

# Tjilku Walykumunu

Ngaanyatjarra Lands  
Child Health Study

APPENDIX ONE:  
A PRELIMINARY  
LITERATURE REVIEW

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Ngaanyatjarra  
Health Service

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## Introduction

### Research questions

*What are the social, cultural, environmental and economic factors affecting child health in the Ngaanyatjarra Lands remote Aboriginal communities?*

*What are the implications for improving child health outcomes in the Ngaanyatjarra region?*

### Rationale—why is this research important?

Indigenous Australian children living in remote and very remote communities experience a significantly higher burden of disease compared to urban, and non-Aboriginal peers. High rates of perinatal risk factors, childhood infectious diseases, environmental risk factors and reduced access to healthcare combine to provide an environment within which Aboriginal children struggle to thrive. Downstream this leads to social, economic and health disadvantages which in turn perpetuate the cycle. A broader and multifactorial approach is needed to achieve best outcomes for remote Aboriginal communities (The Lowitja Institute 2019). However,

Health risk factors, including overweight and obesity, alcohol consumption, smoking, dietary behaviours and physical inactivity, increase the likelihood of a person developing a chronic disease, or interfere with the management of existing conditions. Many health risk factors are preventable and modifiable and significant reduction is associated with improved health outcomes.<sup>1</sup>

In what follows, a preliminary search of the literature is presented using a social determinants of health approach to explore the medical, social, economic, environmental, cultural and political factors that impact on Indigenous child health in remote Australia. An early childhood development perspective is outlined and an ethnographic approach to research in this domain is explored. Finally a brief overview of the aims of the proposed research is sketched.

### The Ngaanyatjarra Lands

The Ngaanyatjarra Lands comprise some 240,000 square kilometres of desert situated in the Eastern Goldfields area of Western Australia (WA), immediately adjacent to South Australia (SA) and Northern Territory (NT) borders. The communities within the Ngaanyatjarra Lands—Blackstone, Cosmo Newberry, Jameson, Kanpa, Kiwirrkura, Patjarr, Tjirrkarli, Tjukurla, Wanarn, Warakurna, Warburton and Wingellina—are separated by distances of some 125-

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<sup>1</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023

400kms. These communities are also very isolated from mainstream urban and regional centres, positioned as they are approximately 1000km from Alice Springs to the east and Kalgoorlie to the west.

Between 2004 and 2008, people of the Ngaanyatjarra Lands successfully claimed partial and exclusive rights to almost 200 000 sq kms of Western Australia through Native Title, aspiring to use their traditional lands to fulfil their social, cultural and economic aspirations. Unlike in many parts of Australia the heritage languages (Ngaanyatjarra, Pitjantjatjara, Pintupi and other Western Desert dialects) remain strong and are used as languages of everyday communication. There is also a high level of intergenerational language transmission and the transfer of knowledge and authority in culture and language, indicating that children will maintain strong social and cultural values into the future, including caring for country.

### Child health in the Ngaanyatjarra Lands

Ngaanyatjarra Health Service (NHS) is an Aboriginal Community Controlled Health Organisation. It provides primary and preventative health care services to approximately 2000 people in the 12 communities across the Ngaanyatjarra Lands. NHS provides primary care services including: a Sexual Health Program;<sup>2</sup> Child and school Health Program; Maternal and Women's Health Program; Chronic Disease Program; Mental Health Program; Visiting Specialists Program; Aged Care, Home Care and Disability services; and a Tackling Indigenous Smoking Health Program; alongside an Alcohol and Other Drugs Program. Other support services are provided by tailored programs from NPY Women's Council<sup>3</sup> and other regional services. The Lands are also supported by social services including Environmental Health services; Ngaanyatjarra Council Regional Housing Program; and services provided by the Ngaanyatjarraku Shire.

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<sup>2</sup> The NHS Kungkaku Yangupalaku Healthy Relationships Project aimed to improve the sexual health of young people aged 10–24 years on the Ngaanyatjarra lands by increasing young people's ability to make informed decisions to enable healthy relationships, reduce risk taking behaviour and to improve access to sexual health care and related services.

<sup>3</sup> The Ngaanyatjarra Pitjantjatjara Yankunytjatjara Women's Council (NPYWC) Child Nutrition and Wellbeing Program also supports families in the Ngaanyatjarra region to increase their capacity to care for children. The Program provides support, education and early intervention to parents of children aged 0-5 years, and in particular addresses the needs of those children that experience or are at risk of inadequate growth. The Program focuses on the development and delivery of nutrition and parenting skills workshops to individual referred clients as well as larger community groups.

There are ~ 350 Aboriginal Children aged 0-9 years living on the Ngaanyatjarra Lands who are regular clients of NHS. In 2019, the proportion of low birth weight babies (<2500g) is more than double the national average at 24% (National Key Performance Indicators-June 2019). Infection rates are high with a 30% yearly incidence of otoscopic abnormalities in 0-9 year olds, skin infection prevalence of 21% in 0-9 year olds and trachoma prevalence of 19% in 5-9 year olds. In addition, among 12-24 month olds tested, the anaemia prevalence was at 20%. Trachoma screening has been held annually in the Ngaanyatjarra Lands since September 2019. Children in the Ngaanyatjarra Lands aged between 5-9 years who were present in the community were offered screening, and clean faces were checked for during screening. According to a 2022 report, there has been a decrease in the number of children with trachoma and a decrease in the prevalence from 35% in 2019 to 24% in 2022.<sup>4</sup> Although the Data below should be interpreted with caution due to the small numbers and the movement between communities.

