Why the TB incidence rate is not falling in NZ?

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Aims

   - Identify trend of TB incidence
   - Identify populations most affected

2. To assess factors contributing to TB incidence
   - Migration
   - HIV/AIDS
   - MDR-TB

3. To identify improvements to TB prevention & control
Methods

Source of data and information

- Census data (1996 & 2001) - Statistics NZ
- AIDS surveillance data - AIDS Epidemiology Group
- Other reports on TB incidence
Methods (contd.)

- Descriptive epidemiology:
  - Incidence rate by age, ethnicity, birth place (1995-99 and 2000-04)
  - Interval between migration and onset of disease

- Analysis of additional surveillance data:
  - HIV co-infection (using AIDS surveillance data)
  - Outbreak surveillance data

- Appraisal of multi-drug resistance reports
TB incidence, 1922-2004

Tuberculosis notification rate (crude rate per 100,000) in New Zealand, 1922-2004.
Incidence rate by age group
Incidence rate by ethnicity and age group

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Average annual incidence rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 9 years</td>
<td>European: 0, Maori: 0</td>
</tr>
<tr>
<td>10 to 19 years</td>
<td>European: 2, Maori: 0</td>
</tr>
<tr>
<td>20 to 29 years</td>
<td>European: 4, Maori: 0</td>
</tr>
<tr>
<td>30 to 39 years</td>
<td>European: 6, Maori: 0</td>
</tr>
<tr>
<td>40 to 49 years</td>
<td>European: 8, Maori: 0</td>
</tr>
<tr>
<td>50 to 59 years</td>
<td>European: 10, Maori: 0</td>
</tr>
<tr>
<td>60 to 69 years</td>
<td>European: 12, Maori: 0</td>
</tr>
<tr>
<td>70+ years</td>
<td>European: 14, Maori: 0</td>
</tr>
</tbody>
</table>
Incidence rate by ethnicity and age group

Pacific people

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Average annual incidence rate per 100,000 1995-1999</th>
<th>Average annual incidence rate per 100,000 2000-2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 9 years</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10 to 19 years</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>20 to 29 years</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>30 to 39 years</td>
<td>150</td>
<td>300</td>
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<tr>
<td>40 to 49 years</td>
<td>200</td>
<td>400</td>
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<tr>
<td>50 to 59 years</td>
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<td>500</td>
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<tr>
<td>60 to 69 years</td>
<td>300</td>
<td>600</td>
</tr>
<tr>
<td>70+</td>
<td>350</td>
<td>700</td>
</tr>
</tbody>
</table>

Others

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Average annual incidence rate per 100,000 1995-1999</th>
<th>Average annual incidence rate per 100,000 2000-2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 9 years</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>10 to 19 years</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>20 to 29 years</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>30 to 39 years</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>40 to 49 years</td>
<td>50</td>
<td>100</td>
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<tr>
<td>50 to 59 years</td>
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<td>120</td>
</tr>
<tr>
<td>60 to 69 years</td>
<td>70</td>
<td>140</td>
</tr>
<tr>
<td>70+</td>
<td>80</td>
<td>160</td>
</tr>
</tbody>
</table>
Trend in incident cases by place of birth

Chi-square test of trend:

- NZ born
- Overseas born

Number of cases:

- 2000
- 1500
- 1000
- 500
- 0

Years:
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004

Chi-square test of trend:
- p<0.001
- p=0.606
Incidence by region of birth

Annual incidence rate per 100,000

Africa
Asia
Pls
NZ

1995-99
2000-2004
Incidence by country of birth: Africa

Incidence by country of birth: Asia

Annual incidence rate per 100,000

1995-1999

2000-2004
Incidence by country of birth: Pacific Islands

Annual incidence rate per 100,000

- Cook Islands
- Fiji
- Niue
- Samoa
- Tokelau
- Tonga
- Tuvalu
- Other Pacific Islands
- Total Pacific Islands

1995-1999
2000-2004
Incidence by country of birth: Low TB incidence countries

![Bar chart showing annual incidence rates per 100,000 for Europe (low incidence), North America, Australia, and New Zealand for the years 1995-1999 and 2000-2004.]

- **Europe (low incidence)**: 5.0 (1995-1999), 4.0 (2000-2004)
- **Australia**: 1.0 (1995-1999), 1.0 (2000-2004)
- **New Zealand**: 4.0 (1995-1999), 4.0 (2000-2004)
Interval between migration and notification of TB

Cases born in high-incidence countries

Cases born in Low-incidence countries
TB Outbreaks

- 241 cases (including LTBI)
- Pacific people 47%, Maori 41% (in non-outbreak situations 16% and 15%)
- 6.8% of total cases were part of outbreaks
## TB in NZ- and Overseas-born by ethnicity and age group

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Age group</th>
<th>NZ-born</th>
<th>Overseas-born</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95-99</td>
<td>00-04</td>
<td>95-99</td>
</tr>
<tr>
<td>European</td>
<td>&lt;40</td>
<td>0.76</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>=&gt;40</td>
<td>3.83</td>
<td>1.95</td>
</tr>
<tr>
<td>Maori</td>
<td>&lt;40</td>
<td>7.03</td>
<td>7.69</td>
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<tr>
<td></td>
<td>=&gt;40</td>
<td>28.94</td>
<td>21.90</td>
</tr>
<tr>
<td>Pacific</td>
<td>&lt;40</td>
<td>18.59</td>
<td>23.84</td>
</tr>
<tr>
<td></td>
<td>=&gt;40</td>
<td>14.09</td>
<td>9.16</td>
</tr>
<tr>
<td>Other</td>
<td>&lt;40</td>
<td>9.73</td>
<td>8.55</td>
</tr>
<tr>
<td></td>
<td>=&gt;40</td>
<td>30.72</td>
<td>12.19</td>
</tr>
</tbody>
</table>

*Incidence rate per 100,000*
MDR-TB

- MDR-TB rare in NZ - 19 cases in 10 years
- All cases born overseas
- Only 1 case (also overseas-born) developed MDR during treatment in NZ
- No documented evidence of MDR-TB transmission within NZ
HIV/AIDS and TB

Chi-square test of trend: p=0.47
Conclusions:

- Overall TB incidence is static in NZ
- Main source of disease is migration of TB-infected people from high incidence countries
  - Risk highly variable for different countries
  - Development of disease highest within a year of migration
  - No evidence migrants spreading TB to NZ-born people
Conclusions (cont.):

- TB incidence rates in most NZ-born people are static or declining
  - E.g. NZ born European <40, rate <0.5 / 100 000
- Other contributors to global TB emergence not important in NZ (yet)
  - HIV/AIDS
  - TB drug resistance
Implications for TB control

- Stricter immigration health screening
- Organised system of screening of family reunification refugees
- Awareness of TB for clinicians who are looking after immigrants and refugees
- Increased aid and development assistance to control the disease globally and regionally
Acknowledgement

- He Kainga Oranga (Housing and Health Research Programme) at the Department of Public Health, Wellington School of Medicine and Health Sciences
- Health Research Council of NZ
- NZ Population Health Charitable Trust
- Institute of Environmental Science & Research Limited (ESR)
- Statistics NZ
- AIDS Epidemiology Group
Publications

This work has been published as two papers in NZMJ on 13 October 2006:

- Tuberculosis epidemiology in New Zealand: 1995–2004 by Dilip Das, Michael Baker, Lester Calder

- Why the tuberculosis incidence rate is not falling in New Zealand by Dilip Das, Michael Baker, Kamalesh Venugopal, Susan McAllister

www.nzma.org.nz/journal/