Aboriginal Health and Ageing
A lifecycle approach

The Koori Growing Old Well Study - KGOWS

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Aboriginal Artist LeAnne Hunter
Aboriginal Health & Ageing
Outline of Talk

• Background to Aboriginal Health & Ageing

• Setting up urban Aboriginal Community Services & Research

• *First World* (non-Indigenous) Health Transition and Ageing

• *Fourth World* Aboriginal Health Transition and Ageing

• Koori Growing Old Well Study – Questions addressed:
  – What are the important determinants of Aboriginal ageing, dementia and the gap in lifespan?
  – How may childhood experiences determine Aboriginal health/ageing
From 1788 thru the 1800s – “new” infectious diseases (measles, flu, small pox, infectious diarrhoeas, tuberculosis etc) decimated Aboriginal populations as ‘first contact’ with Europeans rolled out across Australia

Aboriginal depopulation was made worse: by the legal fiction of “terra nullius” leading to dispossession from land, culture and subsequently children; by changes in diet, housing & lifestyle; by violence, neglect & discrimination; and by policies of ‘assimilation’ & ‘protection’ with lack of access to basic human rights through the 1800s and up to the 1960s

Leading to the belief that Aboriginal people - in the 1950s - were a “dying race”
• However - from the 1960s infant mortality has been steadily falling – but still 3 x non-Indigenous
• From the 1990s through 2000s Aboriginal life-span has been increasing & fertility is starting to fall
• There are growing numbers of old-old ‘survivors’ - 75 years and over (mortality x 1.3) in all Aboriginal groups from the Remote Kimberleys to Urban La Perouse
• The Australian Aboriginal population is both
  – Growing rapidly with a large young population (0-24 years)
  – Ageing rapidly – led by the young old (45-64 years)

2. **Improved health care & services?** – Certainly in NT & Australia wide - from the ’90s (N.T. - Thomas et al 2006; AIHW)

3. **Opportunities for child brain development & education?** Lagging well behind other advances
Aboriginal Health and Ageing Today

• Health and lifespan in Urban/Regional Aboriginal communities (around 70% of popn.) is no better than in more Remote Aboriginal people (around 30%) - despite major lifestyle differences (ABS/AIHW/WAACHS data)

• Aboriginal people today are facing
  – Health and lifespan similar to non-Indigenous Australians 70 years ago (Demographic Transition data)
  – A delayed & mixed Epidemiologic & Demographic Transition
  – A lifecycle of unresolved risk factors -commencing in infancy
Aboriginal Health & Ageing

Outline

• Setting up Aboriginal Community Services and the Koori Growing Old Well Study (KGOWS)

“No research without services” – Fred Hollows
KGOWS: How did we get started?

• Working in La Perouse with Aboriginal Health Workers (AHWs) from 2000 we could clearly see
  
  – Poor health and high mid-life death rates - similar to remote
  – Lack of services, staff and service model - similar to remote
  – Lack of information on Aboriginal population health – unlike remote
  – Why was Urban Aboriginal health - as poor as remote?

• We reasoned – If Australia can’t get health right for urban Aboriginal people - in Sydney’s richest ‘Eastern Suburbs’ - how can we close the gap for remote & rural Aboriginal people?
2000+ urban Aboriginal people live around La Perouse – banished there in early 19th C. beside Long Bay Jail and Prince Henry “Fever” Hospital

They form a near invisible community - that lost access to health care & jobs with transfer of Prince Henry to the Prince of Wales site - around 1997

POW was seen as distant, hard to access, and less interested in Aboriginal Health
In 2000 we found that the La Perouse Aboriginal community had minimal access to health services

- Hospital data showed few local Aboriginal people accessed mainstream health services
- Aboriginal Medical Service (AMS) Redfern was a long trek away & provided only a weekly GP clinic at La Perouse
- Although Prince Henry Hospital had been an early leader in Aboriginal health (Diabetes education, ENT) - Community Health now had only six Aboriginal Health Workers, with multiple service gaps
- Arrunga Health Clinic at La Perouse was closed as ‘unsafe’
What did we want to achieve?

