in order to:

- introduce the CYMRC
- determine the type of mortality review that existed in each area
- maintain ongoing contact with the child health service in each DHB.

The CYMRC asked each child health service to nominate a paediatrician to liaise with the coroner. These paediatricians are being called the 'coronial liaison paediatrician'. We anticipate that this paediatrician will be one of the core people involved in child mortality review in that area. It will be important that they be involved in the coronial investigation, and will co-ordinate and ensure the appropriate medical investigation on the coroner's behalf. They also need to be in close contact and work with the coroner's pathologist.

Another important part of their role is to ensure that the medical, psychological and safety needs of the family and peers of the child who has died are attended to. The liaison paediatrician may not necessarily do all this, but will have responsibility to make sure that the appropriate processes are available within their DHB. Appropriate training for the role of the coronial paediatrician is being planned for 2003/04.

2.6.5 Establishing processes to ensure the security of personal information of the kind referred to in Clause 3, Schedule 5, of the Act

Ensuring the security of personal information has been, and will remain, an ongoing issue. The CYMRC accepts that maintaining confidentiality of information (written, verbal and electronic) is key to the credibility of both the review process and the CYMRC and local committees.

All local committee members will sign a confidentiality agreement (see Appendix 4).

Information will be safeguarded in the following ways:

- The local committee co-ordinator will hold written records in a locked filing cabinet in a locked room.
- Standard computer security messages (eg, passwords) will be used.
- All email that contains any personal information will be encrypted using PGP (pretty good privacy) software. This means email can only be read by the person intended through the use of Public and Private Keys.
- The planned secure web-based database (holding all information from all agencies on the deceased) will be accessible only by a small number of identified computers with a user who has the correct password. It is planned to use Secure Sockets Layer connections (SSL) for the web connections. This involves the encryption of the information transmitted between the web server and the web client, such that it will be unreadable by anyone intercepting it at any point in between. SSL is widely used for on-line financial transactions by banks and companies around the world.
- The Act provides for large fines for person(s) who divulge information gained by their contact with a mortality review process.

2.6.6 Planning to deal with conflict of interest issues among CYMRC members

During 2002 the CYMRC established the parameters for reviews and protection of data. The development of the database and analytical methods have initially been contracted to a group working closely with the Chairperson of the Committee. Once the development phase is complete, and the processes of data collection and analysis better defined, the ongoing running of the system will be more formally outsourced after an open request for proposals from those groups who would have an interest in and capability of providing this. It is currently anticipated that this request for proposals will go out in November 2003.

3 Issues Identified During the First Year

3.1 Lack of consistent high-quality information on deaths

Probably the most critical issue that has become clear during the initial year is the extreme difficulty in New Zealand of getting consistent data of any quality about the deaths of children and youth in New Zealand. Deaths are counted well, but the investigation of these deaths is variable and disconnected. Many of the problems are accurately captured in the Law Commission's August 2000 report 62 on the coroners.

For the half of all child and youth deaths that occur outside hospitals, investigation of the cause and circumstances of death is extremely variable across coronial districts. Both coroners and police may be unaware of the appropriate health issues that need enquiry. For the majority of deaths in the community, there is inadequate assembling of information for a national mortality database. The critical issue is not only that there is no coronial database in New Zealand, but also that people with a health training or background do not collect appropriate information consistently or sensitively.

We believe that consideration should be given to evolving the coronial system into a hybrid between the American medical examiner system and the present English legally based system. It is critical that the investigation of most deaths in children and youth be undertaken with a clear understanding of the social and health issues behind these types of death. The coroners would then be provided with useful information in a consistent manner, which would assist the accurate determination of causes of death. The same information could then move sideways directly into the local mortality review process to inform identification of what systems worked well, and what systems require change.

3.2 Ensuring current knowledge is used versus learning new preventive strategies

The strategy described above will allow us to determine whether current preventive strategies are being appropriately put into place in New Zealand. This is essential knowledge that we currently do not have. To identify new preventive factors and strategies we will need to connect a similar data set on matched children and youth who do not die. This would be new research and not just a quality improvement strategy. The CYMRC has determined that it has an important role in promoting and supporting research that might have a role in identifying new preventive strategies. This philosophy, combined with the difficulties in collecting data identified above, leads to the development of the research proposal described below.

3.3 Cross Departmental Research Pool (CDRP) bid: 'Environmentally Sensitive Deaths in New Zealand Children and Youth: What are the modifiable factors?'

The Cross Departmental Research Pool was established to increase departmental capability to meet the policy advice needs of Ministers. Its objectives are to:

- fund high-quality cross-departmental research, which will support the advancement of the Government's strategic policy priorities
- catalyse new relationships and capabilities within and between departments so that over time departments take responsibility for investment in long-term high-quality research
- develop a portfolio of research activity divided between smaller short-term projects to catalyse new relationships and capabilities, and multi-year large-scale projects to provide key building blocks for the Government's decision-making.

The CYMRC was instrumental in designing an application to this fund which brought together the Ministry of Health, the Ministry of Youth Affairs and the Accident Compensation Corporation (ACC). Support for the project was given from the Department of Courts, the Coroners Council, Te Puni Kōkiri, Child, Youth and Family, Police, and the Ministry of Education. Policy interest in the project was expressed by the Ministry of Social Development and Ministry of Justice.

The proposed project will place health trained investigators into the coronial investigation team for two specific types of death – sudden unexpected deaths (about 80 per year) and youth suicide deaths (about 90 per year). The information collected will go directly to coroners and will also inform the CYMRC. These investigators will also help families to access any health or support services needed. For sudden unexpected deaths they will also ask the same questions (or similar) of four control families, to establish the level of risk associated with specific environmental and social exposures that might then inform direct intervention at the population level.

Evaluation of the family's experience of the investigation will inform the decisions on whether this resource is needed as an ongoing part of the coronial system in New Zealand. Evaluation of their role and the projects methods of collecting, collating and analysing data will inform the recommended development of a nationwide coronial database. Accurate information provided to mortality review committees will enable accurate assessment of system failures and identification of appropriate remedies.

The Committee has heard that this bid has in fact been successful, and planning for its implementation is proceeding.

3.4 The place of families in mortality review

One of the critical questions most parents and families ask after the death of their child is, 'Why did our child die?'. This is often accompanied by, 'Is there anything that could be done to make sure that other children do not die like this in the future?'

The purpose of mortality review is to learn lessons about the ways in which deaths might be prevented. For many of the types of death of New Zealand children and youth, the behaviour of families will be key to effective prevention. Thus, working in partnership with New Zealand families to protect the lives of children and youth is central to the vision of the CYMRC. Consequently, there is considerable discussion about the place of families in the developing methodology for reviewing child and youth deaths in New Zealand.

Questions being considered include families' potential role in providing information for mortality review, either as part of routinely collected data or personal testimony, and how recommendations from the Committee that may relate to the individual child's death can be given to parents without compromising the confidentiality of much of the information, which would have been given to the review process by involved professionals.

The views of consumer groups are being sought to guide the development of methodology in this area.

3.5 The cost of mortality review

The Ministry of Health has provided central administrative, analytical and legal support, for which we are very grateful. They also paid for the half-time clinical salary of the Chair (January 2002 to January 2003) – the majority of which time was spent on development of the mortality review process. CYMRC has no capacity to provide financial support for the local co-ordination of mortality review processes, or for members or chairs of local mortality review committees. In general, the central processes are being set up to support local review, given that for most professionals (health or social), involvement in this most core of all quality assurance processes would be an expected part of normal work practice. Indeed, it is argued that such reviews would be expected as part of the function of all District Health Boards.

Our initial surveys indicated that there was variation in the nature and extent of mortality review undertaken by District Health Boards. Many of which expressed a desire to extend and develop their mortality review processes. We recognise in asking District Health Boards to be part of mortality review we are asking them to contribute resources. We also appreciate in the current funding context where no new funds are made available for local mortality reviews that District Health Boards are asked to see this as a core quality assurance activity.

For the future, the pilot sites for local mortality review will identify the full functioning costs of the local mortality reviews. We anticipate that District Health Boards will then request specifically targeted extra money for this local mortality review process before it can be instituted in every District Health Board.

3.6 Strategic objectives for 2003/2004

These include:

- piloting review sites over 2003/04 (four sites)
- supporting the development of perinatal and maternal mortality review systems.
- developing specific prevention messages for the public
- maintaining close ongoing liaison with the coronial investigation system and with the proposed changes to the coronial legislation.

4 Recommendations for CYMRC Annual Report

The Child and Youth Mortality Review Committee ask the Minister of Health to:

1. **Note** that the CYMRC are endeavouring to collect, in a central mortality database, complete and accurate data on every child and youth that dies in New Zealand. Analysis of this data will enable the development of preventive strategies that are grounded on a solid evidential base.
2. **Note** the varying nature and extent of data at coronial level limits the ability to undertake robust, in depth mortality reviews. This might be resolved with the establishment of the role of health-trained investigator who would collect information for both the Coroner and local mortality review committees.
3. **Note** that the CYMRC support the establishment of a coronial information system.
4. **Note** that the CYMRC recognise the need for a working group drawing members from the Ministry of Justice, Department for Courts, Police, Coroners' Council, ACC and Ministry of Health as well as members of the CYMRC. This purpose of this group will be to develop protocols that authorise the collection of standardised and consistent data for different types of child and youth deaths. This group could also take overall responsibility for the 'CDRP project' (see (5) below).
5. **Note** the CYMRC proposal for a Cross Departmental Research Pool (CDRP) bid was successful (advised of funding in April 2003). This bid is called 'Environmentally Sensitive Deaths in New Zealand Children and Youth: What are the modifiable factors?'. This project will evaluate the role of a health-trained investigator who would collect information for both the Coroner and the mortality review process. This will involve undertaking a case-control study for sudden unexpected deaths in infants (SUDI) and case study of youth suicides. The study runs for three years. Funding for the planning stages is currently being sought. Ministry of Health is the project sponsor. CDRP funding will provide \$0.93 million over three years for the project.
6. **Note** that the CYMRC will request senior advisors to the committee from the Police Commissioner's Office, Commissioner for Children, Ministry of Education, and District Health Boards (via District Health Boards New Zealand). An advisor from the Coroner's Council (Dr Murray Jamieson) presently attends CYMRC meetings.
7. **Note** that establishing local mortality review committees relies on the support and resourcing from District Health Boards. The Crown Funding Agreement with District Health Boards needs to be modified to require child and youth mortality review (as part of a national process) to be one of the quality assurance activities undertaken by District Health Boards. Currently four pilot sites are identifying the resources required at a District Health Board level. The identified costs may be a significant barrier to implementation of child and youth mortality review across the country.

Appendix 1: Terms of Reference

The role of the Committee

The Child and Youth Mortality Review Committee is a ministerial committee appointed under section 18 of the New Zealand Health and Disability Act 2000 (the Act). The Child and Youth Mortality Review Committee is established by and accountable to the Minister of Health.

The Child and Youth Mortality Review Committee's functions are to:

- review and report to the Minister on deaths of people aged between four weeks and 24 years, with a view to reducing the numbers of deaths of this group, and to continuous quality improvement through the promotion of ongoing quality assurance programmes
- advise on any other matters related to mortality that the Minister from time to time specifies in any further notice to the Committee.

During its first year of operation, the Child and Youth Mortality Review Committee must address establishment issues including:

- establishing review parameters
- establishing mechanisms for review processes
- developing an interface with existing inquiry systems
- determining functional relationships with new and existing local non-statutory mortality review committees
- establishing processes to ensure security of personal information of the kind referred to in Clause 3 of Schedule 5 of the Act
- how the Committee plans to deal with conflict of interest issues among its members.