Despite the best efforts of clinical care there are social and economic disadvantages that have downstream effects on a child's health. Factors which are believed to be contributing to poor child health outcomes in this region include: substandard housing hardware and amenities, CDP changes, community isolation, poor access to transport, poor nutrition status, poor maternal health, maternal anaemia, as well as high rates of substance abuse and family violence which are believed to be playing a dominant role in the poor child health outcomes. However, the interrelationship between factors, and their influence, has yet to be mapped. While we understand, in general terms, the determinants of poor child health in remote Aboriginal communities, the Ngaanyatjarra Lands do not have the needed data to plan a sustained, targeted, long-term campaign to address the particular issues faced by their communities. NHS, working within the Ngaanyatjarra group, aspires to lead community driven solutions to address the ongoing poor health of children. Clear baseline health and social determinants of health (SDOH) data for the Ngaanyatjarra Lands and an analysis of trends within the context of recent programs and policy changes will provide data to allow communities to establish their own targeted community led interventions and advocacy to best address their unique health profile. In the long term this will assist in

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<sup>4</sup> Ngaanyatjarra Lands Community Trachoma Program Report – 2022 (internal document), WA Country Health Service – Goldfields, Government of WA Country Health Service.

reducing health disparity priorities noted in the Closing the Gap Report 2022.<sup>5</sup> Therefore, NHS seeks to investigate and understand the collective medical, social, cultural and environmental factors that contribute to poor child health outcomes on the Ngaanyatjarra Lands, and also to gain insight into family perceptions and understandings of child health.

## Preliminary literature review

### Indigenous child health in Australia – What we know

Aboriginal and Torres Strait Islander peoples experience significantly poorer health compared to non-Indigenous Australians, starkly marked by a 10-year gap in life expectancy (Commonwealth of Australia 2019). The underlying factors for this disparity are complex, interrelated and intergenerational, often creating an inescapable cycle. The wide gaps in the early life outcomes of Indigenous and non-Indigenous populations have been evidenced by:

- the significant gap between the mortality rates of Indigenous and non-Indigenous children aged under 5
- the higher rate of poor health conditions, low birth-weight, hospital admissions and poor nutrition among Indigenous children compared with other children
- the higher prevalence of clinical, behavioural and emotional disorders among Indigenous children (Wise 2013: 1)

The Closing the Gap target to halve the gap in child mortality rates by 2018 has seen progress in maternal and child health, although improvements in mortality rates have not been strong enough to meet the target.<sup>6</sup> Although, as noted in the 2020 Closing the Gap Report, there are signs of improvement:

- Since the 2008 target baseline, the Indigenous child mortality rate has improved slightly, by around 7 per cent. However, the mortality rate for non-Indigenous children has improved at a faster rate and, as a result, the gap has widened.
- Some of the major health risk factors for Indigenous child mortality are improving. There is a need for further research to understand why these improvements have not translated into stronger improvements in Indigenous child mortality rates.<sup>7</sup>

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<sup>5</sup> <https://www.niaa.gov.au/sites/default/files/publications/niaa-closing-the-gap-annual-report-2022.pdf>

<sup>6</sup> <https://ctgreport.niaa.gov.au/sites/default/files/pdf/closing-the-gap-report-2020.pdf>

The child mortality rate for Aboriginal and Torres Strait Islander children has reduced slightly since 2008, and risk factors related to this target have improved, including attendance at antenatal care and reduced smoking during pregnancy. However, as mortality rates for non-Indigenous children have also improved, this has not yet translated into stronger improvements in Indigenous child mortality rates, and the gap has not narrowed (pp. 8, 11).

<sup>7</sup> <https://ctgreport.niaa.gov.au/sites/default/files/pdf/closing-the-gap-report-2020.pdf> pg. 15

The 2020 National Agreement on Closing the Gap provides a framework to address the entrenched inequality faced by Aboriginal and Torres Strait Islander people so that their life outcomes are equal to all Australians. The National Agreement has 17 targets including a range of health outcome measures and related determinants. Specifically, the outcome areas relate to education, employment, health and wellbeing, justice, safety, housing, land and waters, and languages (NIAA 2020).<sup>8</sup>

The National Agreement on Closing the Gap (the National Agreement) has 19 national socio-economic targets across 17 socio-economic outcome areas that have an impact on life outcomes for Aboriginal and Torres Strait Islander people. Those relevant to children and to this study are:

**Outcome 1:** Aboriginal and Torres Strait Islander people enjoy long and healthy lives.

**Target:** Close the Gap in life expectancy within a generation, by 2031.

**Outcome 2:** Aboriginal and Torres Strait Islander children are born healthy and strong.

**Target:** By 2031, increase the proportion of Aboriginal and Torres Strait Islander babies with a healthy birthweight to 91 per cent.

**Outcome 3:** Aboriginal and Torres Strait Islander children are engaged in high quality, culturally appropriate early childhood education in their early years.

**Target:** By 2025, increase the proportion of Aboriginal and Torres Strait Islander children enrolled in Year Before Fulltime Schooling (YBFS) early childhood education to 95 per cent.

**Outcome 4:** Aboriginal and Torres Strait Islander children thrive in their early years.

**Target:** By 2031, increase the proportion of Aboriginal and Torres Strait Islander children assessed as developmentally on track in all five domains of the Australian Early Development Census (AEDC) to 55 per cent.