• *To provide* La Perouse Aboriginal people with a sustainable *local model* of health care, prevention and community services - in collaboration with AHWs, AMS & other services

• **Aims – 2001 to 2010**
  – Community consultations on areas of need
  – Get ongoing Funding for aged/chronic care
  – Open Arrunga & build a modern La Perouse Health Centre
  – Grow local services to cover *the whole life span*
  – With a Track Record in Service development – plan a study to underpin policies for healthy Aboriginal Ageing
Initial outcomes - 2001 to 2005

- An *Aboriginal Community Health-Link Committee* to monitor health services

- New adult health services – in chronic disease, vascular health, geriatrics, dementia

- It became clear that - to improve adult health - we had to address *Social Determinants of Child Health* - as well as providing adult/aged health services
Outcomes for La Perouse - 2006 to 2010

• 2006: A new Aboriginal Community Health Centre (ACHC) was built - driven the Director of Aboriginal Health
• 2006–2010: An across life-span, multi-disciplinary, multi-modal Service - driven by Geriatrics & Paediatrics
• The ACHC now runs 40 clinics and services each month:
  – AMS Redfern – GP Clinics daily
  – Community Health; Home visits; Audiology; Speech Therapy
  – Health Promotion, Health Education; Vascular Health
  – Child, Adolescent & Adult Mental Health;
  – Mothers & Babies; Child Health; Immunisation; Paediatrics; Cardiology; Diabetes; ENT; D & A; Men’s Health; Chronic & Complex Care; Geriatrics; Home Visiting, Home Care
• 2008 – We started the Koori Growing Old Well Study
The Koori Growing Old Well Study: Urban-Rural Aboriginal People – the 70%

A Life Cycle Approach to Urban Aboriginal Health & Ageing
KICA-Kimberley Indigenous Cognitive Assessment Study

• KICA is a groundbreaking study of Aboriginal ageing and dementia in remote communities led by Leon Flicker, Dina LoGiudice, Kate Smith and the UWA KICA Study Team

• 6 Aboriginal Communities (90% Aboriginal people) and town of Derby (30% Aboriginal people) – A remote population with low literacy rates, low rates of education and high numbers speaking English as a second (third or fourth) language

• KICA was followed by successful validation studies in NT and NQ - establishing the “KICA Cog” as a culturally sensitive instrument to screen dementia in remote Aboriginal people
Kimberley Indigenous Cognitive Assessment Study

- 363 Kimberley Indigenous Australians ≥ 45 years (oldest: 96 years)
- Prevalence of dementia: **12.4%** (n = 45)
  5 times overall Australian rate of 2.4%
  At 65 yrs and over - 27% Vs 5.2% non-Indigenous

Dementia types *(DSM-IV)*

- Alzheimer: 11 (24%)
- Vascular: 6 (13%)
- Alcohol: 2 (4%)
- Other medical conditions: 2 (4%)
- Not otherwise specified: 24 (53%)

Koori Growing Old Well Study (KGOWS)

• Steps to KGOW Study:
  – A service record with Aboriginal Communities
  – 2008 Aboriginal Health and Ageing Workshop
  – 2009 Aboriginal Ageing Literature Review published

• 2008 NHMRC Project Grant (2008-2011): $1.5M.
  – “What is the burden of dementia in urban dwelling Indigenous Australians?”
  – Designed to address key questions about Aboriginal health, ageing and dementia in total sample of 400 adults aged 60+
Study of Aboriginal Health and Ageing
Urban-Rural Aboriginal People (70%)

- Koori Growing Old Well Study (KGOWS) - completed by 2012 in 5 Aboriginal Communities: **Urban Sydney**: La Perouse and Campbelltown (Tharawal); **Rural NSW**: Kempsey (Durri), Nambucca (Daarimba Maara), Coffs Harbour (Galimbala)

- In contrast to remote - an English speaking population with high (primary) schooling rates, basic literacy and numeracy