As part of its functions under Section 18 of the Act the Child and Youth Mortality Review Committee is required to:

- at least annually, deliver to the Minister a report on its progress in carrying out its functions
- develop strategic plans and methodologies in line with the functions above that:
 - (a) are designed to reduce morbidity and mortality
 - (b) are relevant to the Committee's functions.

The intended composition of the Committee

The Child and Youth Mortality Review Committee will have a maximum of 10 members appointed by the Minister of Health. One of these members will be from the Ministry of Health and one from the Department of Children, Youth and Family Services. The Chief Executives of these organisations will nominate an appropriate member who is then appointed by the Minister.

Desired qualifications of the members and of the Committee

Members will have the ability to work strategically and will have credibility in relevant communities.

Collectively the Committee will reflect the following:

- knowledge of mortality review systems
- knowledge of issues affecting children and youth
- knowledge of epidemiology, research, specific skills and health systems
- cultural expertise.

Aside from the Ministry of Health and the Department of Child, Youth and Family, membership will be drawn from a range of disciplines and contexts including clinicians, health service providers, child and youth advocacy groups, and people representing Māori and Pacific peoples' interests.

The Committee may bring in other specialists or professionals with relevant expertise, to help the Committee meet its functions, within its budget.

Terms of Committee members

Members of the Committee will be appointed for a term of up to three years. Members will be eligible to serve a second consecutive term to allow for continuity and the full use of increased experience and knowledge. Members will have staggered retiring dates to ensure a degree of continuity.

Performance measures

The Committee will be effectively meeting its key tasks when it carries out its functions collaboratively and provides relevant, excellent quality advice on time.

The Committee will agree a work programme with the Minister within its budget, and must achieve its agreed work programme.

The Committee must stay within its allocated budget.

Reporting requirements

The Child and Youth Mortality Review Committee is required to:

- report as necessary, but at least once a year, to the Minister of Health on the progress with its key tasks as required in section 18(3). The report is to include the Committee's rationale for its advice and any relevant evidence and/or documentation, as well as a summary of the consultation carried out in meeting its tasks
- keep a record of all Committee meetings, which outlines the issues discussed, and includes a clear note of any decisions taken or recommendations made.

Frequency of meetings

The timing and frequency of meetings will be determined by the tasks the Committee is obliged to fulfil and as part of its work programme to be agreed with the Minister.

Servicing of the Committee

The Ministry of Health will provide secretarial and analytical services to the Child and Youth Mortality Review Committee. The costs of the secretarial staff will be met from within Ministry of Health baselines, not from the Committee's budget.

The appointments process

Conflicts of interest

Members must perform their functions in good faith, honestly and impartially and avoid situations that might compromise their integrity or otherwise lead to conflicts of interest. If Committee members are conflicted, they must step aside from the decision-making process.

Confidentiality

Members must note the statutory requirements in section 18(7), which prevent disclosure of information of the kind described in Clause 3 of Schedule 5, of the Act. Under this clause, 'information' means any information:

- (a) that is personal information within the meaning of section 2(1) of the Privacy Act 1993
- (b) that became known to any member or executive officer or agent of a mortality review committee only because of the committee's functions being carried out (for example, because it is contained in a document created, and made available to the member or executive officer or agent, only because of those functions being carried out), whether or not the carrying out of those functions is completed.

Mortality review committees are subject to the Ombudsmen Act 1975. This will allow persons from whom information is required by the Chairperson to object to the Ombudsman if they believe there are not good grounds for the request. Mortality review committees are subject to the Ombudsman investigations for decisions of mortality review committee chairs requiring information under Clause 2 of Schedule 5 of the Act, but are not subject to the Official Information Act 1982.

Treaty of Waitangi

The Committee shall undertake its tasks in a manner consistent with the principles of the Treaty of Waitangi.

Fees and allowances

Members of the Child and Youth Mortality Review Committee are entitled to be paid fees for attendance at meetings. The level of fees are set in accordance with the State Service Commission's framework for fees for statutory bodies. The Chairperson will receive \$520 per day working for the Committee (plus half a day's preparation fee) and an allowance of two extra days per month to cover extra work undertaken by the chair. The attendance fee for members is set at \$320 per day working for the Committee (plus half a day's preparation fee). The actual and reasonable travel and accommodation expenses of the Child and Youth Mortality Review Committee will be met from the Committee's budget.

This document was authorised by

Hon Annette King
MINISTER OF HEALTH
6 July 2001

Appendix 2: Membership

Name	City/town	Date of original appointment	Expiry date of present term
Mrs Carol Everard	Auckland	Date notice gazetted	21 September 2003
Dr Ian Hassall	Auckland	Date notice gazetted	21 September 2004
Dr Patrick Kelly	Auckland	Date notice gazetted	21 September 2003
Ms Shannon Pakura	Wellington	Date notice gazetted	21 September 2004
Dr Teuila Percival	Auckland	Date notice gazetted	21 September 2004
Mr Amster Reedy (Deputy Chair)	Wellington	Date notice gazetted	21 September 2003
Professor Barry Taylor (Chair)	Dunedin	Date notice gazetted	21 September 2004
Dr David Tipene-Leach	Gisborne	Date notice gazetted	21 September 2004
Dr Pat Tuohy	Wellington	Date notice gazetted	21 September 2004
Dr Peter Watson	Auckland	Date notice gazetted	21 September 2004
Mrs Beth Wood	Wellington	Date notice gazetted	21 September 2004
Dr Jane Zuccollo	Wellington	Date notice gazetted	21 September 2004

Appendix 3: Vision and Objectives

Vision

To reduce the number of preventable deaths in New Zealand children and youth.

To work in partnership with Māori communities.

Objectives

To:

1. monitor the number and types of deaths that occur in children and youth over time
2. educate the public about the usefulness of and need for mortality review
3. encourage the establishment, effective functioning and nationwide co-ordination of local mortality review committees
4. provide information to local mortality review committees that assists the review process and encourages local responses to reduce the risk of death for children and youth
5. create links and interact with community and organisational networks, in particular those in Māori, Pacific and other communities with a high child and youth mortality
6. collect from all relevant sources information that will identify preventable factors or systems failures that could be improved, both locally and nationally
7. conduct specific time-limited investigations into particular types of child and youth deaths that will identify specific actions that can be taken at both local and national levels that will prevent child and youth deaths
8. produce an annual report to the Minister of Health outlining our results and making recommendations for actions that will reduce child and youth deaths
9. be effective advocates for the improvement of health and social services for children and youth where these actions have a direct bearing on reducing child and youth deaths
10. sponsor, support and promote research that will identify new factors that will prevent child and youth deaths.

Appendix 4: Sample Confidentiality Agreement

A local mortality review committee can use this confidentiality agreement as a basis for their confidentiality agreement.

Confidentiality Agreement

The **New Zealand Child and Youth Mortality Review Committee** (the Committee) reviews and reports to the Minister of Health on the deaths of children and youths with a view to reducing the numbers of deaths.

The Committee will [has] established 21 child and youth mortality review committees (the local committees) with support from District Health Boards to act as its **agents**. The local committees will review and report to the Committee on the deaths of local children and youths and will make recommendations as to practice at a local level.

Under the New Zealand Public Health and Disability Act 2000 (the Act) the Chairperson or an agent of the Committee may, by notice in writing, require a person to give the Committee information in that person's possession or under that person's control. The meaning of 'information' is defined in Clause 3, Schedule 5, of the Act.

For the purposes of this agreement '**information**' means:

- personal information (as defined in the Privacy Act 1993) about an identifiable individual and including information relating to a death that is maintained by the Registrar-General pursuant to the Births, Deaths, and Marriages Registration Act 1995, or any former Act
- information that has become known to you only because of the Committee's functions being carried out, whether or not the carrying out of those functions is completed.

Schedule 5 also places statutory limits on the disclosure of information by the Committee. The Committee (and its agents) cannot disclose that information unless for the purposes of the Committee carrying out its functions or with a Ministerial authority in accordance with the Act.

Section 18 of the Act provides that a person who **discloses information** contrary to Schedule 5:

- is liable on summary conviction to a maximum fine of \$10,000
- if a member of a registered occupational profession, is liable to disciplinary proceedings of that profession.

I, [full name] agree and undertake that I:

- will not disclose any information to any person other than in accordance with the provisions of the New Zealand Public Health and Disability Act 2000, or unless otherwise authorised in accordance with law or as required by law
- will use my best endeavours to prevent the unauthorised disclosure of information and to keep all documents containing information secure
- have read the statutory provisions of the New Zealand Public Health and Disability Act 2000 attached to this agreement
- have read and understood the above confidentiality statement and agree to be bound by its terms.

Signed

Organisation

Date

Appendix 5: Mortality Review Data Group Summary

The Mortality Review Data Group was set up with the aim of developing the mechanisms by which information from multiple government and non-government agencies is collected, collated and analysed. The data group will be actively involved in presenting this information to local mortality review committees, collecting further information from these committees, and recording any recommendations for system changes at both the local and national level.

Once development of these processes is clear and a clear specification produced, a request for proposals to run this system will be advertised. In the initial development stage, this work has been done under the direct guidance and involvement during the sabbatical year of Professor Barry Taylor. This task has been facilitated by the half-time involvement of Ms Melissa Carter BSc, MPH currently in the Department of Women's and Children's Health, Dunedin School of Medicine, University of Otago. The database development has used the resources available through Information Technology Services of the University of Otago.

Below is the report on activity during 2002 of the Mortality Review Data Group.

During the months April to December 2002 we obtained the following data for the whole of 2002.

NZHS

Data on 528 deaths – 513 deaths with NHI numbers and a further 15 without an NHI. Data supplied electronically at irregular intervals. Received via courier on PC disk with passwords. This data will be standardised and received monthly as of 1 January 2003.

Data arrives in the form of 24 tables including 10 code tables, therefore 14 tables containing data as well as a spreadsheet containing the data for people who have died under the age of 25 years without an NHI.

Table	Number of cases in table
Aliases	345
Baby2	127
Cancers	32
Deaths	513
Delivery diagnosis	978 (contains multiple records per person)
MHINC: diagnosis details	109 (contains multiple records per person)
MHINC: discharge details	155 (contains multiple records per person)
Gravida2	124
MHINC: healthcare user details	63 (contains multiple records per person)
MHINC: legal status details	95 (contains multiple records per person)
Medical warnings	42 (contains multiple records per person)
Morbidity	2630 (contains multiple records per person)
NHI	513
MHINC: service provided details	291 (contains multiple records per person)
No NHI	15

* MHINC refers to the mental health files.

LTSA

Data on 115 deaths. Email is received on a monthly basis with an 'Excel' spreadsheet attached. This is saved and imported into the existing 'Access' database. At the same time a fax is received with the original forms and the names of the deceased are entered into the database. An NHI number is then looked up via the Children's Outpatient database and entered into the Access database.

Coroners' Court files

Data on 143 deaths. Data from the coroners' files is received by email as an 'Access' file every month. The whole file is received and any new cases are imported into our database. NHIs are then found using the Children's Outpatients database and entered into our database.

Water Safety New Zealand

Data on 27 deaths for 2002 from a larger file of 1326 deaths in water since 1980. File received via email on 25 November 2002 in an 'Excel' spreadsheet. Spreadsheet imported in 'Access' database. NHI numbers then looked up in the Children's Outpatients database and entered into database.

Police

Data on 13 deaths. Data received on 13 August 2002 as 'Word' documents. Programme written which extracted fields from 'Word' document into 'Access' database. NHIs found from Children's Outpatients database and entered into our database.

