Renal disease among Indigenous Australians

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Standardised Mortality Rates (per 100,000)
Australia and other developed countries
Life Expectancy

• An Indigenous Australian male born in 1997-99 could expect to live 56 years

• This equates to:
  – A non-indigenous Australian male born in 1901-10
  – A male born in war-torn Sudan in 2000

• An Indigenous Australian female born in 1997-99 could expect to live 63 years

• This equates to:
  – A non-indigenous Australian female born in the 1920s
  – A female born in Iraq in 2000
Deaths from heart, stroke and vasc diseases among Indigenous Australians 2000–02


Age group (years)

Number per 100,000 population

- Indigenous Australians
- Other Australians
New patients commencing RRT 2001

<table>
<thead>
<tr>
<th>State</th>
<th>1993-5</th>
<th>95% CI</th>
<th>1996-8</th>
<th>95% CI</th>
<th>1999-2001</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Territory</td>
<td>14.8</td>
<td>[12.0, 18.1]</td>
<td>17.0</td>
<td>[14.0, 20.4]</td>
<td>18.9</td>
<td>[15.9, 22.3]</td>
</tr>
<tr>
<td>Western Australia</td>
<td>10.9</td>
<td>[8.6, 13.7]</td>
<td>13.6</td>
<td>[11.0, 16.5]</td>
<td>11.3</td>
<td>[9.25, 13.8]</td>
</tr>
<tr>
<td>South Australia</td>
<td>8.4</td>
<td>[5.3, 12.6]</td>
<td>6.6</td>
<td>[4.0, 10.4]</td>
<td>10.1</td>
<td>[7.0, 14.2]</td>
</tr>
<tr>
<td>Queensland</td>
<td>6.9</td>
<td>[5.6, 8.5]</td>
<td>6.9</td>
<td>[5.5, 8.4]</td>
<td>8.4</td>
<td>[7.1, 10.0]</td>
</tr>
<tr>
<td>NSW/ ACT</td>
<td>2.9</td>
<td>[2.0, 3.9]</td>
<td>3.9</td>
<td>[2.9, 5.1]</td>
<td>3.7</td>
<td>[2.8, 4.8]</td>
</tr>
<tr>
<td>Victoria</td>
<td>1.7</td>
<td>[0.5, 3.9]</td>
<td>2.9</td>
<td>[1.3, 5.4]</td>
<td>4.4</td>
<td>[2.5, 7.2]</td>
</tr>
<tr>
<td>Tasmania</td>
<td>0.0</td>
<td>[0.0, 2.0]</td>
<td>0.0</td>
<td>[0.0, 1.9]</td>
<td>0.5</td>
<td>[0.0, 2.5]</td>
</tr>
</tbody>
</table>
Primary renal disease explanation

Indigenous vs. Non-Indigenous ESRD patients (n = 1,374) vs. (n = 14,280)

- **Other**
- **Hypertension**
- **Uncertain**
- **GN**
- **Diabetes**

**New Australian ESRD patients 1993 - 2002**
Genetic explanation

- Initiation and progression of renal disease genetically determined
- Racial differences in physiological processes and pathological responses
- Attributed to genetic factors
Early development explanation

• Nephron development intrauterine life
• People born with fewer nephrons have less renal reserve to lose and predisposition to renal disease
  – “Low nephron hypothesis“
• Evidence – animal models, histological studies including prospective autopsy study
Renal biopsy findings
Glomerular hyperfiltration theory

- Nephron number:
  - ↓Nephron number
  - Glomerular hyperfiltration
  - ↑Glomerular size
  - Glomerular hypertension
  - Progressive scarring
  - Nephron loss
Disadvantage and ESRD incidence

(Circle size proportional to regional population)

Rank from 1 = least to 36 = most disadvantaged region

SIR = 1 for total Australian resident population

*Ethnicity & Disease* 2002; 12 (3): 373-8
Non-Indigenous ESRD Patients and Renal Service Providers

Legend:
- ▲ dialysis unit w/o transplant
- + dialysis unit with transplant
- number of patients:
  - 1
  - 2 - 3
  - 4 - 6
  - 7 - 11
  - 12 - 50

Map prepared by GISCA
Adelaide University
March 2001
Indigenous ESRD Patients and Renal Service Providers

- Dialysis unit w/o transplant
- Dialysis unit with transplant

Number of patients:
- 1
- 2 - 3
- 4 - 6
- 7 - 11
- 12 - 27

Map prepared by GISCA
Adelaide University
February 2001
Current modality at 30 September 2003

Indigenous: (n = 858)
Non-Indigenous: (n = 12,590)
Overall outcomes

Survival of all new RRT patients in Australia post 1/1/97 by indigenous origin
# Transplant access

<table>
<thead>
<tr>
<th>Patient group</th>
<th>ESRD cases</th>
<th>Transplants</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Whites</td>
<td>206,253</td>
<td>56,597</td>
<td>27.4</td>
</tr>
<tr>
<td>Native Americans</td>
<td>6,589</td>
<td>969</td>
<td>14.7</td>
</tr>
<tr>
<td>Canadian Whites</td>
<td>10,560</td>
<td>3,570</td>
<td>33.8</td>
</tr>
<tr>
<td>Aborigines</td>
<td>1,856</td>
<td>153</td>
<td>8.2</td>
</tr>
<tr>
<td>Aust. Whites</td>
<td>6,619</td>
<td>2,554</td>
<td>38.6</td>
</tr>
<tr>
<td>Aborigines</td>
<td>945</td>
<td>106</td>
<td>11.2</td>
</tr>
<tr>
<td>NZ Whites</td>
<td>943</td>
<td>445</td>
<td>47.2</td>
</tr>
<tr>
<td>Maoris</td>
<td>760</td>
<td>86</td>
<td>11.3</td>
</tr>
</tbody>
</table>
Transplant rates
(Transplants per hundred patient years)
## Time to transplantation

<table>
<thead>
<tr>
<th>Patient group</th>
<th>Median time to Transplant (years)</th>
<th>Inter-quartile range</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Whites</td>
<td>0.90</td>
<td>0.18-1.89</td>
</tr>
<tr>
<td>Native Americans</td>
<td>1.56</td>
<td>0.61-2.70</td>
</tr>
<tr>
<td>Canadian Whites</td>
<td>1.36</td>
<td>0.63-2.32</td>
</tr>
<tr>
<td>Aborigines</td>
<td>1.74</td>
<td>1.01-2.57</td>
</tr>
<tr>
<td>Aust. Whites</td>
<td>1.26</td>
<td>0.58-2.46</td>
</tr>
<tr>
<td>Aborigines</td>
<td>1.85</td>
<td>1.15-2.94</td>
</tr>
<tr>
<td>NZ Whites</td>
<td>1.18</td>
<td>0.44-2.13</td>
</tr>
<tr>
<td>Maoris</td>
<td>2.12</td>
<td>0.92-3.26</td>
</tr>
</tbody>
</table>
Transplant rates throughout 1990s
(Indigenous: White transplant rate ratios)

Incident patient cohorts
Regional variation in transplant access

(Indigenous: White transplant rate ratios)

Indigenous proportion of regional ESRD patients (%)