- Partnerships with each local community AMS, Elders Group and/or Land Council
• Preliminary KICA findings on potential Risk Factors - (Associations) with Dementia in Aboriginal people
## Dementia ‘Risk Factors’ in Remote Popn.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>KICA Study</th>
<th>Multivariate O.R. [CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>45 – 96 (54% &lt;60yrs)</td>
<td></td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>45% (165/363)</td>
<td>3.1 [1.4 – 6.8]</td>
</tr>
<tr>
<td><strong>No formal education</strong></td>
<td>40%</td>
<td>2.7 [1.1 – 6.7]</td>
</tr>
<tr>
<td><strong>Previous stroke</strong></td>
<td>9%</td>
<td>17.9 [5.9 – 49.7]</td>
</tr>
<tr>
<td><strong>Head Injury</strong></td>
<td>51%</td>
<td>4.0 [1.7 – 9.4]</td>
</tr>
<tr>
<td><strong>Epilepsy</strong></td>
<td>3%</td>
<td>33.5 [4.8 – 232.3]</td>
</tr>
<tr>
<td><strong>Current smoker</strong></td>
<td>35%</td>
<td>4.5 [1.1 – 18.6]</td>
</tr>
<tr>
<td><strong>Currently drinks alcohol</strong></td>
<td>37%</td>
<td>1.8 [0.5 – 6.5]</td>
</tr>
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</table>

(Smith K et al 2011)
Comparison of ‘Risk Factors’: Urban Pilot Sample

<table>
<thead>
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<th>KICA Study (Smith et al.)</th>
<th>KGOWS (Broe Group)</th>
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<tr>
<td><strong>Age</strong></td>
<td>45 – 96 (54% &lt;60yrs)</td>
<td>41 – 81 (36% &lt;60yrs)</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>45% (165/363)</td>
<td>30% (13/44)</td>
</tr>
<tr>
<td><strong>No formal education</strong></td>
<td>40%</td>
<td>0% (0/39)</td>
</tr>
<tr>
<td><strong>Previous stroke</strong></td>
<td>9%</td>
<td>15% (5/33)</td>
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<td>21% (7/34)</td>
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<td>3%</td>
<td>3% (1/34)</td>
</tr>
<tr>
<td><strong>Current smoker</strong></td>
<td>35%</td>
<td>34% (10/29)</td>
</tr>
<tr>
<td><strong>Currently drinks alcohol</strong></td>
<td>37%</td>
<td>64% (10/29)</td>
</tr>
</tbody>
</table>
Epidemiologic (Health) Transitions
Causes of morbidity and death

• *First World* (non-Indigenous) Health Transitions and Life Expectancy
First World (non-Indigenous) Life Expectancy 1881-2006

Australian Population

Non-Indigenous life expectancy 81.1 years

Current Indigenous life expectancy 62.1 years

95+ yrs by 2050

Aboriginal life expectancy today equals non-Indigenous ~ 1940
4 Stage Epidemiologic Transition Theory

The causes of Morbidity & Death in the ‘West’

1. A world of pandemic infections & early death prior to the 18\textsuperscript{th} C. – av. survival 30 yrs
2. Receding infections in 19\textsuperscript{th} C. and rising systemic diseases - heart, stroke, lung & av. survival 50 yrs
3. A Final? Stage of Systemic ‘non-communicable’ Diseases with average survival maximum of 70 yrs
4. Then in 1986, Olshansky defined a 4\textsuperscript{th} Stage of “Delayed Systemic Diseases” with average survival predicted to be a maximum of 85 yrs?

Omran 1971

Olshansky 1986
First World Epidemiologic Transition and Life Expectancy 1881-2006

Australian Population

- Infectious Diseases Fall
- Heart & Lung Diseases Rise
- Heart & Lung Diseases Delayed
- Dementias Rise