Data matching

Data linked through Access using NHI numbers. If no NHI number supplied then the name, gender, and date of birth (or age if known) is used to directly query the NZHIS NHI Database.

Appendix 6: Current Child and Youth Mortality Statistics

The CYMRC has reviewed available child and youth mortality figures and historical trends in New Zealand. These figures are derived from information collected and kept by the New Zealand Health Information Service (NZHIS). These have been available as public reports since the 1930s. Usually official information on these matters is reported on average three years after the completion of each year.

The first report of the CYMRC presents NZHIS data that gives an outline of the major causes and rates of death in New Zealand's children and youth in defined age groups over the last 20 years.

We have included deaths in the first month of life for the sake of completeness, even though it is not currently in the brief of this committee to review those deaths.

Infant mortality (deaths in the first year of life)

The infant mortality rate is the total number 52-week or less infants. The infant mortality rate (expressed as number of deaths per 1000 live births) is a statistic frequently used to compare the standard of services provided in different countries.

The infant mortality figure is a total of:

- neonatal mortality – deaths in the first four weeks of life. This is a reasonable overall measure of the maternal obstetric and neonatal intensive care services
- post-neonatal mortality – deaths from 5–52 weeks of life. This is a measure of the preventive works done with mothers and families before and after birth, and includes the psychosocial environment that they live in.

Trends for all three rates are shown below with the first, infant mortality, showing overall how well we have done over time.

Figure 1: Infant, neonatal and post-neonatal mortality rates, 1931-99

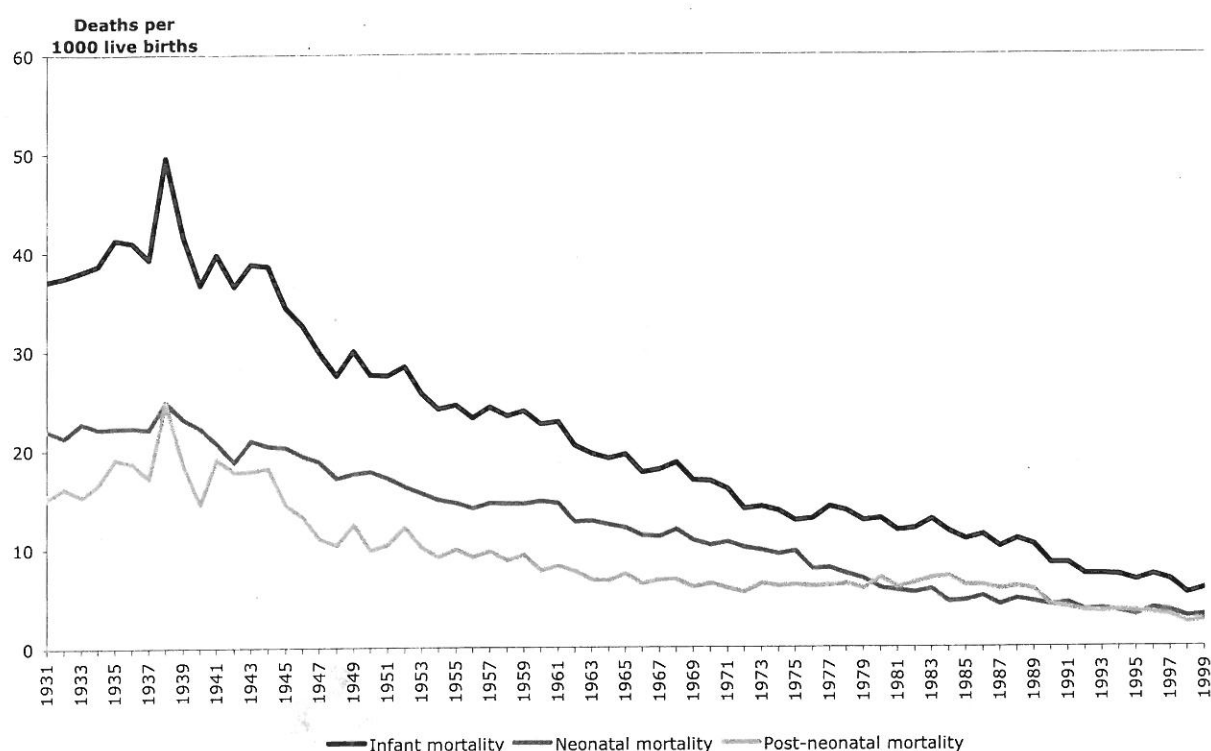


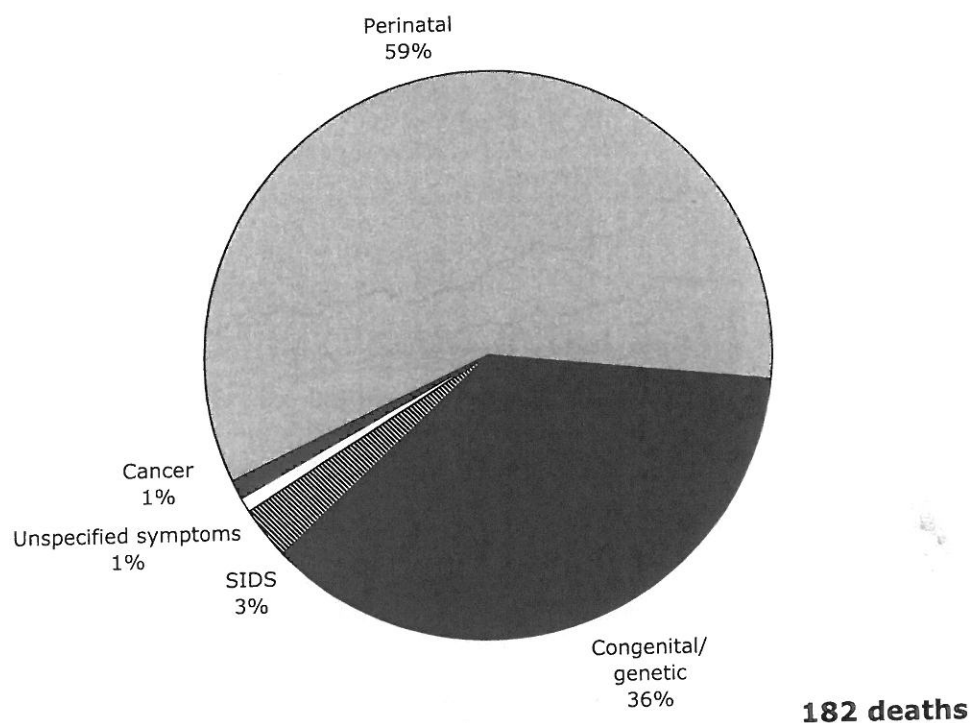
Table 1: Ten-year averages for infant, neonatal and post-neonatal deaths and death rates per 1000 live births, 1931-99

Year	Infant deaths	Infant rate	Neonatal deaths	Neonatal rate	Post-neonatal deaths	Post-neonatal rate
1931-40	1196	40.1	672	22.5	524	17.6
1941-50	1442	33.6	830	19.2	611	14.4
1951-60	1390	24.8	849	15.1	540	9.6
1961-70	1188	19.0	753	12.0	436	7.0
1971-80	845	13.8	493	8.6	351	6.2
1981-90	591	11.0	264	4.9	327	6.1
1991	507	8.5	264	4.4	239	4.0
1992	433	7.3	219	3.7	214	3.6
1993	431	7.3	224	3.8	207	3.5
1994	414	7.2	203	3.5	211	3.7
1995	388	6.7	184	3.2	204	3.5
1996	417	7.3	223	3.9	194	3.4
1997	389	6.7	207	3.6	182	3.2
1998	309	5.4	173	3.0	137	2.4
1999	334	5.8	181	3.2	153	2.7

Neonatal mortality (0–28 days)

By far the majority of neonatal deaths are related to problems at the time of birth, either deaths related to prematurity or asphyxia neonatorum. The majority of these deaths occur in hospital.

Figure 2: Neonatal mortality: Causes of death during the first month of life, 1999



Source: NZHIS

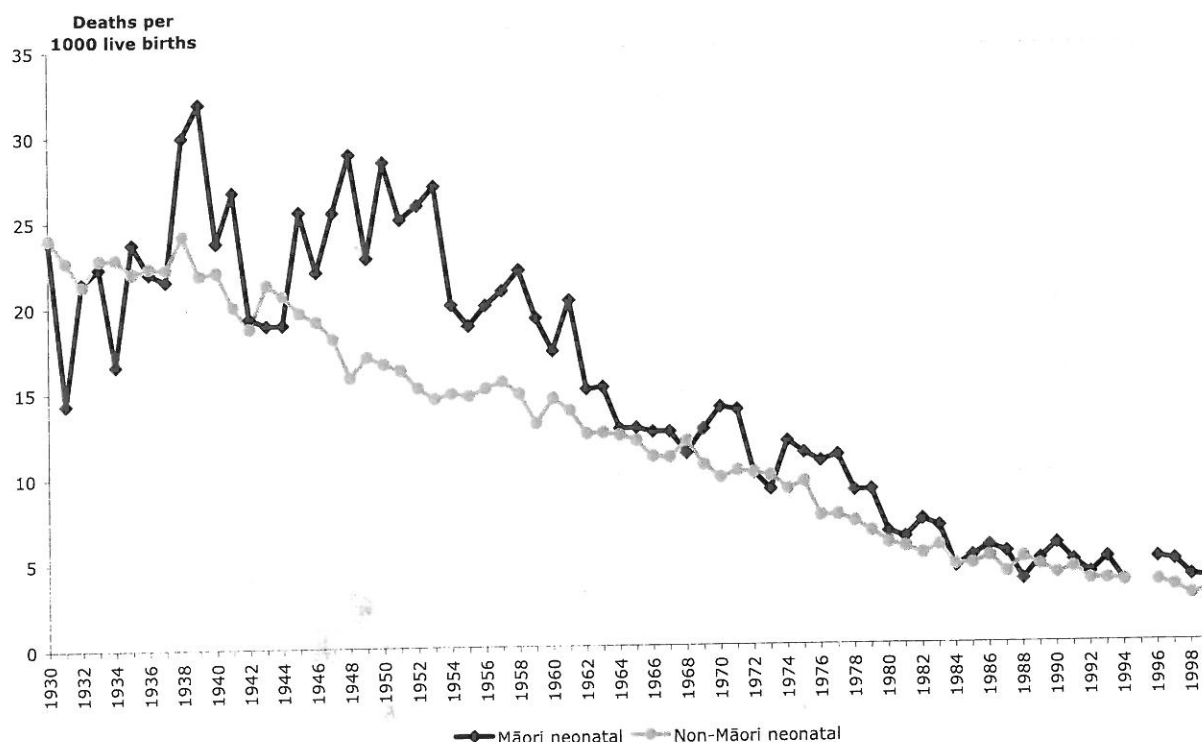
Table 2: Neonatal mortality: Causes of death during the first 28 days of life, 1999

Cause	Number of deaths
Perinatal	108
Congenital/genetic	65
SIDS	5
Unspecified symptoms	2
Beds/suffocation	0
Infection	0
Cancer	1
Ext injury/accident	0
Other	1
TOTAL	182

Source: NZHIS

Neonatal mortality by ethnicity

Figure 3: Neonatal mortality rates per 1000 live births – by ethnic groups, 1931–99



Source: NZHIS

Table 3: Ten-year averages of neonatal deaths and death rates per 1000 live births – by ethnic groups, 1931–99