The 2020 Closing the Gap Report, notes signs of improvement for Indigenous child health nationally:

- Since the 2008 target baseline, the Indigenous child mortality rate has improved slightly, by around 7 per cent. However, the mortality rate for non-Indigenous children has improved at a faster rate and, as a result, the gap has widened.
- Some of the major health risk factors for Indigenous child mortality are improving. There is a need for further research to understand why these improvements have not translated into stronger improvements in Indigenous child mortality rates.<sup>9</sup>

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<sup>8</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023

<sup>9</sup> <https://ctgreport.niaa.gov.au/sites/default/files/pdf/closing-the-gap-report-2020.pdf> pg. 15

Despite Australia being one of the wealthiest countries in the world, many Indigenous children have a health status and social circumstance comparable to low-income countries. Throughout infancy and childhood Indigenous children continue to suffer significantly greater ill health than non-Indigenous peers—a factor which is further exacerbated in remote communities. The importance of the contribution of the early years to adult health and illness are increasingly recognised, with the first 1000 days now seen as the beginning of lifelong health trajectories. While modification of adult behaviours including diet, physical activity and substance use can reduce disease risk, this can only modify health profiles which were established pre-natally and in the first three years. High body mass index (BMI) is also particularly prevalent among Aboriginal peoples and is associated with diabetes, chronic kidney disease,<sup>10</sup> coronary heart disease, stroke and cancer (Thurber et al. 2018: 491). Additionally, a poor diet, including low fruit and vegetable intake, has been estimated to contribute to ~19% of the Indigenous health gap in Australia (Pollard et al. 2014: 83). Tobacco smoking has also been identified as a major contributor to the high morbidity and mortality rates of Aborigines and Torres Strait Islanders, see (Lovett et al. 2017a; Lovett et al. 2017b).

Smoking is a major risk factor for cardiovascular disease, cancer, and respiratory disease (AIHW 2022). The proportion of Indigenous Australians aged 15 and over who smoke every day has fallen substantially over the past decade. In 2018–19, 37% of Indigenous Australians aged 15 and over (about 200,400) smoked every day, compared with 45% in 2008 ... The largest falls in daily smoking rates have occurred among younger Indigenous Australians. In 2018–19, 85% of Indigenous Australians aged 15–17 reported that they had never smoked, compared with 72% in 2008. The decline in daily smoking rates among Indigenous adults has occurred in non-remote areas – there has been no significant change over this period in daily smoking rates among Indigenous adults in remote areas (AIHW and NIAA 2020a).<sup>11</sup>

Finally, alcohol is associated with a significant burden of disease for Indigenous Australians compared with non-Indigenous Australians. One in six Indigenous adults report drinking in such a way as to pose long term high risk to their health and one in five report high risk drinking (or binge drinking) at least once a week (Boffa et al. 2009). Indigenous Australians are twice as likely to binge drink as non-Indigenous Australians (17% and 8% respectively) (AIHW, 2011), cited in (NPYWC 2012: 4).

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<sup>10</sup> See also (White et al. 2010).

<sup>11</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023



## Maternal and child health

Children's health, development and wellbeing can be compromised by a number of direct adverse experiences during the prenatal and postnatal periods. The three key ways in which early childhood experiences can have long-term effects have been identified as: 1. prenatal biological embedding; 2. postnatal biological embedding; and 3. the process of accumulation.

### *Prenatal biological embedding:*

Until relatively recently, the foetus was thought to be totally protected in the womb from external influences, including what the mother ate or drank or experienced (Paul, 2010). Over the past few decades, this view has been challenged by a series of revelations regarding the impact of alcohol, medications and traumatic events on foetal development. There is now strong evidence that the biological and neurological development of an individual can be shaped by environmental conditions in the womb (Coe & Lubach, 2008; Gluckman & Hanson, 2005; Martin & Dombrowski, 2008; Paul, 2010; Robinson, 2013), cited in (Moore et al. 2015: 35).

Maternal illness, poor health and nutrition in the pregnant mother, sexually transmitted infections, exposure to toxins and stressful intrauterine conditions adversely affect the health of the growing foetus. Research suggests that the environment in the womb can even influence the risk of certain diseases such as cardiovascular disease, diabetes and obesity in later life (PMSEIC 2008; Pelto et al. 1999). Pre-existing diabetes can affect both women and their babies. It is known to affect 3 to 4 times more Indigenous women than non-Indigenous women (AIHW 2010). Children aged 0–3 also show an elevated risk for diabetes, sugar problems and high blood pressure in pregnant Indigenous women (ABS 2012). During the prenatal period, a number of these factors can impact upon an infant's long-term outcomes (Guyer et al., 2009; Hertzman & Wiens, 1996; Shonkoff, 2010), this section cited in (Wise 2013: 6).

In Australia, the factors that lead to poor growth in utero are often related to inequities (Woolfenden et al., 2013), cited in Moore et al. 2015: 3). Other risk factors in pregnancy and early life that are common, or increasing in prevalence, include stress, cigarette smoking, alcohol consumption, obesity, nutrition and poverty (Brown et al., 2011; Martin & Dombrowski, 2008; Phung et al., 2003b; Platt, 2014; Robinson & Daly, 2008; Robinson, 2013) as well as exposure to environmental toxins (Currie, 2011; International Scientific Committee of the International Conference on Fetal Programming and

Developmental Toxicity, 2007; Martin & Dombrowski, 2008; Taylor et al., 2014) ... Poor growth in utero is also a major risk factor, being linked to subsequent health problems, such as heart disease and hypertension and low birth weight, that increase the risk of developing conditions such as obesity and diabetes in the child's later years (Centre on the Developing Child, 2010; Massin et al., 2001; Shankaran et al., 2006), cited in (Moore et al. 2015: 16).