Non-Indigenous life expectancy 81.1 years

Current Indigenous life expectancy 62.1 years

Years of age


95 yrs by 2050
First World Epidemiologic Transitions

Immediate causes of death – What killed people

<table>
<thead>
<tr>
<th>18th-19th century</th>
<th>20th century</th>
<th>21st century</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infectious Diseases</strong>&lt;br&gt;Typhoid, Cholera&lt;br&gt;Diarrhoeas&lt;br&gt;Small Pox &amp; TB</td>
<td><strong>Systemic Diseases</strong>&lt;br&gt;Heart, Vascular,&lt;br&gt;Stroke, Diabetes&lt;br&gt;Lung diseases</td>
<td><strong>Brain Diseases</strong>&lt;br&gt;Dementias; PD&lt;br&gt;Cognitive disorders&lt;br&gt;Gait disorders</td>
</tr>
<tr>
<td>Mortality - high in&lt;br&gt;Infants/Children&lt;br&gt;Fertility - high</td>
<td><strong>Mortality</strong> – high in&lt;br&gt;mid-life - then delay&lt;br&gt;Fertility – falling</td>
<td><strong>Mortality</strong> delayed to Old Age&lt;br&gt;Fertility - low</td>
</tr>
</tbody>
</table>

# First World Epidemiologic Transitions

**The social determinants of health and longevity**

<table>
<thead>
<tr>
<th>18 - 19(^{th}) century (from Indust Revn.)</th>
<th>20(^{th}) century (From 1950s)</th>
<th>21(^{st}) century (By 2050 - we hope)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Infectious Diseases</td>
<td>Delay Systemic Diseases</td>
<td>Delay Dementias?</td>
</tr>
<tr>
<td>*Education &amp; Jobs</td>
<td>*Education &amp; jobs</td>
<td>*Better parenting</td>
</tr>
<tr>
<td>Industrial Wealth</td>
<td>Rising Incomes</td>
<td>*Early/higher education</td>
</tr>
<tr>
<td>More calories</td>
<td>Ice Chest/Fridge</td>
<td>*Brain development</td>
</tr>
<tr>
<td>Falling fertility</td>
<td>Less salt/healthier food</td>
<td>*Lifelong learning</td>
</tr>
<tr>
<td>Less crowding</td>
<td>Less cigarettes/alcohol</td>
<td>*IT, Wii, InfoNet, etc</td>
</tr>
<tr>
<td>Hygiene &amp; Public Health</td>
<td>Medical interventions</td>
<td>Medical interventions</td>
</tr>
</tbody>
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First World Epidemiologic Transitions

Social determinants of health and longevity?

- Rising Educat’n 18th C. - Compulsory Educat’n 19th C.
- More Jobs and Wealth - 19th C. Industrial Revolution
- Fertility Mothers chose fewer kids - to be better educated - from 19th C. on - (Lucas R. E. Lectures on Economic Growth 2002)
- Enough Calories in 19th C. - Healthier food in 20th C.
  Too much food 21st C. (Fogel R.W. Escape from Hunger.....2004)
- Chadwick -Sanitation & ‘Old’ Public Health –1850s on
- ‘New’ public health & medical advances - 1930s on

Many factors have by-passed Aboriginal Australians
Brain and Mind Growth is the Key Factor - in creating wealth - in delaying diseases - in extending lifespan
(Economists - Robert Lucas 2002; James Heckman 2006)

Brain and mind growth - or ‘Human Capital Formation’ (economists’ definition) - require
– Good parenting & lower childhood trauma rates
– Better child education & ongoing adult education
– Better, brainier jobs

This Key Factor has by-passed many Aboriginal Australians
Outline

• Demographic and Epidemiologic Transitions in *Fourth World* Aboriginal Australia

The same Health Transitions - *and associated Population Transitions* - are occurring - however they are both delayed and mixed
Projected Total fertility rate = 1.75, annual net migration = 110,000.