Year	Māori deaths	Māori rate	Non-Māori deaths	Non-Māori rate
1931–40	81	22.7	592	22.4
1941–50	112	23.7	718	18.7
1951–60	132	21.6	743	14.8
1961–70	111	13.9	642	11.7
1971–80	73	10.2	421	8.3
1981–90	37	5.5	228	4.9
1991	33	4.8	231	4.4
1992	29	4.0	190	3.7
1993	35	4.9	189	3.7
1994	25	3.5	178	3.5
1995				
1996	77	4.9	146	3.5
1997	77	4.7	133	3.2
1998	55	3.8	117	2.7
1999	60	3.7	121	2.9

Source: NZHIS

Post-neonatal mortality (28 days to one year)

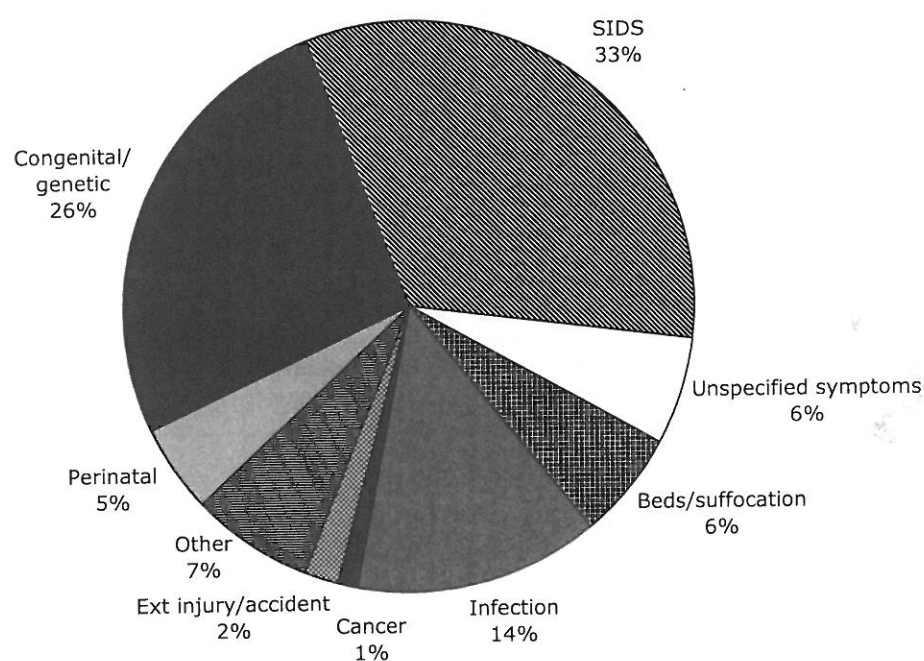
The majority of these deaths occur outside hospital. Numerically, the largest group remains Sudden Infant Death Syndrome (SIDS). This number would potentially be larger if the deaths now labelled beds/suffocation were included in the SIDS category, as they probably have been in previous years. The identification, by Coroners and pathologists that some infants died of suffocation by reason only of having been found in bed with their parents, is of concern. Previously, these babies would have been considered as dying of SIDS.

By comparison with other countries, at least 61% of deaths in this age group are likely to be highly preventable. Simple strategies have been shown to be effective in reducing the post-neonatal mortality rate. These include:

- placing infants on their back to sleep
- avoidance of maternal smoking in pregnancy
- the avoiding bed sharing when there is any maternal smoking in the pregnancy.

From 2003 onwards, the CYMRC will ask the local mortality review committees to focus on supplying information regarding these risk factors in some detail.

Figure 4: Causes of death in the post-neonatal period, 1999



182 deaths

Source: NZHIS

Table 4: Causes of death in the post-neonatal period, 1999

Cause	Number of deaths
Perinatal	10
Congenital/genetic	48
SIDS	58
Unspecified symptoms	11
Beds/suffocation	11
Infection	26
Cancer	2
External injury/accident	4
Other	12
Total	182

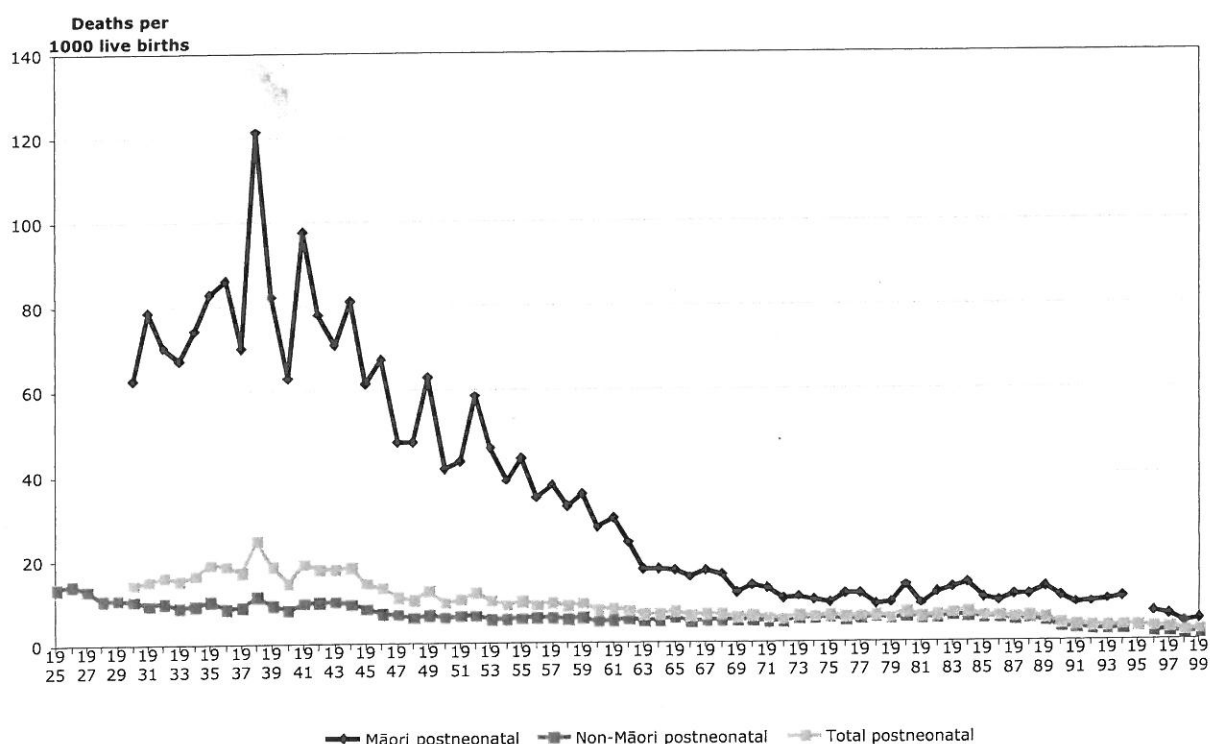
Source: NZHIS

Post-neonatal mortality and ethnicity

The earliest records available in New Zealand for this data are available from 1925 and are shown in the next figure.

Māori post-neonatal mortality was very high in the 1930s and 1940s with up to 1 in 10 Māori infants dying in their first year of life. There was significant improvement between 1940 to 1970. The change in definition of ethnicity in 1996 gives a false impression of reduced Māori mortality between 1990 and 1998. Despite this, rates for Māori remain double that for non-Māori.

Figure 5: Post-neonatal mortality rate by ethnicity in New Zealand, 1925 to 1999



Source: NZHIS

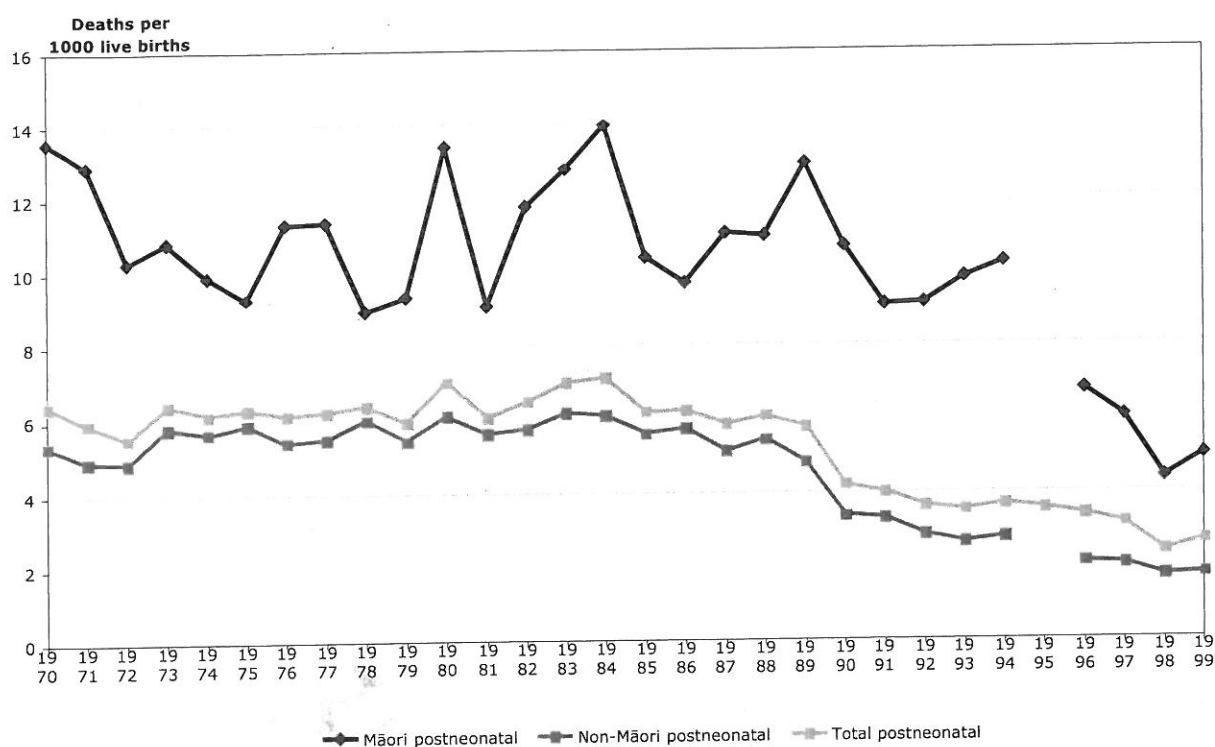
Table 5: Ten-year averages for post-neonatal mortality rate by ethnicity in New Zealand, 1925-1999

Year	Māori deaths	Māori rate	Non-Māori deaths	Non-Māori rate
1925			381	13.5
1926			407	14.3
1927			360	12.9
1928			292	10.7
1929			290	10.8
1930	136	62.6	280	10.5
1931-40	276	79.7	248	9.4
1941-50	305	65.7	307	8.1
1951-60	241	39.7	299	6.0
1961-70	143	17.9	293	5.4
1971-80	76	10.8	275	5.6
1981-90	75	11.3	251	5.4
1991	63	9.1	175	3.3
1992	66	9.1	148	2.8
1993	70	9.8	137	2.7
1994	72	10.2	139	2.8
1995				
1996	107	6.8	87	2.1
1997	98	6.0	84	2.0
1998	63	4.4	74	1.7
1999	80	5.0	73	1.8

Source: NZHIS

The following figure and table show a more detailed and recent view of post-neonatal mortality since 1970.

Figure 6: Post-neonatal mortality deaths in New Zealand by ethnicity, 1970–1999



Source: NZHIS

Child mortality (1–14 years)

Child mortality measures the number of deaths in children aged 1–14 years.

