
Tony Blakely, Bridget Robson, Martin Tobias, Shilpi Ajwani, Martín Bonne

www.wnm eds.ac.nz/nzcms-info.html
Overview

• Problem - undercounting Māori and Pacific deaths
• Solution - New Zealand Census-Mortality Study
• Results:
  – life expectancy trends by ethnicity
  – age-specific and cause-specific mortality trends
• Possible explanations - structural, health services and epidemiological and risk factors
• Where to next?
Routine calculation of death rates

**Death records**

Numerator: Work out number of **deaths** in each:
- sex
- age group
- occupational class
- ethnic group

Divide numerator by denominator to get mortality rates for each group of interest

**Census records**

Denominator: Work out number of **people** in each:
- sex
- age group
- occupational class
- ethnic group
## Ethnicity data collection

<table>
<thead>
<tr>
<th>Census data</th>
<th>Mortality data</th>
</tr>
</thead>
</table>
| 1981: ‘biological’, multiple groups allowed | Prior to September 1995:  
| 1986: self-identified ethnic origin | • biological  
| 1991: self-identified ethnicity | • only 2 categories: Maori, Pacific  
| 1996: self-identified ethnicity, more encouragement of multiple self-identity | • sole categories only permitted  
| 2001: revert back to 1991 question | After September 1995, identical questions to 1996 census (query implementation) |
Impact on ethnic mortality rates

- Up to September 1995 Māori and Pacific deaths undercounted and European deaths over-counted
- Consequently:
  - Māori mortality rates underestimated ++
  - Pacific mortality rates underestimated +++
  - European mortality rates slightly overestimated
NZCMS as the solution

Death records

Census records

Mortality records linked back to a census record to create a cohort study
# Comparing census and mortality data ethnicity, 1991-94

<table>
<thead>
<tr>
<th>Census ethnicity</th>
<th>Death registration ethnicity</th>
<th>Total</th>
<th>Census to mortality ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maori</td>
<td>Pacific</td>
<td>non-M</td>
</tr>
<tr>
<td>Sole</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Maori</td>
<td>3,117</td>
<td>6</td>
<td>1,449</td>
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<tr>
<td>Pacific People</td>
<td>9</td>
<td>621</td>
<td>471</td>
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<tr>
<td>non-M non-P</td>
<td>351</td>
<td>30</td>
<td>35,262</td>
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<tr>
<td>Total</td>
<td>3,471</td>
<td>657</td>
<td>37,182</td>
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</table>
Unlock ratios 1981-1999

<table>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>1.16</td>
<td>1.32</td>
<td>1.32</td>
<td>1.07</td>
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<tr>
<td>Pacific People</td>
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<td>1.76</td>
<td>1.68</td>
<td>0.99</td>
</tr>
<tr>
<td>Asian</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.02</td>
</tr>
<tr>
<td>non-M non-P / non-A</td>
<td>0.98</td>
<td>0.97</td>
<td>0.96</td>
<td>0.99</td>
</tr>
</tbody>
</table>

1981-84: mortality compared to census 1/2 or more Māori and Pacific
1986-89 and 1991-94: mortality compared to census *sole* Māori and Pacific
1996-99: mortality *prioritised* compared to census *prioritised* Māori, Pacific, Asian and nM nP
Method to calculate mortality rates

- Used ‘appropriate’\(^1\) NZCMS unlock ratios to correct 20 years of mortality data
- Calculated ethnic mortality trends for both *sole* and *prioritised* series
- Grouped data as:
- Both mortality rate and life expectancies

1. Different adjustment ratios were used depending on whether the sole or prioritised series was being calculated.
Limitations

• The mortality rates for each period apply to the corresponding census’s definition of ethnicity:
  – comparisons over time not exactly comparable, particularly for 1990-95 to 1996-99
  – however, use of both sole and prioritised series gives alternative series

• Still some underlying inaccuracy in adjustment, particularly Pacific people in 1980s
RESULTS
Impact of adjusting for numerator-denominator bias

**Unadjusted**

**Adjusted**

*Graph showing standardised male mortality rates (Prioritised) for different years and adjusted vs. unadjusted data.*
Life expectancy: males, prioritised