Infants born preterm are at greater risk of problems both in the short and longer term (Luciana, 2003; Platt, 2014). These problems include infectious and non-infectious respiratory problems, neonatal jaundice, epilepsy, cerebral palsy, visual impairments, cognitive impairment and developmental coordination disorder. Children born prematurely or very small are also more likely to suffer from depression (Patton et al., 2004). The risks of adverse outcomes are highest amongst those born at less than 32 weeks gestation, and decline with increasing gestational age (Platt, 2014), cited in (Moore et al. 2015: 17). The health risks of low birth-weight have been well established. According to the National Perinatal Statistics, twice the proportion (12%) of live-born babies of Indigenous mothers were low birthweight compared with those born to non-Indigenous mothers (6%) (Li et al. 2012), cited in (Wise 2013: 5). In one study (Hoy & Nicol 2019a), a predisposing effect of low birth weight on adult deaths was confirmed. This phenomenon, occurring in the context of dramatically improved survivals of lower birth weight infants and children since the early 1960s, helps explain the current epidemic of chronic disease in Aboriginal people. If birth weights continue to improve, so excess deaths from this source should progressively be minimized.

In 2015 maternal age was <25 years for almost 50% of Australian Aboriginal births and one in five mothers were from remote or very remote areas (AIHW 2017). The maternal anaemia prevalence (Hb< 110) in one study of two remote communities in the Top End has been reported at 50% (Bar-Zeev et al. 2014), the prevalence of gestational diabetes at 10% (AIHW 2017) and gestational hypertension at 20%. In 2014-2015, 13% of remote residing Australian Aboriginal mothers reported they consumed alcohol during pregnancy, while 42% of mothers smoked/chewed tobacco (ABS 2016). Low birthweight and prematurity risk are heightened by other perinatal factors, including smoking in pregnancy, alcohol use through pregnancy, sexually transmitted infections, diabetes, anaemia and younger maternal age. Access to, and uptake of, antenatal services among pregnant Indigenous women is another area of inequality. According to national statistics, Indigenous women have fewer antenatal visits than non-Indigenous mothers, (Wise 2013: 6), see also (Kildea et al. 2016).

### *Postnatal biological embedding*

Biological embedding can also occur after birth, with the youngest children being most susceptible. Early stress becomes deeply embedded in the child's neurobiology, with a wide range of long-term effects on cognition, emotion and behaviour (Del Giudice, 2014; Thompson, 2014). Early life social and environmental stressors, such as childhood abuse, neglect, poverty and poor nutrition, have been associated with an increased risk of common metabolic and cardiovascular diseases later in life, the emergence of mental and physical illness (such as anxiety, mood disorders, poor impulse control, psychosis and drug abuse) and increased risk for psychopathology, from depression and conduct disorders to autism and schizophrenia (Del Giudice, 2014; Miller et al., 2011a), cited in (Moore et al. 2015: 37).

### *The process of accumulation*

Development is also shaped by the cumulative effect of experiences (Boivin & Heertzman, 2012; Halfon et al., 2010; Keating & Hertzman, 1999; Masten & Cicchetti, 2010). The cumulative effects of adverse experiences during childhood and the toxic stress they cause influence every aspect of health and wellbeing in childhood and beyond (Shonkoff et al., 2009, 2012; Anda et al., 2006, 2009). These effects cascade across all areas of developmental functioning, thereby altering the course of development (Masten & Cicchetti, 2010). Over time, the cumulative wear and tear caused by exposure to chronic stress results in physiological changes to the body with long-term adverse consequences for health and wellbeing (Evans & Schamberg, 2009; Seeman et al., 2010) ... Poverty is one such stressor... cited in (Moore et al. 2015: 39). Moreover, young children,

... have not yet developed the capacity to modify their own behavior and brain structure through thoughts and intentions – that's one of the things they have to learn from adults – so they are much more shaped by the external environmental experiences, especially their relationships with caregivers, than are older children and adults. Caregiving that is inadequate and negligent and attachments that are weak or disrupted result in adverse consequences for the child's survival, health and development (Anda et al., 2006; McCrory et al., 2010; National Scientific Council on the Developing Child, 2005, 2008, 2010; Richter, 2004), (Moore et al 2015: 17).

Individual developmental pathways are then influenced by interactions amongst risk factors (increasing the probability of a poor outcome) and protective factors (increasing the probability of a positive outcome). Risk factors tend to be pervasive—a child or family confronting adversity in one context is also likely to be facing it in others as well (Oroyemi et al., 2009). Children's exposure to risk factors is a circumstance of the socioeconomic

environment into which they are born: the lower their SES, the more risks they are likely to experience, cited in (Moore et al. 2015: 7).

*Specifically, these risks include poor nutrition, prenatal alcohol exposure, maternal smoking and sexually transmitted infections:*

**Poor nutrition** affects fetal health outcomes ‘where rising rates of obesity are observed among poor and uneducated populations that can be traced back to maternal fetal nutritional habits’ (Maggi et al. 2010: 628). Children need good nutrition prenatally and in the first 2 years of life to develop their potential. The initiation rate of exclusive breastfeeding is lower among Indigenous women overall compared with non-Indigenous women. Indigenous babies are also breastfed for a shorter period than non-Indigenous babies (AIHW 2009, 2012a; Craig et al. 2011), cited in (Wise 2013: 5), but Indigenous women in remote region are more likely to breastfeed than their counterparts in regional and larger urban centres (AIHW 2021). The intergenerational transmission of views on breastfeeding is a factor known to impact upon women’s breastfeeding behaviours (Clifford & McIntyre, 2008), cited in (Moore et al. 2015: 32), see also (Simmonds 2002).