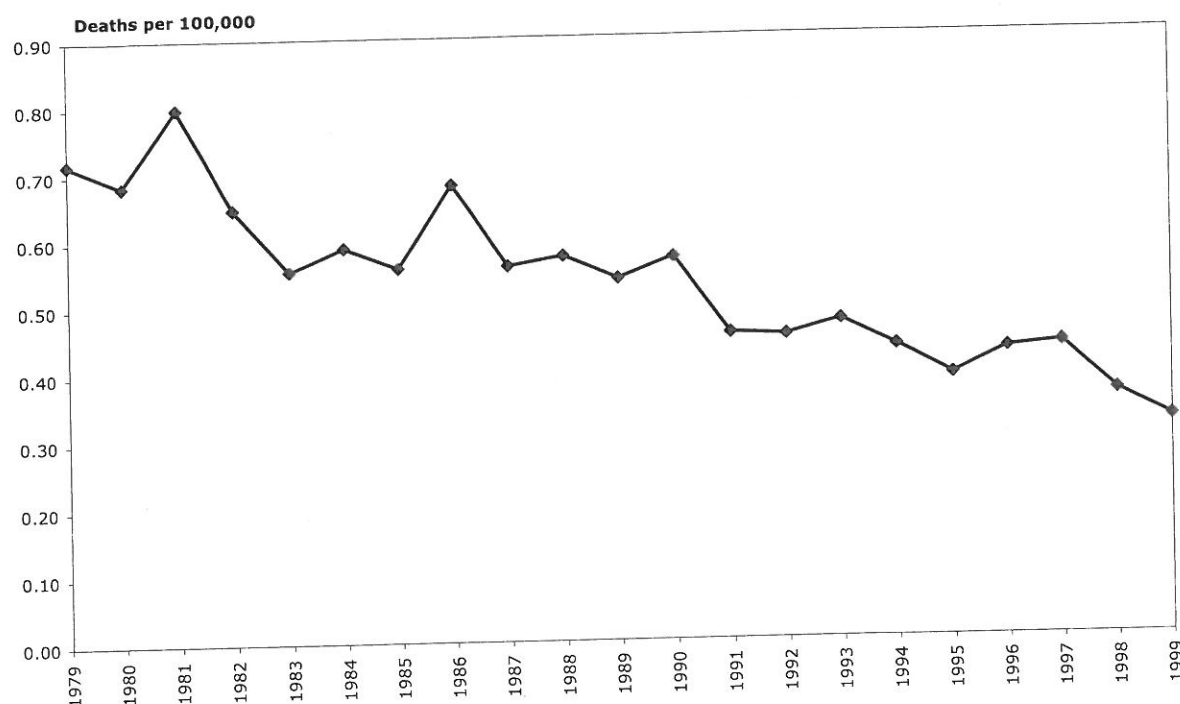
The figures and tables following indicate the leading causes of deaths for children and youth in New Zealand.

The figures and tables are shown in age bands:

- 1–4 years
- 5–9 years
- 10–14 years.

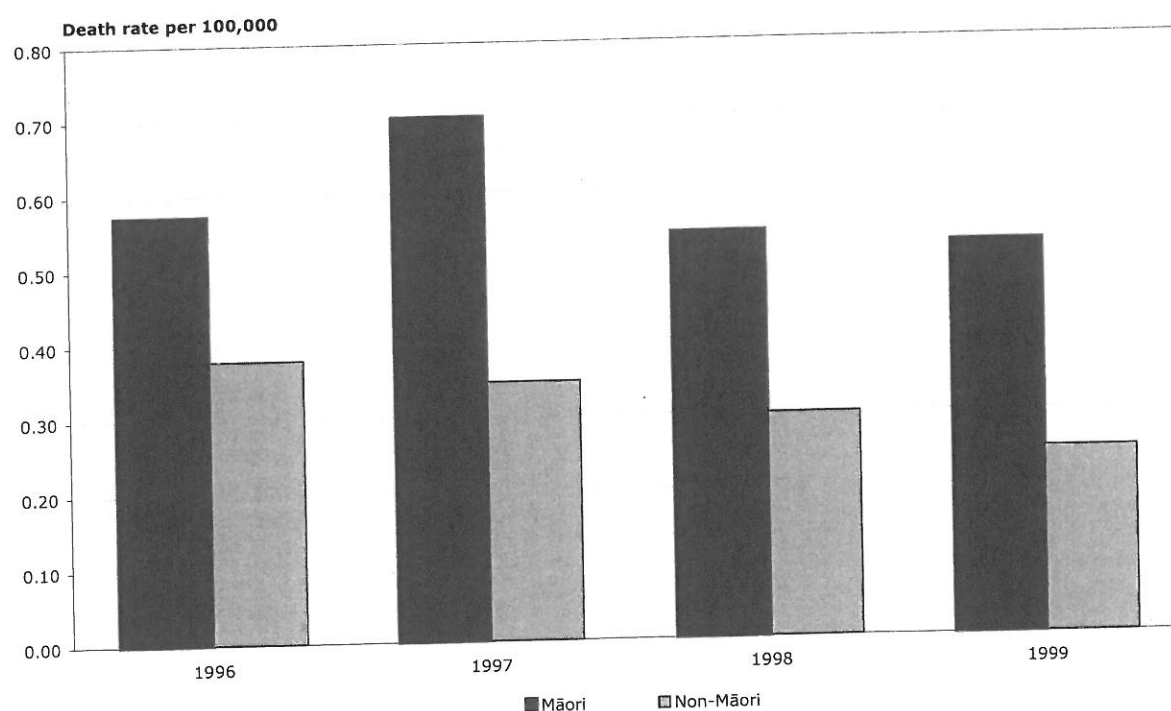
1-4 years

Figure 7: Death per 100,000 children aged 1 to 4 years in New Zealand, 1979-1999



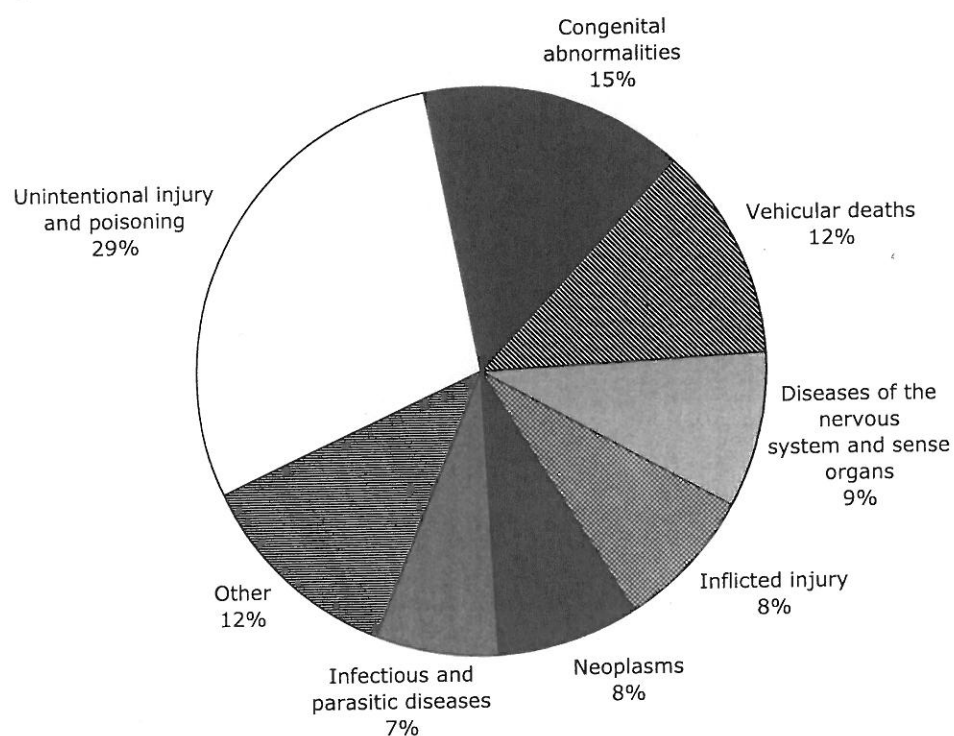
Source: NZHIS

Figure 8: Māori and non-Māori death rates per 100,000 children aged 1 to 4 years, 1996-99



Source: NZHIS

Figure 9: Causes of death between 1 and 4 years, 1999



74 deaths

Source: NZHIS

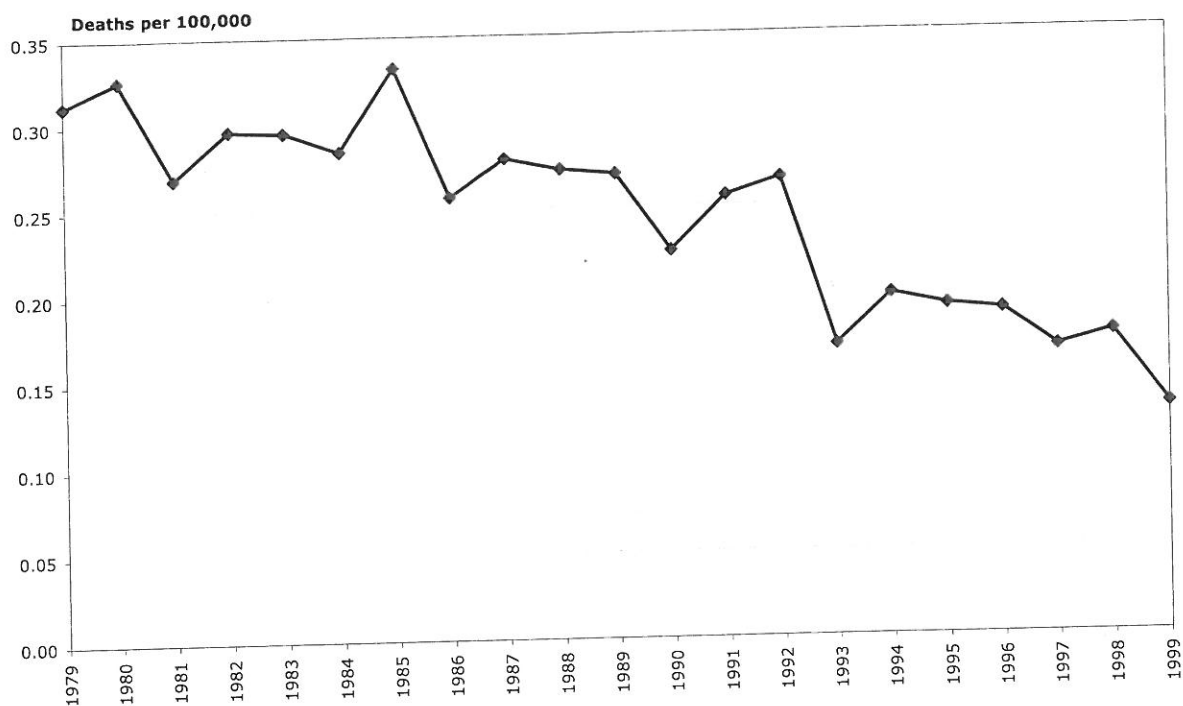
Table 6: Causes of death between 1 and 4 years, 1999

Cause of death	Number of deaths
Unintentional injury and poisoning	21
Congenital anomalies	11
Vehicular deaths	9
Diseases of the nervous system and sense organs	7
Inflicted injury	6
Neoplasms	6
Infectious and parasitic diseases	5
Other	9
TOTAL	74