Census of the Commonwealth of Australia, Population by age and sex, Australian States and Territories (3201 0)
Australian Aboriginal Population by Age
Similar to non-Indigenous around 1940

Young-old Rising

Older-old 75+

Young People – 0 to 24 yrs
= A Potential Aboriginal Demographic Dividend -
Given a better early life, education & jobs

Indigenous Australian Population

ABS 2004a IN Population and Diversity: Policy Implications of Emerging Indigenous Demographic Trends
Mixed & delayed epidemiologic transition in Fourth World Aboriginal Australians

The three transition stages are concurrent:

1. **Infectious Diseases** have declined but some remain- (child skin & nasal strep with chronic renal, cardiac ENT sequelae)

2. **Mid-life systemic diseases (heart, lung & vascular)** are starting to decline, fertility to fall & lifespan to rise (Thomas et al – 2006; Condon et al 2006)

3. **However - Dementia rates at 60+** - are 5 times non-Indigenous (KICA Study 2008; KGOWS pre-pilots; N.Q.)
Aboriginal life span is improving
But the Gap stays the same?
Questions our Study hope to address

– What is the rate of dementia in Urban Aboriginal people?

– What are the determinants of Aboriginal health, ageing, dementia and the gap in lifespan?

– How may childhood experiences determine Aboriginal health/ageing?
Are Childhood Experiences the important link-

• To mid-life health?

• To ageing well?

• To reducing premature cognitive decline & dementia?

• Therefore - To closing the gap?
Q: When does the Mind-Brain Grow?
All our lives but MOSTLY IN CHILDHOOD

Q: How does the Mind-Brain Grow?
Mothers, family, environment, genes – grow it

MRI Brain Scan
Normal Neonate

A thin strip of Cortex

MRI Brain Scan
Normal Adult

Masses of ‘gyri’ = Complex Cortex
How can childhood experiences predict Adult Health and Ageing?

• Mothers, parents, education, peers – working with genes - **grow** children’s minds & brains

• Adverse Childhood Events - *stress, trauma, absent parenting etc* – **impact neurodevelopment** causing defects in neural structure & function i.e., *Attention, Social, Emotional, Learning deficits & PTSD*

• **Childhood neural defects** - plus **social and educational disadvantage** - determine poor adult health outcomes? And accelerate dementia onset in older Aboriginal survivors?
Q: What is the evidence that early life experiences predict adult outcomes? A fair bit

• 1996 - *Linguistic ability in early life* and later onset of Alzheimer’s disease – *The Nun Study* (Snowden... JAMA)

• 1997 - *The advantage of being broad minded* - later onset of dementia - *Sydney Older Veterans Study* (Jorm... Personality & Individ Diffs)

• 2000 - *Mental ability at 11 yrs* & health and dementia at 70+ yrs – *Scottish School Children Study* (Starr... Age & Ageing; Whalley.. Neurology)

• 2002 - *Adverse Childhood Experiences & Adult Health Risks* – *Kaiser Permanente Study* (Felliti.. Permanente J; Anda... Psychiat Services)
Q: What is the evidence that early experiences predict adult outcomes? Continued....

• 2002 *Brain structures* in child maltreatment-related posttraumatic stress disorder (*De Bellis...Biological Psychiatry*)

• 2008 - *Brain development*, socio-economic disadvantage & sentencing – *A review* (*Bennett & Broe....Criminal Law Journal*)

• 2009 - *Adverse Childhood Experiences* - adult depression & metabolic risk – *A 34 Year Prospective Study* (*Danese...Arch Pediat Adolesc Med*)

• 2010 - *Mother’s affection at 8 months* predicts emotional distress in adulthood – *A 32 Year Prospective Study* (*Maselko...Journal. Epi Comm Health*)
We examine the following early life risk factors:

- Racial discrimination
- Separation/out of home care
- Lack of parenting or p. skills
- Adverse Childhood Events
  - Violence towards women/mothers
  - Childhood emotional trauma, violence & abuse
  - Childhood exposure to Alcohol/Drug abuse and to Mental Illness
  - Childhood/youth entry to Criminal Justice system (x 12 non-Indigen)
What factors lead to normal development, good brain growth and good adult outcomes?