**Prenatal alcohol exposure** is a serious concern for child development and Fetal Alcohol Spectrum Disorders (FASD) are the leading preventable cause of non-genetic, developmental disability in Australia. In 2008, 1 in 5 Indigenous mothers with children aged 0-3 reported drinking alcohol during pregnancy (ABS 2012) and there are clear indications that FASD is more prevalent in Indigenous communities (HRSCSPLA 2012). The Foundation for Alcohol Research and Education (FARE) estimates the prevalence of FASD generally to be between 0.06 and 0.68 per 1,000 live births, whereas the prevalence of FASD among the Indigenous community is estimated between 2.76 and 4.7 per 1,000 births (Peadon et al. 2008). However, experts suggest these statistics significantly underestimate the true incidence of FASD, cited in (Wise 2013: 7).<sup>12</sup>

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<sup>12</sup> See the Marulu Unit based in Marninwarntikura Women's Resource Centre in Fitzroy Crossing in the Kimberley region of Western Australia. The Marulu Strategy is a community driven response to the high prevalence of FASD and Early Life Trauma (ELT) in the Fitzroy Valley region. Also see (Fitzpatrick et al. 2015). <https://www.marulustrategy.com.au/pages/about-us>

The pattern of drinking which is most harmful to the foetus is binge drinking (Jones et al. 2006, May et al. 2011), cited in (NPYWC 2012: 4). In the Ngaanyatjarra, Pitjantjatjara and Yankunytjatjara (NPY) region:

... binge drinking is often the norm which makes alcohol consumption difficult to quantify in terms of standard drinks. There are currently no or few formal community education initiatives surrounding FASD in NPY communities, despite an anecdotally reported high rate of FASD incidence in the NPY region...The NPYWC Child Nutrition and Wellbeing Program is also witnessing the intergenerational effects of alcohol use during pregnancy with increasing numbers of young people believed to have been exposed to high levels of alcohol in-utero now becoming parents themselves. (NPYWC 2012: 4-5)

The impact of paternal alcohol consumption on children's outcomes may also be important for Ngaanyatjarra children as the father drinking alcohol before conception can impact on motor and cognitive development (Conner et al. 2020).

**Maternal smoking** rates in Australian Aboriginal women are triple that of the general population, with little evidence for successful interventions. Smoking is a risk factor for pregnancy complications and is associated with poor outcomes such as low birth-weight, preterm birth, small for gestational age and perinatal death (Laws et al. 2006; AHMAC 2012). In 2010, a higher proportion of Indigenous mothers (49.3%) reported smoking at some stage during pregnancy compared with non-Indigenous mothers (12.1%). Further, a lower proportion of Indigenous mothers (9.6%) stopped smoking during the second half of pregnancy compared with non-Indigenous mothers (18.4%) (Li et al. 2012). Data collected by the ABS in 2008 when children were 0–3 years were similar: 42% of Indigenous mothers reported they had smoked during pregnancy, although 24% had smoked less after they found out they were pregnant (ABS 2012), cited in (Wise 2013: 6). Additionally, exposure to second and third hand smoke when others in the household are smoking, especially with many smokers in the house, is noted as a contributing factor.

**STIs and the impact on birthweight**<sup>13</sup> STIs are associated with a number of poor perinatal outcomes including low birth weight of live born babies (LBW). Nationally Aboriginal babies experience an LBW rate (11.6%), which is more pronounced in very remote communities of (13.4%), these proportions are double that experienced by that of other Australians (6.5%) (AIHW 2017; AIHW 2018). The low birth-weight category includes babies born as preterm who

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<sup>13</sup> This section is drawn from A. Tangay (2019), see also (Silver et al. 2014).

are in the range of the weight for gestational age and also babies at full-term gestation who are small for gestational age. A study with a cohort of 995 people from a remote Aboriginal community (Hoy & Nicol 2019b) confirmed the findings of the extensive body of evidence that a child's time in-utero has the potential to affect health throughout life (Australian Health Ministers' Advisory Council 2017; Westrupp et al. 2019). There are many contributing risk factors identified for low birth-weight, including access to culturally appropriate care, smoking, stress, low and high maternal age and social determinants of health (AIHW 2018). However, a large proportion of low birth-weight is not explained by these risk factors (Schultz et al. 1991). STIs are reported as a predictor of premature birth and low birth-weight (AIHW 2018; Liu et al. 2013; Schultz et al. 1991), but are not always considered (AIHW 2017).<sup>14</sup>

There are disproportionately high rates of STIs notified for Aboriginal and Torres Strait Islander people living in remote Australia compared to their urban counterparts and non-Indigenous Australians more generally. *Notifications of gonorrhoea and chlamydia (CT) are 3 to 24 times higher among Aboriginal and Torres Strait Islander people than non-Indigenous Australians; highest in remote (gonorrhoea)* (King et al.2022). Trichomonas is not a notifiable infection except in the NT but has also been reported in studies at very high prevalence rates in remote Aboriginal and Torres Strait communities (23.9% among females and 6.7% among males) (Guy et al. 2015; Smith et al. 2005), whereas for urban non – indigenous peoples, prevalence is less than 1% (Abrahams 2022). Along with the high risk of congenital Syphilis, STI's remain a significant public health issue in remote Australia.