Source: NZHIS

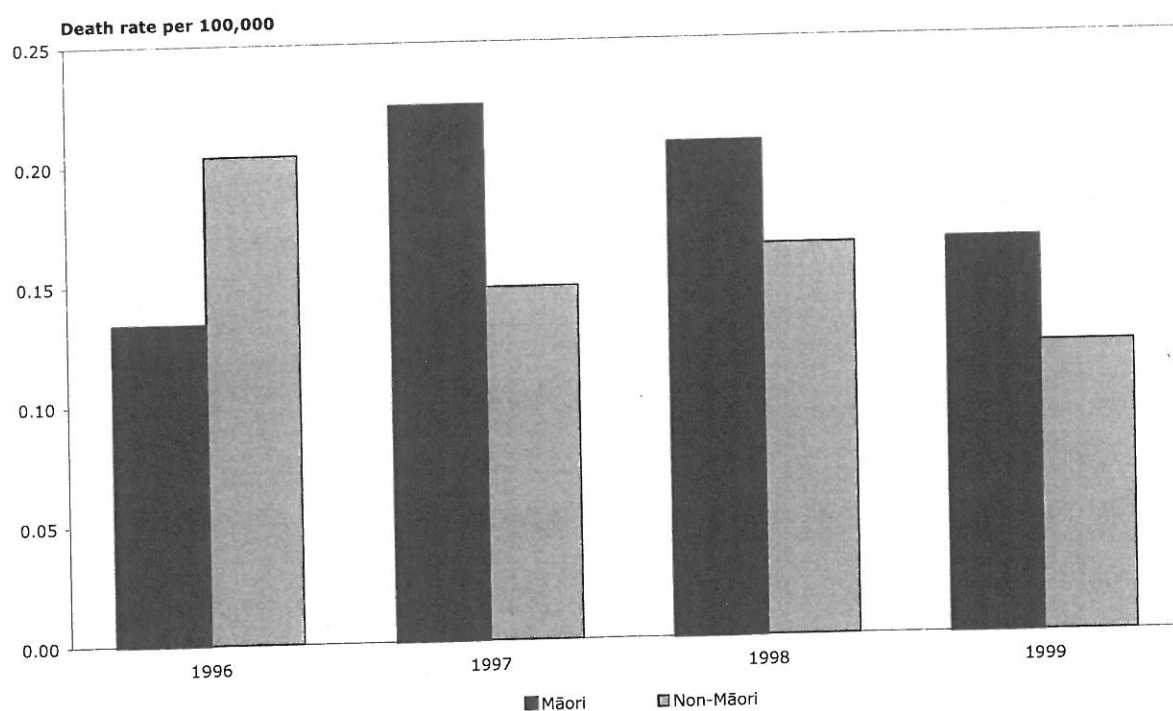
5-9 years

Figure 10: Death per 100,000 children aged 5 to 9 years in New Zealand, 1979-1999



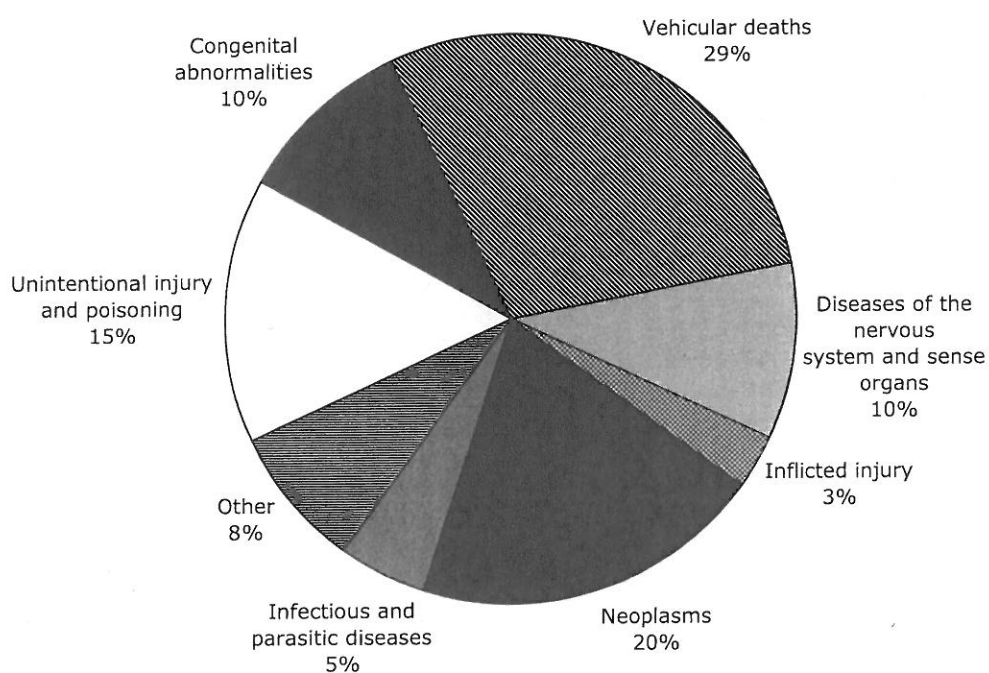
Source: NZHIS

Figure 11: Māori and non-Māori death rates per 100,000 children aged 5 to 9 years, 1996-1999



Source: NZHIS

Figure 12: Causes of death between 5 and 9 years, 1999



40 deaths

Source: NZHIS

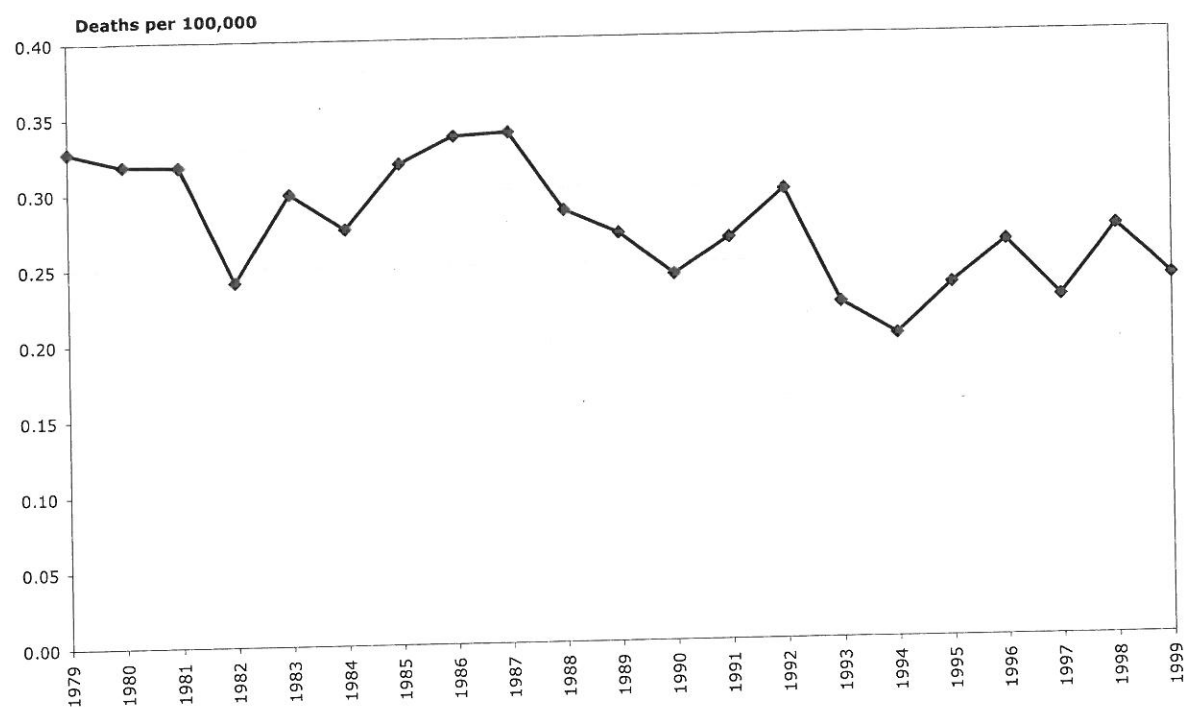
Table 7: Causes of death between 5 and 9 years, 1999

Cause of death	Number of deaths
Vehicular deaths	12
Neoplasms	8
Unintentional injury and poisoning	6
Diseases of the nervous system and sense organs	4
Congenital anomalies	4
Infectious and parasitic diseases	2
Inflicted injury	1
Other	3
TOTAL	40

Source: NZHIS

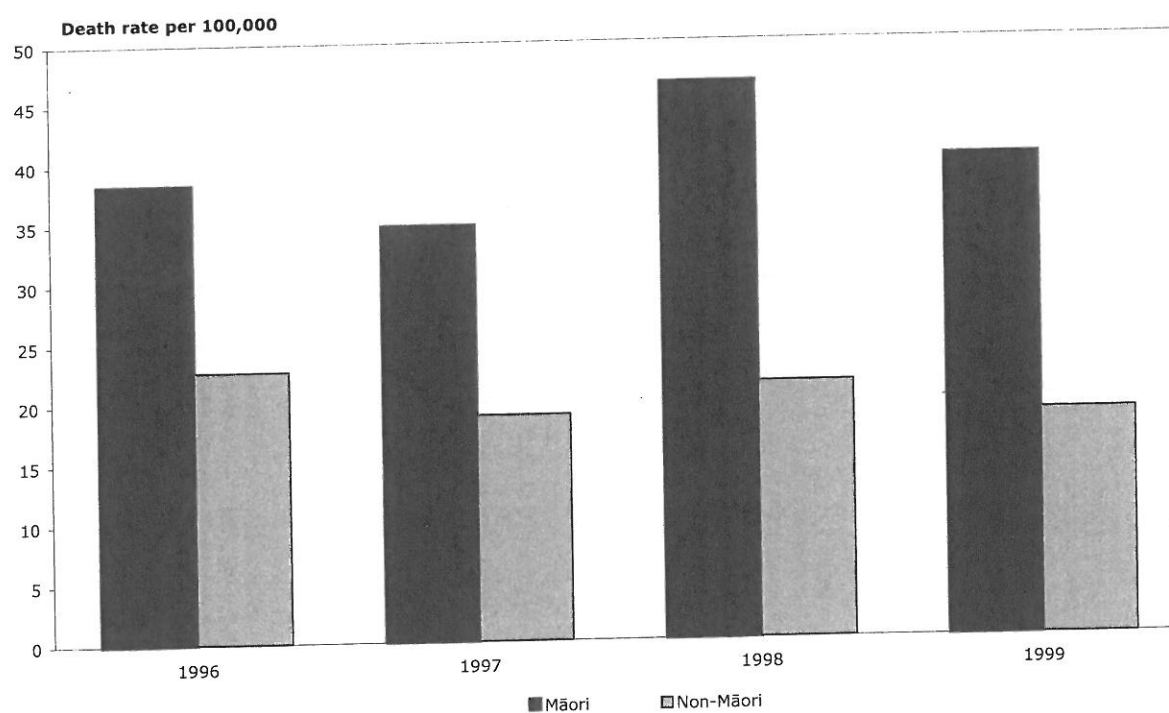
10-14 years

Figure 13: Deaths per 100,000 children aged 10 to 14 years in New Zealand, 1979-1999



