Serious disease and injury in remote Queensland: 12 years of aero-medical retrievals by the Royal Flying Doctor Service
For more than 75 years, the Royal Flying Doctor Service (RFDS) has been the pre-eminent provider of aero-medical retrieval services to remote Indigenous communities across Queensland.
Tyranny Of Distance

Metro-centric population and resources
RFDS clinical services

Primary Health Care
Telephone consultations
Medical chests
Health Promotion
Baby clinics
Women’s health
Mental health
Aeromedical retrieval
Aeromedical /Emergency Services

- 24/7 service
- Nurse on all flights
- Doctor on board as required
- Fully pressurised and high speed aircraft
- ICU equipped
### Australia wide statistics

<table>
<thead>
<tr>
<th>For the year ended 30 June 2005</th>
<th>Daily Average</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service Area km²</strong></td>
<td>7,150,000</td>
<td></td>
</tr>
<tr>
<td><strong>Patients Attended</strong></td>
<td>643</td>
<td>234,483</td>
</tr>
<tr>
<td><strong>Aerial Evacuations</strong></td>
<td>91</td>
<td>33,339 (1)</td>
</tr>
<tr>
<td><strong>Healthcare Clinics</strong></td>
<td>31</td>
<td>11,239</td>
</tr>
<tr>
<td><strong>Distance Flown (kms)</strong></td>
<td>53,491</td>
<td>19,524,359</td>
</tr>
<tr>
<td><strong>Number of Landings</strong></td>
<td>159</td>
<td>57,857</td>
</tr>
<tr>
<td><strong>Telehealth</strong></td>
<td>202</td>
<td>73,694</td>
</tr>
<tr>
<td><strong>Number of Aircraft</strong></td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td><strong>Bases</strong></td>
<td>-</td>
<td>22</td>
</tr>
<tr>
<td><strong>Staff</strong></td>
<td>-</td>
<td>640 (2)</td>
</tr>
</tbody>
</table>

(1) Includes hospital to hospital transfers  
(2) Includes 145 part time staff
Aim of study

A Comparative Analysis of 12 years of Aero-Medical Retrievals of Indigenous People Living in Indigenous Communities in Remote Queensland by the Royal Flying Doctor Service
Database

- RFDS Queensland Section retrieval database
- Time frame: 01/03/1994 - 01/03/2006
Inclusion Criteria (1)

- Located in remote Queensland with a Rural Remote Metropolitan Area Code (RRMA) of 7
- Regularly utilised RFDS(Qld) for retrievals
- As data is centred around airstrips, the geography of the location and proximity to a specified airstrip utilised by the RFDS meant that retrieval data for that airstrip could be readily attributed to that location
Inclusion Criteria (2)

• Sufficiently remote that few if any people would be retrieved by any other means eg road or helicopter and hence on another database

• Australian Bureau of Statistics population census 2001 data available
Inclusion Criteria (3)

- The population of the study locations were predominantly Indigenous.
- The population of the control locations were predominantly non-Indigenous.
- The range of population numbers in study and control locations were of similar size.
Human Research Ethics Committee Approval

- James Cook University
- University of Queensland
Study Locations: population

- 7 remote Indigenous communities
  - 4469 Indigenous people
    - 85% of total population
    - 51% female

- 16 remote non-Indigenous communities
  - 9242 non-Indigenous people
    - 88% of total population
    - 48% female
Study Locations: health facilities

- 7 remote Indigenous communities
  - 5 with primary health care clinics
  - 2 with hospitals with 1 - 14 beds
- 16 remote non-Indigenous communities
  - 7 with primary health care clinics
  - 5 with hospitals with 1 - 14 beds
  - 4 with hospitals with 15 – 29 beds
- None with operative or obstetric services
Retrievals

- Indigenous People from study locations
  - 5453 for 4469 people
- Non-Indigenous people from control locations
  - 4222 for 9242 people
- $P < 0.0001$
Retrieval rate