Systematic reviews have reported that STIs are associated with adverse birth outcomes. A recent meta-analysis showed that Chlamydia infection during pregnancy is associated with a higher risk of preterm birth (OR 1.57), PPROM (OR 4.34), stillbirth (OR 1.58), low-birthweight babies (OR= 2.20), and babies small for gestational age (OR 1.19) (He et al. 2020). Similarly, in a systematic review of the association between gonorrhoea and adverse birth outcomes (Vallely et al. 2021), Gonorrhoea was associated with significant adverse birth outcomes and was stronger in low and middle-income countries. (low birth weight OR=1.66, premature rupture of membranes OR=1.41, and premature birth OR=1.55 and perinatal

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<sup>14</sup> See also (Huang et al. 2008). Also national standard guidelines no longer recommend routine STI screening as rates are not high enough for this to contribute to population health outcomes: reflecting the minority status of Aboriginal women and the critical importance of identifying them as a group needing a specific guideline. <https://www.health.gov.au/resources/pregnancy-care-guidelines/part-f-routine-maternal-health-tests>

mortality OR=2.16). Trichomoniasis (*Trichomonas*) in pregnant women is associated with adverse outcomes (low birth weight OR=2.12, premature rupture of membranes OR=1.87, and premature birth OR=1.27) (Van Gerwn et al. & Silver 2021). These reviews indicate that low birth weight is approximately twice as likely to occur if the pregnant woman has an STI during pregnancy.

#### *The cumulative effect of adverse experiences*

The cumulative effect of adverse experiences in early childhood ‘spreads across multiple domains of development, which impacts upon the course of development and can have life-long health effects’ so that one bad adverse experience tends to lead to another (Moore et al. 2015: 40). Indigenous infants in Australia are more likely to be still-born, have low birthweight and suffer from anaemia and malnutrition than non-Indigenous children (Pollard et al. 2014: 83). They also have 10 times the mortality rate for respiratory conditions. The lower respiratory infection (LRI) rate in Indigenous children is at least as high as that of children in developing countries; the frequency of hospitalisations of Indigenous infants is triple that of non-Indigenous Australian infants (201.7 vs. 62.6/1000, respectively). While Indigenous Australian children have many risk factors for LRIs described in developing countries, there is little specific data, and hence, evidence-based intervention points are yet to be identified (O’Grady & Chang 2010).

Moreover, Indigenous Australian children present to primary health care services a median of 23 times in their first year of life.<sup>15</sup> McDonald et al. (2008) found that in the NT an Indigenous infant aged between four weeks and one year is seven times more likely to be admitted to hospital than a non-Indigenous child of the same age. The majority of these admissions were for respiratory, diarrhoeal and parasitic diseases (69%), while the average number of conditions associated with each episode of hospitalisation is 2.7. This high burden of preventable respiratory, enteric, ear, eye and skin infectious disease is largely attributed to unsatisfactory living conditions and inadequate hygiene practices (McDonald et al. 2008). This is further discussed below.

Additionally, 33% of consultations have an associated antibiotic prescription and 47% of children have received six or more antibiotic prescriptions by the age of one (Cunningham et al. 2019). This high rate of antibiotic prescription is driven by the high rate of infection—

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<sup>15</sup> <https://www.who.int/bulletin/volumes/86/4/07-043034/en/> See also (Kearns et al. 2013).

almost half of presentations are for an infectious disease (Hendrickx et al. 2018). Many infectious conditions are endemic or hyper endemic among children in remote communities, including trachoma (6.9%) (Cowling et al. 2016), impetigo (45%) (Bowen et al. 2015) and otitis media (90%) (Morris et al. 2005) amongst others. Anaemia prevalence among infants aged 6-24 has been reported at 42%, and up to 95% experience at least one episode of anaemia by 2 years of age (Aquino et al. 2018). The high rate of antibiotic use resultant from the high endemicity of multiple infectious diseases will likely lead to significant rates of antimicrobial resistance within this already vulnerable population, stymying future efforts to address child health and contributing to the global health risk of antimicrobial resistance (Schultz 2018). In addition, child illness is not merely an acute episode, but can have chronic effects. Impetigo can lead to acute post streptococcal glomerulonephritis, acute rheumatic fever and rheumatic heart disease (May et al. 2016), otitis media results in a high rate of hearing loss, trachoma to blindness, anaemia to cognitive and neural deficits, and even seemingly minor respiratory tract infections can increase the risk of asthma (Homaira et al. 2017; Kusel et al. 2007).

*Indigenous children are also more likely than non-Indigenous children to suffer from health conditions such as acute rheumatic fever, pyoderma, skin infections, trachoma or impaired hearing and dental caries:*

**Acute rheumatic fever** Rheumatic heart disease (RHD), caused by acute rheumatic fever (ARF), is a disease of poverty, poor hygiene and poor living standards. Despite a dramatic reduction of RHD in Australia overall, it continues to be a major contributor to childhood and adult cardiac disease in Indigenous communities throughout northern and central Australia (Parnaby & Carapetis 2010), see also (Harrington et al. 2006). Steer et al. (2002: 230) found that in Aboriginal communities in the NT ‘the prevalence of rheumatic heart disease was 11.8 per 1000 (all ages), and the incidence of acute rheumatic fever in children was 254 per 100 000’. As they emphasise, ‘these figures are among the highest in the world’. Steer et al. state (2002: 230) that a study of the cumulative incidence of rheumatic fever in Indigenous Australians ‘suggested that variations in incidence between populations is due to differences in streptococcal exposure and treatment, rather than any difference in genetic susceptibility’. They also note (2002: 232) that international studies have shown that high incidence rates of acute rheumatic fever were due predominantly to overcrowding and poor nutrition in early childhood, and this played a primary role in susceptibility to ARF.

**Pyoderma (“skin sores”)** Indigenous Australian children have very high rates of pyoderma (also known as “skin sores”). Pyoderma is endemic in many Aboriginal communities and contributes to the high prevalence of chronic renal disease and rheumatic heart disease (Lehmann et al. 2003: 418). The high prevalence of pyoderma is also the most likely reason



for some Aboriginal communities having the highest reported incidence of acute rheumatic fever worldwide (Lehmann et al. 2003: 415).