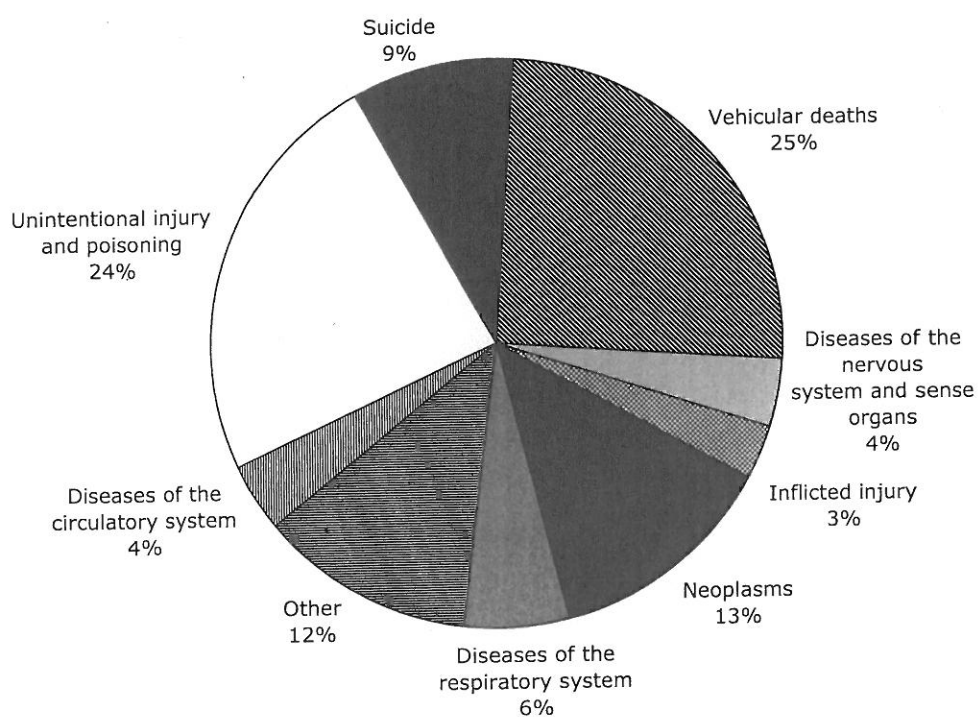
Source: NZHIS

Figure 14: Māori and non-Māori death rates per 100,000 children aged 10 to 14 years, 1996-1999



Source: NZHIS

Figure 15: Causes of death between 10 and 14 years, 1999



67 deaths

Source: NZHIS

Table 8: Causes of death between 10 and 14 years, 1999

Cause of death	Number of deaths
Vehicular deaths	16
Unintentional injury and poisoning	16
Neoplasms	9
Suicide	6
Diseases of the respiratory system	4
Diseases of the nervous system and sense organs	3
Diseases of the circulatory system	3
Inflicted injury	2
Other	8
TOTAL	67

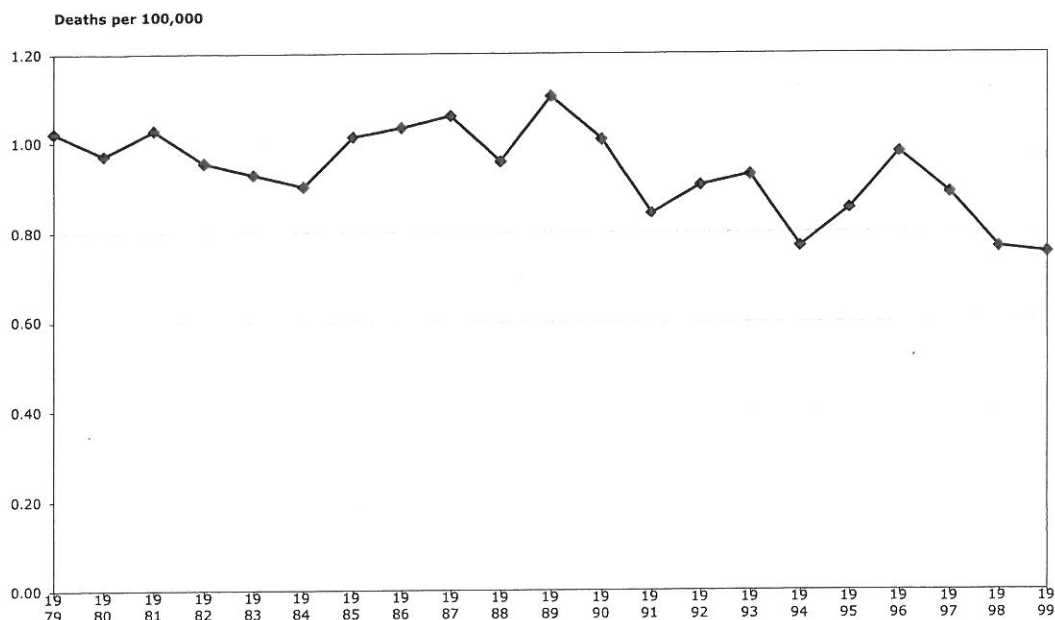
Source: NZHIS

Youth mortality (15–24 years)

The figures for youth mortality are shown in two bands: 15–19 years and 20–24 years.

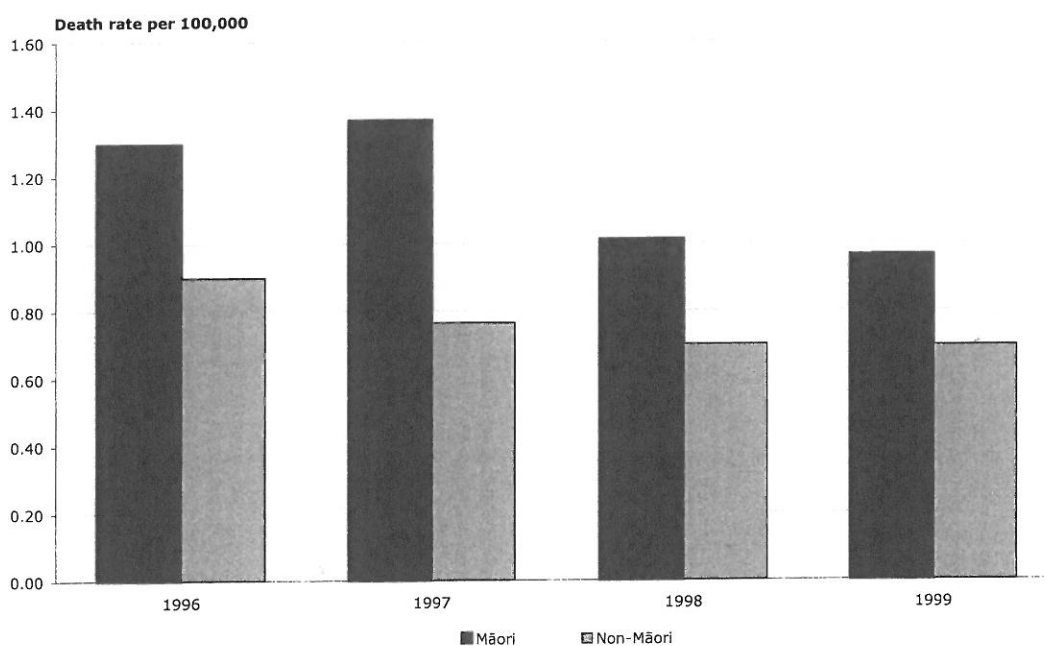
15–19 years

Figure 16: Death rate per 100,000 youth aged 15 to 19 years in New Zealand, 1979–1999



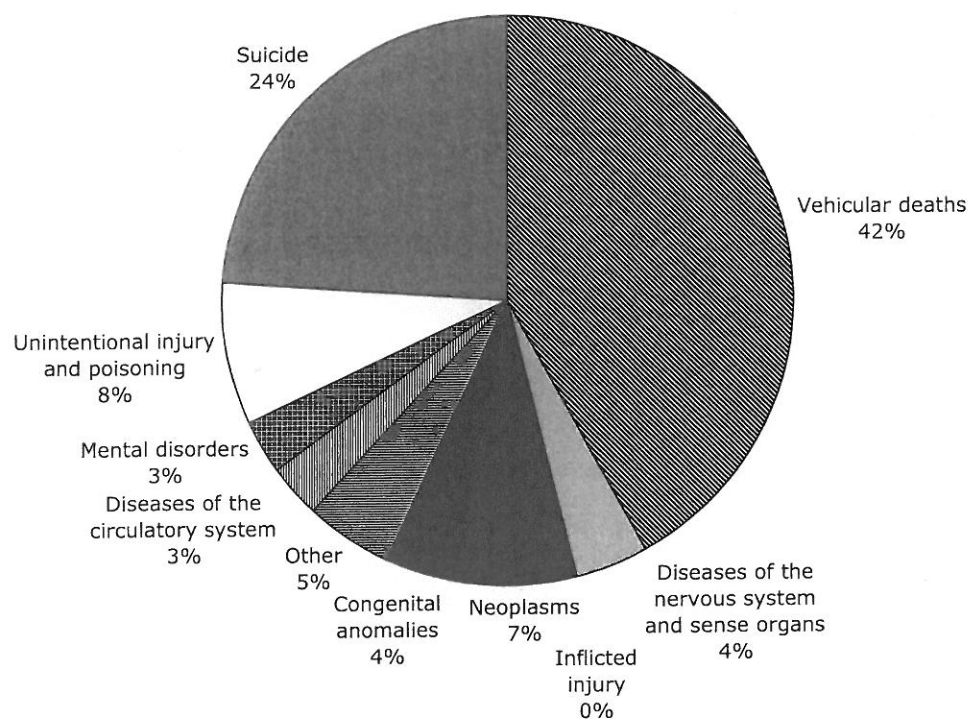
Source: NZHIS

Figure 17: Māori and non-Māori death rate per 100,000 youth aged 15 to 19 years, 1996–1999



Source: NZHIS

Figure 18: Causes of death between 15 and 19 years, 1999



204 deaths

Source: NZHIS

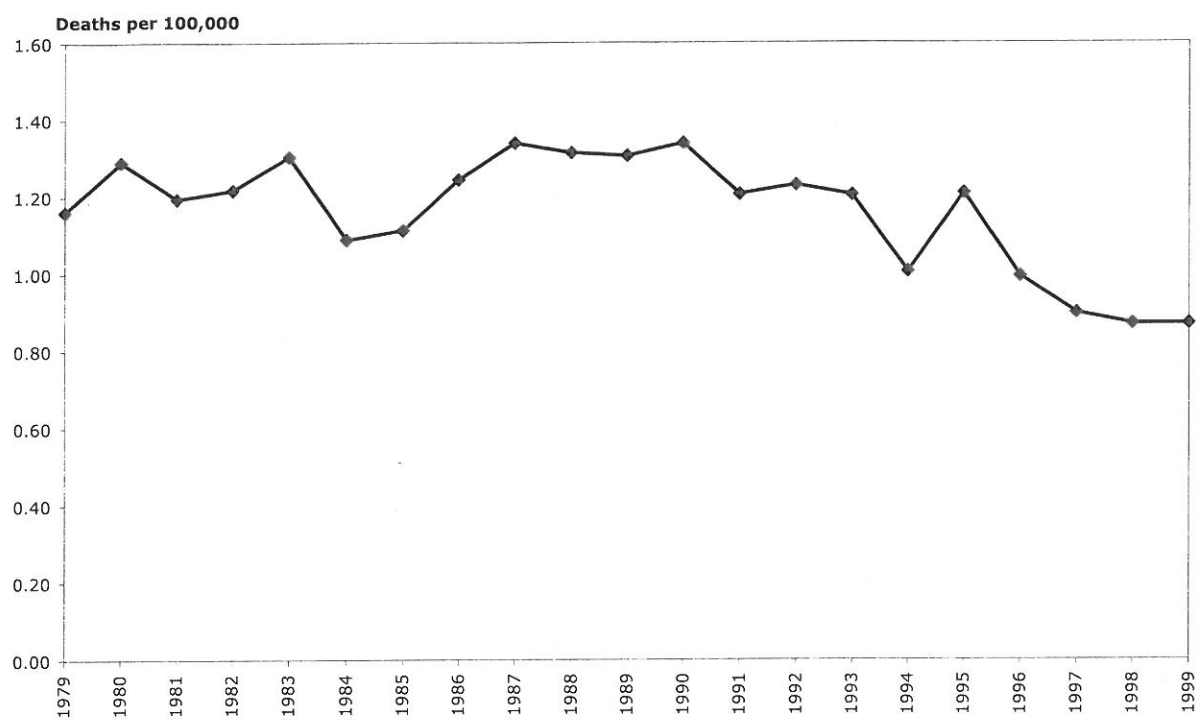
Table 9: Causes of death between 15 and 19 years, 1999

