Adopting a causal pathways approach to improving the health and educational outcomes of Indigenous children

Professor Sven Silburn¹,²

1. Menzies School of Health Research, Darwin
2. Telethon Institute for Child Health Research, Perth
“Closing the Gap” targets

0–4 years
Halve the gap in mortality rates for Indigenous children under five within a decade

4–6 years
Ensure access to early childhood education for all Indigenous four year olds in remote communities within five years

4–16 years
Halve the gap in reading, writing and numeracy achievements for children within a decade

15–64 years
Halve the gap in employment outcomes within a decade

17–24 years
Halve the gap for Indigenous students in Year 12 attainment or equivalent by 2020

Overarching target
Close the gap in life expectancy within a generation

Menzies School of Health Research
NT Birth outcomes: 1986-2005

Percentage of Indigenous births

- Premature
- BW <2,500g
- APGAR <7

Percentage of non-Indigenous births

- Premature
- BW <2,500g
- APGAR <7

Source: Zhang et al, 2010
Child growth and nutrition

Children aged < 5 yrs STUNTED

Children aged < 5 yrs UNDERWEIGHT

Children aged < 5 years WASTING

Children aged < 5 years ANAEMIC
Substantiations of child maltreatment notifications by age, state & territory

Source: AIHW, 2008–09, Child Welfare Series Number 47
69% of NT Indigenous children score below national minimum standard.
Australian Early Development Index (AEDI): NT, 2009
% of children developmentally vulnerable on 2 or more AEDI domains

<table>
<thead>
<tr>
<th>ABS remoteness category</th>
<th>Aboriginal</th>
<th>Non-Aboriginal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer regional centre (e.g. Darwin)</td>
<td>25.1</td>
<td>9.8</td>
</tr>
<tr>
<td>Remote (e.g. Alice Springs, Katherine)</td>
<td>41.0</td>
<td>8.8</td>
</tr>
<tr>
<td>Very remote (e.g. Nhulunbuy)</td>
<td>53.9</td>
<td>10.1</td>
</tr>
</tbody>
</table>
Why invest in early child development

1. **New methods in brain science and epigenetics** show how children’s experiences in their family, community and early learning environments influence brain development and establishes the foundation for their future health, learning and behaviour.

2. **Longitudinal studies** showing the extent to which adult health, wellbeing and capability have their origins in family and community environments of early child rearing.

3. **Intervention studies** demonstrating the effectiveness and long-term (adult) benefits of evidence-based preventive strategies and programs for young children.

4. **Economic studies of early childhood interventions** document the high return on investment of preventive strategies and programs delivered early in the life-course.

Leading causes of Indigenous deaths

Source: AIHW National Mortality Database (Data for Qld, WA, SA and NT 2002-06)
Early Childhood adversity and risks for adult morbidity

Risk (Odds Ratio) of specific causes of death by number of childhood adverse experience categories

Number of adverse childhood exposures in 3 categories:

Abuse: a) Physical, b) sexual, c) psychological. Household dysfunction: d) Member of child’s household with problem drinking/alcoholism, e) used street drugs, f) had a mental illness, g) attempted suicide; h) Mother treated violently; Criminality: i) Household member was imprisoned
Proposes an eco-biodevelopmental framework for understanding the evolution of human health and capability over the lifecourse.
Biological embedding of early experiences

Foundations of Healthy Development and Sources of Early Adversity

Environment of Relationships
Physical, Chemical, and Built Environments
Nutrition

Gene-Environment Interaction

Physiological Adaptations and Disruptions

Health-Related Behaviors
Educational Achievement and Economic Productivity
Physical and Mental Health

Cumulative Effects Over Time

Biological Embedding During Sensitive Periods

Source: Shonkoff, 2010
Brain development before birth

- Neurulation
- Neuronal proliferation
- Neuronal differentiation
- Neuronal migration
- Synapse formation
- Programmed cell death
- Synaptic pruning
- Myelination

Gestation (weeks):
- 4 weeks
- 8 weeks
- 12 weeks
- 16 weeks
- 20 weeks
- 24 weeks
- 28 weeks
- 32 weeks
- Birth
- Infancy
Key influences on foetal development

- **Smoking** – Infant survival, SIDS, infant & child respiratory health, infant & longer term sleeping patterns, cognitive development and behaviour
- **Alcohol** – FAS & FASD (no safe threshold)
- **Maternal stress** – risk of child behavioural and emotional problems especially ADHD, impulsivity and emotional over-reaction, language delay
- **Antenatal & perinatal depression** - increased risk of child behavioural and emotional problems
- **Under-nutrition** – IUGR, LBW & later risks for insulin resistance & obesity
Mapping community resources for child development

Rate the following resources for children in your community (1=very poor, 2=poor, 3=adequate, 4=good & 5=excellent)