- 1980-84
- 1985-89
- 1990-95
- 1996-99
Life expectancy: females, prioritised
Mortality rates by age: sexes combined, prioritised

1-14 year olds

15-24 year olds

25-44 year olds

45-64 year olds

65-74 year olds

Maori
Pacific
non-Maori non-Pacific
Cancer mortality rates: prioritised
Cardiovascular and respiratory mortality rates: prioritised
Injury and suicide mortality rates: prioritised
Age substituted life expectancy

Cause-substituted life expectancy
Cause deleted life expectancy

**Male (Prioritised Maori)**

- **Years**: 0, 1, 2, 3, 4
- **Causes**: Cancer, Diabetes, CVD, Respiratory disease, Injuries, Other

**Female (Prioritised Maori)**

- **Years**: 0, 1, 2, 3, 4
- **Causes**: Cancer, Diabetes, CVD, Respiratory disease, Injuries, Other
Key findings for Pacific people

• Downward trend in all-cause mortality rates up to 25 years of age, but static at older ages
• Cancer, cardiovascular disease and diabetes related mortality cause disparity compared to non-Māori non-Pacific
• Intermediary between Māori and non-Māori non-Pacific
• Stroke mortality high
• Breast cancer and male lung cancer now high
• Staggering increase in colorectal cancer mortality
Pacific (prioritised) rate ratios by sex and age
## Pacific rate ratios by cause of death

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<td></td>
<td></td>
<td></td>
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<tr>
<td>Lung cancer</td>
<td>0.4</td>
<td>1.3</td>
<td>0.9</td>
<td>1.5</td>
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<tr>
<td>Breast cancer</td>
<td>0.6</td>
<td>1.5</td>
<td>1.1</td>
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<tr>
<td>Colorectal cancer</td>
<td>0.1</td>
<td>0.2</td>
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<tr>
<td>IHD</td>
<td>1.0</td>
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<td>Stroke</td>
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<tr>
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<tr>
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<td>0.9</td>
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<td>0.3</td>
<td>0.6</td>
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Female Standardised Mortality Rates
Cancer

Sole Māori
Māori Ethnic Group
Other (excl Pacific)
Male Standardised Mortality Rates
Ischaemic Heart Disease

- Sole Māori
- Māori Ethnic Group
- Other (excl Pacific)
Mortality rates 45-64 years

- Sole Māori
- Māori Ethnic Group
- Other (excl Pacific)
Key findings for non-Māori non-Pacific

- Steadily decreasing mortality rates for all causes of death except:
  - suicide
  - female lung cancer
  - prostate cancer
- Life expectancy increases during 1980s to 1990s greatest post WW II
Key findings for Maori

- Life expectancy static over last 20 years while Pākehā gain
- Mortality gap widening in all age-groups, 45-64 years biggest gap
- Mortality rates higher for sole Māori group
- Cancer mortality rates increasing as Pākehā rates decrease
- Cardiovascular mortality - trending down, but not as fast
- Respiratory disease mortality trending down
- Unintentional Injury trending down – but gap remaining
- Youth suicide - increasing
Overview

• Problem - undercounting Māori and Pacific deaths
• Solution - New Zealand Census-Mortality Study
• Results:
  – life expectancy trends by ethnicity
  – age-specific and cause-specific mortality trends
  – key findings for European, Pacific and Māori populations
• **Possible explanations - structural, health services and epidemiological**
• Where to next?
Possible Explanations for Ethnic Mortality Trends

- Socio-economic factors
- Health Services
- "Epidemiological"

Three possible lenses through which to understand the diverging mortality trends by ethnic group.
1984 and all that ....

- 1970s and early 1980s:
  - subsidies, regulated economy, low unemployment, etc..