Cause of death	Number of deaths
Vehicular deaths	85
Suicide	48
Unintentional injury and poisoning	16
Neoplasms	15
Diseases of the nervous system and sense organs	9
Congenital anomalies	8
Mental disorders	6
Diseases of the circulatory system	6
Inflicted injury	1
Other	10
TOTAL	204

Source: NZHIS

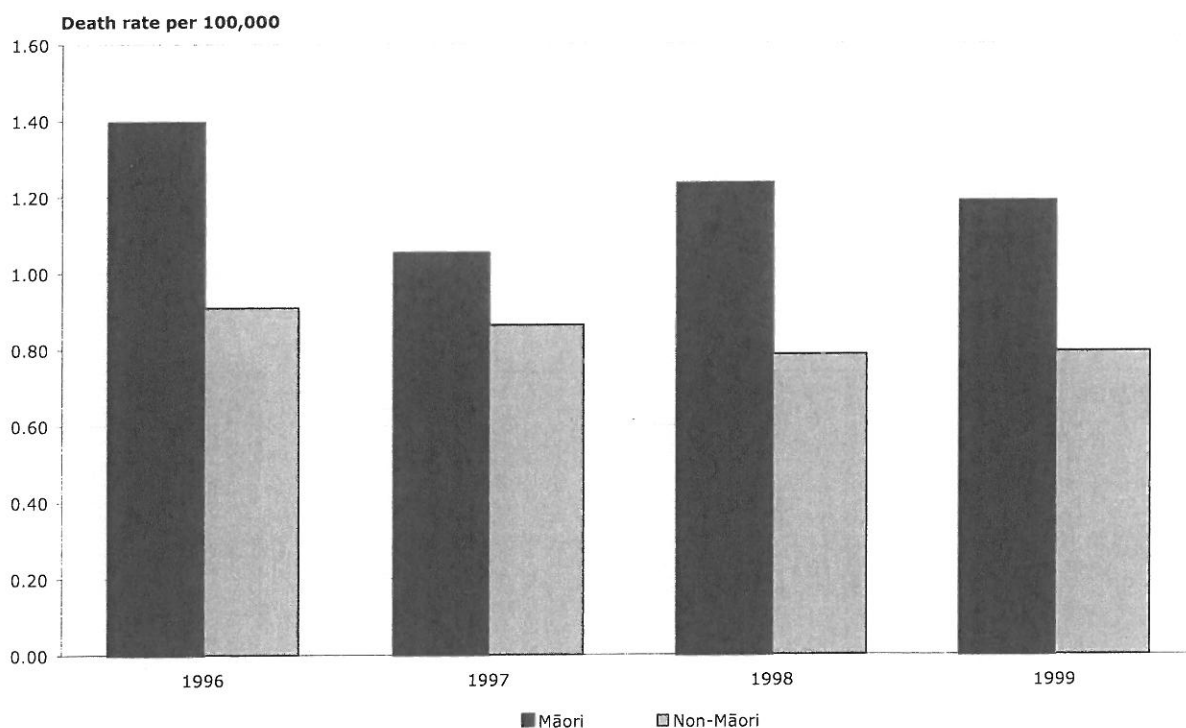
20–24 years

Figure 19: Death rate per 100,000 aged 20 to 24 years in New Zealand, 1979–1999



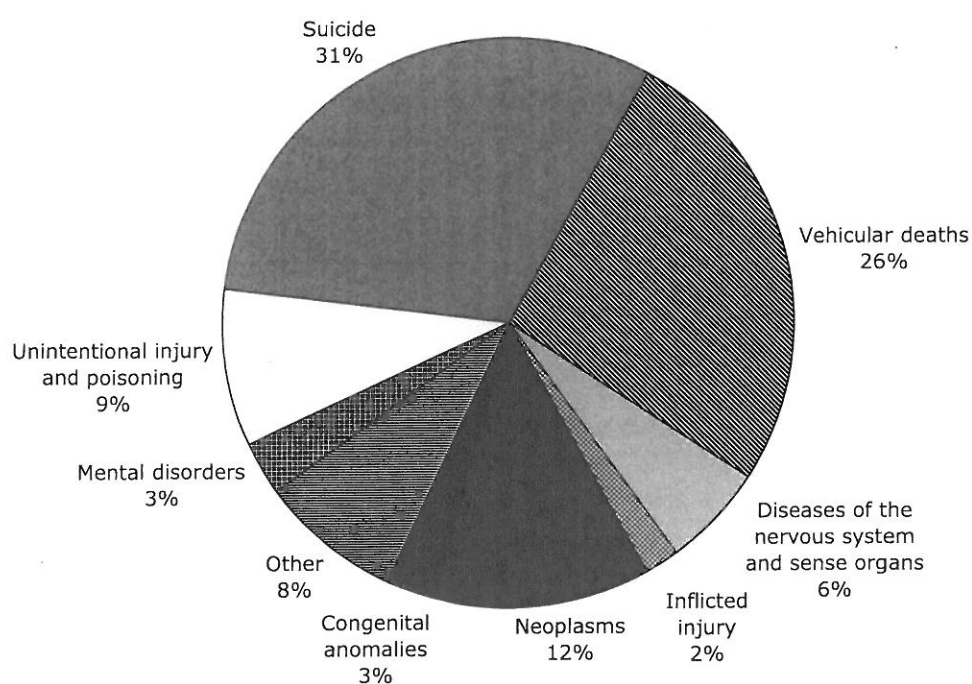
Source: NZHIS

Figure 20: Māori and non-Māori death rate per 100,000 aged 20 to 24 years, 1996–1999



Source: NZHIS

Figure 21: Causes of death between 20 and 24 years, 1999



226 deaths

Source: NZHIS

Table 10: Causes of death between 20 and 24 years, 1999

Cause of death	Number of deaths
Suicide	72
Vehicular deaths	60
Neoplasms	27
Unintentional injury and poisoning	20
Diseases of the nervous system and sense organs	13
Mental disorders	6
Congenital anomalies	6
Inflicted injury	5
Other	17
TOTAL	226

Source: NZHIS

Figure 22: Death rate per 100,000 by age group, 1979–1999

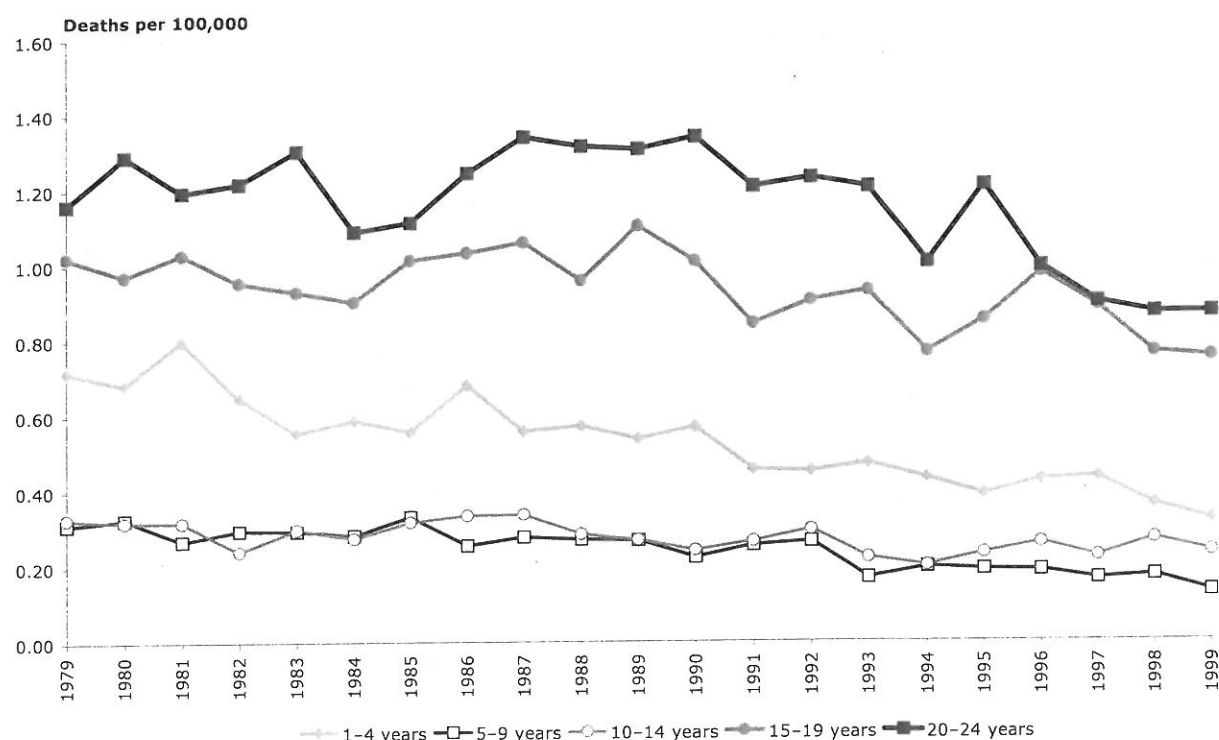


Table 11: Total deaths by age group, 1979–1999

Year	1-4	5-9	10-14	15-19	20-24
1979	149	95	99	322	303
1980	138	96	96	305	344
1981	160	77	97	315	326
1982	129	82	74	288	343
1983	111	79	92	279	381
1984	118	74	84	272	323
1985	112	85	95	308	326
1986	135	65	97	312	351
1987	112	70	94	325	375
1988	116	68	76	295	364
1989	111	67	70	335	360
1990	120	56	62	299	375
1991	99	64	68	241	328
1992	102	68	75	249	341
1993	109	44	56	250	338
1994	102	53	51	203	283
1995	92	53	60	225	338
1996	95	54	69	257	270
1997	102	50	61	240	245
1998	85	53	75	207	231
1999	74	40	67	204	226

Summary

- The infant, neonatal and post-neonatal mortality rates have all greatly decreased over the last 60 years.
- The leading causes of death in neonates (0–28 days) in 1999 were perinatal causes (58%) followed by congenital/genetic (36%).
- Māori and non-Māori neonatal death rates have been similar since the mid-1980s.
- The leading causes of post-neonatal deaths (1–12 months) in 1999 were SIDS (33%) followed by congenital/genetic causes (26%).
- The non-Māori post-neonatal death rates have been consistently lower than Māori post-neonatal death rates since 1930, and although the gap between Māori and non-Māori has greatly decreased, a real difference still exists.
- The child and youth death rates in each age group have decreased since 1979. In all age groups non-Māori children and youth have lower mortality rates than Māori children and youth.
- The main causes of death in 1–4 year olds in 1999 were unintentional injury and poisoning (29%) followed by congenital anomalies (15%) and vehicle accidents (12%).
- In children aged 5–9 and 10–14 the three major causes of death in 1999 were vehicle accidents, unintentional injury and poisoning, and neoplasms.
- In youth aged 15–19 and 20–24 the two major causes of death in 1999 were vehicle accidents and suicide. In both of these age groups these two causes combined accounted for over half of the deaths.
- Those aged 15–24 are most at risk of death, and those aged 5–14 are at least risk.
- Mortality rates have been decreasing in all age groups, but ethnic discrepancies still exist in all age groups.