We examine the following early life risk factors:

- Supportive, secure family
- Parenting skills
- Informal learning
- Early childhood education
- Access to schools/education
Q: What are current indices of Early Life Stress (ELS) for Aboriginal people? Urban & Remote

- Low birth weight – 2 times non-Indigenous
- Out-of-home-care – 6 times non-Indigenous
- Criminal Justice Sentence - 21 times non-Indigenous
- Family violence
  - To children – 3 times non-Indigenous
  - To women – 6 times non-Indigenous
- Year 9 or less education - 5 times non-Indigenous
- HSC awarded – 1/2 non-Indigenous
- Bachelor plus Degree - 1/4 non-Indigenous
Q: What are KGOWS measures of Early Life Stress (ELS) in urban Aboriginal population?

- **Childhood trauma questionnaire (CTQ)** – 32 indices of good & bad parenting, abuse, etc., with strong psychometric properties (Bernstein et al., 2003; Scher et al., 2001)
- **Measures of Separation / Stolen Generations** (ABS/AIHW)
- **Measure of Indigenous Racism Experiences (MIRE)** (Paradies & Cunningham, 2008)
- **Education** (ABS/AIHW)
- **Informal Education** – developed with local community feedback (Hill et al., unpublished)
- **Connor-Davidson Resilience Scale (CD-RISC)** (Connor & Davidson, 2003)
What Mid-life Factors follow Early Life Stress

*We measure the following mid-life risk factors:*

- Obesity - Blood Pressure – Cholesterol – Diabetes
- Smoking - Alcohol - Drugs
- Cardio-Vascular diseases
- Social isolation
- Mental illness

**Known** causes of early disability in Aboriginal people

**Known** risk factors for dementia in multiple studies
Q: Can ELS have a direct affect on cognitive function & decline in later life?

There are a number of theories how early neural defects lead directly to later cognitive decline:

- **Stress/cortisol** cause hippocampal cell loss
- **Reduced Neuronal Reserve**
- **Selective Neuronal Vulnerability** – Early life stress causes selective deficits in pre-frontal, limbic and hippocampal networks - and these accentuate age-related neurodegeneration?
Aboriginal Artist LeAnne Hunter

**Back End**
[INPUTS from Parents, the Universe & Everything]

**Hippocampal Network**
[New memories & experiences]

**Pre-Frontal Network**
[Attention, Cognitive & Emotional Control, Drive & Action]

**Limbic Network**
[Emotional & Social learning]

**Risk Factors**
- Parenting skills
- Separation
- Child trauma
- Racial Discrim.
- Socialisation
- Education

If we grow & protect these networks in early-life, that should delay dementia at older ages.
Addressing adult medical risk factors (smoking, alcohol, obesity) and diseases (heart, lung, renal, diabetes) is essential

Addressing adult socio-economic risk factors (housing, training, jobs, discrimination) is essential

We also need to address brain growth in Aboriginal children
- Reduce the early risk factors (separation, parenting, childhood stress....)
- Stop the use of the Criminal Justice System to segregate Aboriginal kids
- Intensively treat kids with existing structural/functional brain deficits
- Provide up-market Aboriginal early education, schooling and job entry
• **KGOWS Funders:** NHMRC, Ageing Well Network, Primary Dementia Collaborative Research Centre, Alzheimers Aust., AAG, DoHA Dementia Grants, RW&JG

• **KGOWS CIs:** Bob Cumming, Lisa Jackson Pulver, Simon Chalkley, Dave Grayson, Brian Draper; **KGOWS AIs:** Gail Daylight, Vicki Wade, Tim Agius, Leon Flicker, Jeff Rowlands, Martin Prince

• **KGOWS Study Team:** Study Manager Holly Mack; Project Officers – Wendy Hampshire, Kylie Radford, Cecilia Minogue, Jennifer Japhet, Natalie Johnson; Aboriginal Researchers - Michelle Stewart, Bridget Jarrett, Garth Fatnowna, Heidi Sainsbury,

• **KGOWS NSW Aboriginal Community Partners:**
  - Aboriginal AIs Gail Daylight, Vicki Wade, Tim Agius, Colleen Cawood, Darryl Wright
  - **Metropolitan** - La Perouse Aboriginal Land Council, Tharawal ACMS, Western Sydney AMS - and AHMRC
  - **Rural** - Durri ACMS Kempsey, Darrimmba Maarra AHC Nambucca, Galambila AMS Coffs Harbour