**Otitis Media** Indigenous children have the highest reported rates of otitis media (OM), commonly known as middle ear infection, and burst eardrums in the world. Nine out of 10 young Indigenous children who live in remote communities have some form of ear disease, and one in six has burst eardrum(s). Long-term middle ear damage causes hearing loss, which impacts on the development of speech and language, and is linked to educational disadvantage and behavioural problems.<sup>16</sup> Key risk factors for otitis media in Aboriginal children in Australia are largely social and environmental factors such as overcrowded housing, poverty and limited access to services. Despite this, little is known about how to address these risk factors. Housing-related issues were the most frequently reported determinants for otitis media (56%) (DeLacy et al, 2020). Population surveillance across remote Northern Territory and Western Australian communities found that almost 90% of young children had otitis media (generally bilateral) and 14% to 20% had chronic suppurative otitis media (Leach & Morris 2017; Leach et al. 2014; Leach et al. 2016).<sup>17</sup>

**Anaemia** In the Northern Territory (NT), 15% of pregnant women and up to 25% of children aged 0-5 years are anaemic. Anaemia is associated with adverse effects on physical and cognitive development in the early years and reducing potential for educational attainment and employment in later years. The National Child Health Care Report (2012-2013) and the Trends over Time: Key Indicator of Priority Evidence-Practice Gaps in Child Health (2007-2013) indicate that the best practice guidelines for anaemia screening, treatment and follow-up are poorly implemented and have not improved over time.<sup>18</sup>

**Dental caries** In children under 6 years of age, early childhood caries (ECC) is a condition characterised by the presence of one or more decayed, missing, or filled primary teeth (Pacey et al. 2010: 2). Although dental caries is a largely preventable disease, it remains one of the most common chronic diseases of childhood with significant impact not only on a child's dentition but also on their general health and quality of life through pain, tooth loss, sleep disturbance, disruption in eating habits and, possibly, impaired speech development (Neumann et al. 2011: 367).

**Trachoma** Trachoma is a contagious eye infection caused by the bacterium *Chlamydia trachomatis*. Repeated infections in childhood can lead to scarring and changes in the eyelid, which in turn can result in blindness. When found early, trachoma can be easily treated with a single dose of the antibiotic azithromycin. It is claimed that trachoma rates for Indigenous Australian children in some remote communities have not changed over the past 20 years. Australia is now the only high income country in the world that has not eradicated this disease (McDonald et al. 2008).

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<sup>16</sup> Menzies School of Health Research. (2023). *Ears*. Accessed 26 October 2023

[https://www.menzies.edu.au/page/Research/Indigenous\\_Health/Child\\_Health\\_and\\_development/Ears/](https://www.menzies.edu.au/page/Research/Indigenous_Health/Child_Health_and_development/Ears/)

<sup>17</sup> Australian Institute of Health and Welfare (2019). *1.15 Ear health*. Retrieved from Aboriginal and Torres Strait Islander Health Performance Framework: <https://www.indigenoushpf.gov.au/measures/1-15-ear-health> Accessed 26 October 2023. See also: Doyle, J. and Ristevski, E. (2010).

<sup>18</sup> Menzies School of Health Research (2023). *Anaemia*. Accessed 26 October 2023:

[https://www.menzies.edu.au/page/Research/Indigenous\\_Health/Child\\_Health\\_and\\_development/Anaemia/](https://www.menzies.edu.au/page/Research/Indigenous_Health/Child_Health_and_development/Anaemia/)

**In summary,**

- **Cumulatively adverse health factors impact on Indigenous children’s growth, and on their wellbeing, cognitive development and educational outcomes. Leading ultimately to a greater likelihood of developing chronic disease in adulthood and to social disadvantage throughout life. (McDonald et al. 2010: 43)**
- **Adverse experiences known to be associated with later negative outcomes include: sustained poverty; recurrent physical, emotional or sexual abuse; emotional or physical neglect; parental alcohol or drug abuse; an incarcerated household member; homelessness; parental depression, suicidality or mental illness; and family violence. (Moore et al. 2015: 2)**
- **For these diseases and infections to be eradicated, requires addressing the underpinning determinants of poverty, social and living conditions.**

The discussion now turns to a social determinants approach to health.

### **Social determinants of health (SDOH)**

Health is largely determined by social, environmental, economic and political circumstances.

The World Health Organization (WHO) states that the ‘social conditions in which people live powerfully influence their chances to be healthy. WHO defines the social determinants of health as the “conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life” (WHO 2017). This model rests on the association of various social factors (or determinants), such as income, class, occupation, education, nature of housing, and social cohesion, as well as a variety of early life exposures. These determinants can be both enabling and damaging, and their distribution reflects social policy, economic arrangements, and political ideology (Mikkonen & Raphael 2010), cited in (Chenhall & Senior 2017: 180).

Indeed, factors such as poverty, food insecurity, social exclusion and discrimination, poor housing, unhealthy early childhood conditions and low occupational status are important determinants of most of disease, death and health inequalities between and within countries. This is especially so for indigenous populations around the world: ‘Indigenous Peoples are among the most marginalized and disadvantaged populations in both developed and developing countries...[and]...they experience common problems in relation to their traditional food systems, food security and health’ (Fieldhouse & Thompson 2012: 217).