- 1984 to 1993:
  - deregulation of the financial sector
  - reorganising the state sector
  - ending of state support for industry

Resulting in:
  - flatter tax rates, targeted welfare, regressive consumption tax, market rentals, privatisation, user charges, widening income inequalities, etc...
  - health reform
Health Disparities

- Differential access to health determinants or exposures - differences in disease incidence
- Differential access to health care
- Differences in quality of care received

Jones, 2001
Social determinants of health

Hui Taumata 1984: ‘shock absorbers in the economy’
Social determinants of health

Gaps widened in

- Education
- Labour force status
- Income
- Housing
Mean equivalent disposable income as a percentage of overall mean - households with a Māori adult

![Bar Chart showing changes in mean equivalent disposable income as a percentage of overall mean from 1982 to 1998]
Distribution Gap

NZDep96 decile
1=least deprived 10=most deprived
Distribution of Sole Māori vs Mixed Māori by NZDep96
Life expectancies at Birth, 1995-97 for Females by Deprivation Group and Ethnic Group

- Non-Māori
- Māori

Deprivation Groups 1-7
Deprivation Groups 8-9
Deprivation Group 10

Years
Mortality vs Public Hospitalisations
Males aged 45-64 years

Mortality rate per 100,000

Hospitalisation rate per 1,000

Mäori ethnic group

Päkehä
CABG and PTCA rates per 100,000 (1990 -1999)
Females

Source: Tukuitonga & Bindman, 2002
Hospitalisation rate per 10,000 population

Publicly-funded Cardiac Interventions 1996 - 1999

Westbrooke, Baxter, Hogan, 2001
Wider Determinants

The Impacts of Racism on Health

Racial climate

Internalized

Institutionalized

Personally-mediated

Health behaviors

Access to health care

SES

Differential treatment

Stress

Health outcomes

Jones et al, 2001
Summary of Issues

• Inequalities in health are the result of the unequal distribution of the determinants of health

• A systematic difference in access to goods, services and opportunities exists for Māori New Zealanders
Differential access to care, Differential quality of care

- NZ Health System – the better off have better access

- “It is a cruel fallacy that requiring co-payments will make poor people “more responsible” about their health care utilization.” (Doress-Worters, 1996)
Epidemiological Explanations: causes of death

- Life expectancy improvements up to 1980s for Māori largely due to decreasing infectious disease, TB cohort effects, falling infant mortality
- Hard to tell whether, and how much, chronic disease mortality falling among Māori up to 1980
- Small decreases in CVD (and diabetes?) mortality, accompanied by increases in cancer mortality, major reason why little (if any) improvement in Māori and Pacific life expectancy post-1980
- Non-Māori non-Pacific had rapidly decreasing CVD mortality (and modestly decreasing cancer mortality) post-1980
You're stuffing yourself with life-shortening saturated fats, sugars, and carcinogens because you've lost your land, language and mana, right?

Gee, I just thought I was having a feed...
Epidemiological Explanations: risk factors

**Caveat:** An exclusive focus on risk factor explanations is erroneous given their social structuring. Past health education programmes may have actually exacerbated ethnic health inequalities.

- Poor time series data on risk factors (e.g. cholesterol, exercise, etc…) by ethnicity
- Tobacco consumption:

<table>
<thead>
<tr>
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<th>1981</th>
<th>1996</th>
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<tbody>
<tr>
<td>Māori</td>
<td>51.9%</td>
<td>40.5%</td>
</tr>
<tr>
<td>Pacific</td>
<td>31.6%</td>
<td>28.0%</td>
</tr>
<tr>
<td>Non-Māori non-Pacific</td>
<td>30.9%</td>
<td>21.5%</td>
</tr>
</tbody>
</table>

Smoking prevalence by ethnicity, 1981 and 1996 censuses
Smoking prevalence by ethnicity, 1981 and 1996 censuses
Trends in BMI

![BMI Trends](image)
Trends in Energy intake
Trends in %Fat intake
Where to next? I

• Reducing socio-economic gaps between ethnic groups is a priority and will reduce health gaps

• Improving both mainstream health service responsiveness to Māori and Pacific and resourcing of Māori and Pacific delivered health services is required

• Possible interventions targeting risk factors:
  – need careful design and evaluation to ensure they reduce, not exacerbate, ethnic disparities in health
  – must avoid victim blaming and deficit thinking
Where to next? II

• The results presented here challenge policy makers, providers and researchers alike

• Ongoing critical reflection, analysis and research is required of:
  – current policy and practice
  – priorities and funding arrangements
  – institutional arrangements and racism
  – explanations of ethnic disparities in health
  – possible interventions to close the gaps.

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