• Indigenous People from study locations
  – 101.68 retrievals/1000 people/year
• Non-Indigenous people from control locations
  – 38.07 retrievals/1000 people/year
Purpose of Retrieval

- 99.5% were transferred to a health care facility with a higher level of expertise
- 60% to a hospital with at least 200 beds
- 67% to a hospital with at least 100 beds
- 96% to a hospital with at least 50 beds
Age of retrieved patient

- Indigenous People from study locations
  - 30.3 +/- 20.9 years
- Non-Indigenous people from control locations
  - 43.7 +/- 24.1 years
- p<0.0001
Sex of retrieved patient

- Indigenous People from study locations
  - 55% female
- Non-Indigenous people from control locations
  - 41% female
- \( p < 0.0001 \)
Weekend Retrievals

- Indigenous People from study locations
  - Friday/Saturday/Sunday 44%
- Non-Indigenous people from control locations
  - Friday/Saturday/Sunday 40%
- \( p < 0.0001 \)
Clinical Severity of Retrieved People

• Indigenous People from study locations
  • 59% Critical or High severity
• Non-Indigenous people from control locations
  • 41% Critical or High severity
• P=0.001
Clinical Diagnostic Categories

• Each retrieval
  – Up to 3 diagnostic categories
  – Up to 1 cause of injury

• Based on ICD-10 3rd edition
Clinical Diagnostic Categories

In decreasing order of frequency
By rate/1000 people/year

Indigenous
Injury
Respiratory
Circulatory

Non-Indigenous
Injury
Respiratory
Circulatory
Retrievals for injury

• Indigenous People from study locations
  – 27.78 retrievals/1000 people/year
    • 30% critical or high severity

• Non-Indigenous people from control locations
  – 14.12 retrievals/1000 people/year
    • 27% critical or high severity

• Regarding severity: P>0.5
Retrievals for Disorders of Respiration

- **Indigenous People from study locations**
  - 21.67 retrievals/1000 people/year
    - 48% critical or high severity
- **Non-Indigenous people from control locations**
  - 7.53 retrievals/1000 people/year
    - 44% critical or high severity
- Regarding severity: P=0.03
Retrievals for Disorders of Circulation

- Indigenous People from study locations
  - 11.75 retrievals/1000 people/year
    - 55% critical or high severity
- Non-Indigenous people from control locations
  - 6.76 retrievals/1000 people/year
    - 42% critical or high severity
  
- Regarding severity: P<0.0001
Retrievals for pregnancy

• Indigenous People from study locations
  – 10.11 retrievals/1000 people/year
    • 32% critical or high severity

• Non-Indigenous people from control locations
  – 1.90 retrievals/1000 people/year
    • 31% critical or high severity

• Regarding severity: P > 0.5
Retrievals for Mental Health

- Indigenous People from study locations
  - 5.37 retrievals/1000 people/year
    - 51% critical or high severity
- Non-Indigenous people from control locations
  - 0.95 retrievals/1000 people/year
    - 59% critical or high severity

- Regarding severity: P>0.5
Summary

• Indigenous People living in Indigenous Communities
  – Higher rate of retrieval
  – Younger age
  – Higher proportion female
  – More likely to be retrieved on the weekend
  – Higher clinical severity
Summary

- Indigenous People living in Indigenous Communities
  - Most common diagnoses [by rate]:
    - Injury: approx 2x [of equal severity]
    - Respiratory: approx 3x [of higher severity]
    - Circulation: approx 2x [of higher severity]
  - Other diagnoses
    - Pregnancy: approx 5x [of equal severity]
    - Mental Health: approx 5x [of equal severity]
CONCLUSION

This study quantifies and details both the size and nature of the disparity in serious illness / injury that requires aero-medical retrieval experienced by Indigenous people in remote Queensland when compared with their non-Indigenous counterparts.