1. Parents’ education: Parental health, health literacy, aspirations for their children

2. Maternal & child health care
Reproductive health, ante-natal care, maternal & children’s services

3. Healthy nutrition:
pre-conceptually, during pregnancy, infancy, childhood & through adolescence

4. Responsive families & parenting:
Secure attachment, interactive care; safety and monitoring, stimulation of language, cognitive & social skills

5. Early childhood care & family support:
Access to good quality day-care, play-based pre-literacy activities & learning, family & parenting support

6. Parents involvement with school & child’s learning:
Aspirations & encouragement school of attendance and participation

7. Responsive schools
i.e. High expectations, engaging curriculum, opportunities for skill development & responsibility, acknowledgement of achievements, provide for students with special needs

8. Community environment supportive of child-rearing
Absence of poverty & violence, availability of affordable & nutritious food; commitment to family & child well-being

Community resources supporting healthy child development

Developmental processes

Healthy pregnancy:
Nutrition, avoidance of smoking, alcohol & drugs, social support, & use of antenatal health care

Quality of experience-based early brain development

Readiness for school learning
Physical health, Social & emotional development, language & other pre-literacy skill development

School engagement, academic & life skills
Sense of belonging; Problem solving skills; Social competence; Reflective awareness; Autonomy & self-efficacy; Sense of purpose

Health & participation
Health; Positive socialisation; Adaptive coping skills; Meaningful participation (social, civic & economic)
What could we do better?

- Heighten professional and community awareness of preconception health and antenatal risks for FGR maternal and later child health outcomes
- Tailor and adapt CDC guidelines for preconception health care for Indigenous contexts
- Investigate new ways of delivering preconception and sexual health care e.g. incorporate into routine health contacts; outreach youth health services etc.
- Concerted emphasis on the importance of pre-maternal and maternal nutrition - foetal and infant under-nutrition has lifelong consequences and needs to be viewed as a disease
Children develop best when the caring adults around them respond in warm, individualised and stimulating ways.

Prompt, contingent and appropriate responsiveness by the child’s mother or other primary caregiver has important consequences for the child’s sense of emotional security and long-term benefits for the child’s developing brain.
Physical growth and psychological development

Focus on children most at risk
- Undernourished
- Impoverished
- Underserved by family services

Begin early
- with the youngest children

Combine interventions to
- Improve basic health care
- Improve nutrition (breastfeeding and complementary feeding)
- Improve mother-child interactions
- Stimulate psychosocial development
Figure 1. Current & planned CRE research initiatives

- Pre-conception Education
  - Pre-natal preventive health care
    - FASD prevention & early intervention
      - Child protection intervention research
        - Maternal, infant and child nutrition programs

- School readiness
  - AEDI, Mobile Pre School Study
    - Families as First Teachers
      - Integrated child & family centres

- Parenting & child rearing skills
  - Lets Start Parenting Program
    - Lets Start Early Parenting Program
      - WHO Care for Child Development Program
        - WHO Infant & Child Nutritional Counselling Program

- School engagement & effective learning
  - NAPLAN Yrs 3, 5, 7 & 9e
    - Yrs 10 - 12 completions, work & further education
  - Strong Start- Bright Futures evaluation
    - Early years language of instruction review
      - Mobile preschool plus program
        - Use of new ITC technologies in remote schools
          - Workforce development & training review

- Adolescent lifeskills programs
  - including financial literacy,*
    - mental and physical fitness
      - reproductive & sexual health
        - preparation for parenthood

Population level monitoring of program outcomes and NT population trends in child health, education and child protection utilising the SA-NT DataLink facility and the CQI service data systems developed by the Menzies CCDE.

* FASD prevention & early intervention

**Opportunity**

**Birth**

**School readiness**

**AEDI**

**School engagement & effective learning**

**Yrs 10 - 12 completions, work & further education**

**Opportunity**

**Birth**

**School readiness**

**AEDI**

**School engagement & effective learning**

**Yrs 10 - 12 completions, work & further education**

**Opportunity**

**Birth**

**School readiness**

**AEDI**

**School engagement & effective learning**

**Yrs 10 - 12 completions, work & further education**

**Opportunity**
Aims of a proposed CRE in Indigenous child development and wellbeing

- Establish a high-level scientific knowledge network,
- Develop new scientific research-practitioner collaborations,
- Build service data infrastructure and the analytic capacity required to inform service development and uptake of preventive services and programs fostering healthy early child development of Indigenous children
- Extend the CCDE’s existing program of research by conducting the work needed to prepare fully developed research funding proposals in the areas of:
  - Indigenous adolescent pre-conception education
  - Pre-natal preventive health care
  - Foetal alcohol spectrum disorders (FASD) prevention and early intervention
  - Maternal, infant and child nutrition interventions to optimise development and reduce iron deficiency anaemia
  - Implementation of the WHO/UNICEF Council the Family of Care for Child Development (CCD) program
- Systematic dissemination of evidence on population health approaches to improving Indigenous early childhood development and education