In every society, including Australia, differences in socioeconomic status (SES) translate into inequalities in child development (Goldfeld & West, 2014; Hertzman et al., 2010; Strategic Review of Health Inequalities in England post-2010 Committee, 2010). These development discrepancies are evident across cognitive, social, behavioural and health

outcomes, cited in (Moore et al. 2015: 1). See also (Boulton 2016b; Daly & Smith 2005; Irwin et al. 2007; Kagan & Britto 2005; Marmot 2011). Maggi et al. (2010), in their consideration of the critical social determinants of child development and the complex ways in which these can influence health trajectories, state that the first years of life represent a critical period during which trajectories of health vulnerability are determined by the complex interplay between biological, genetic, and environmental conditions:

Social determinants play a critical role in the early phases of conception, pregnancy and post-natal periods of children's development. Sensitive periods in brain and biological development start prenatally and continue throughout childhood and adolescence. The extent to which these processes lead to healthy development depends upon the qualities of stimulation, support, and nurturance in the social environments in which children live, learn and grow. By school age, development has been influenced by factors at three levels of society: family, neighbourhood/village and the broader societal level. Socio-economic gradients in health across the life course begin as socio-economic gradients in early child development. Thus, the social environment is a fundamental determinant of early child development and, in turn, early child development is a determinant of health, well-being, and learning skills across the balance of the life course. (Maggi et al. 2010: 627)

They discuss the three separate processes that are considered to influence children's development—*latency*, *pathways* and *cumulative* processes—and are thought to operate in complex and interrelated manners (Maggi et al. 2010: 628). These processes,

... interact with daily experiences to 'explain' health status across the life course at various levels of social aggregation. Health status is an emergent property of the ongoing interactions between the individual (at each stage of development across the life course) and the conditions he or she encounters in the family, neighbourhood, and broader socio-political environments. (Maggi et al. 2010: 628)

Factors including 'adequate maternal nutrition, maternal mental and physical health, parental stress and depression, parenting styles, unemployment, limited or no income, housing conditions, and neighbourhood quality are some of the most important determinants of early child development identified in recent research' (Maggi et al. 2010: 627). Accordingly, because of 'the potential for intervention on environmental conditions to improve health outcomes of populations, researchers, governments, and policy makers have been increasingly attempting to better understand the conditions under which children reach optimal health and developmental outcomes' (Maggi et al. 2010: 627).

According to the Fair Foundations framework (VicHealth, 2013, cited in (Moore et al. 2015:3) there are three layers of influence that lead to inequitable, socially produced, systematic differential health and wellbeing outcomes:

1. the socioeconomic, political and cultural context, encompassing governance, policy, and dominant cultural and societal norms and values;
2. daily living conditions, which are the circumstances in which people are born, grow, live, work and age; and
3. individual health-related factors, that is, the health-related knowledge, attitudes and behaviours of individuals that result from, and are responses to, their socioeconomic, political and cultural context, social position and daily living conditions. (Moore et al. 2015: 3)

Community, social and environmental factors which lead to ill-health are present at heightened levels within remote Indigenous communities in Australia. Daily living conditions that cause inequity during childhood include: family environments, social participation and access to health-care services, as well as growing up in a disadvantaged community.

Health is related to an individual's environment and circumstances such as where they live, their education level, income and living conditions along with their access to and use of health services (WHO 2017). For Aboriginal and Torres Strait Islander people, factors such as cultural identity, family and kinship, country and caring for country, knowledge and beliefs, language and participation in cultural activities and access to traditional lands are also key determinants of health and wellbeing (AIHW and NIAA 2020). These factors are interrelated and combine to affect the health of individuals and broader communities.<sup>19</sup>

#### **In summary,**

- **Children are particularly sensitive to social determinants, especially in the early years (Dyson et al., 2010; Hertzman, 2010; Strategic Review of Health Inequalities in England post-2010 Committee, 2010).**
- **During this period a number of capabilities and competencies develop (Hertzman & Wiens, 1996; McCain & Mustard, 1999; Shonkoff, 2012).**
- **Early childhood has a major role in shaping health in later life (Dyson et al., 2010).**  
(cited in Moore et al. 2015: 2)

The review now focuses on specific social, environmental, cultural and political factors that impact on Indigenous child health.

#### **Social Factors**

An AIHW analysis of results from the Australian Bureau of Statistics (ABS) health survey data estimated that around one-third (34%) of the health gap between Indigenous and non-Indigenous Australians was due to social determinants (employment and hours worked, highest non-school qualification, level of schooling completed, housing adequacy and household income) and just under one-fifth (19%) of the gap was due to 'health risk factors' (risky alcohol consumption, high blood pressure, overweight and obesity status, inadequate

<sup>19</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023

fruit and vegetable consumption, physical inactivity and smoking). The remaining health gap (of around 47%) includes differences in access to health services and the impact of cultural and historical factors on health (AIHW 2018).<sup>20</sup>

There is overwhelming evidence that social factors have profound influences on health (Halfon et al., 2010; Strategic Review of Health Inequalities in England post-2010 Committee, 2010; WHO Commission on the Social Determinants of Health, 2008), and that the circumstances in which children are born determine their exposure to environments that promote or compromise healthy development, cited in (Moore et al. 2015: 2).

The most salient features of the family itself are its social and economic resources. Social resources include parenting skills and education, cultural practices and approaches, intra-familial relations, and the health status of family members. Economic resources include wealth, occupational status and dwelling conditions (Moore et al. 2015: 20). Family environment conditions have a particularly strong impact on early childhood development. Any chronic problem, either physical or mental (especially of the mother or primary caregiver), such as intimate-partner violence (Volpe 1996), maternal depression (Shonkoff et al. 2000) and chronic illness, can have a deleterious effect on parent-child interactions, parental employment and early childhood stimulation and, in turn, child development (Willms 2003; NICHD Early Child Care Research Network 2002), cited in (Wise 2013: 7).

Indigenous children are in greater danger developmentally, owing to risk factors originating within the family environment, the community where the child grows up, and the type of early childhood development (ECD) programs that Indigenous children are exposed to. According to Wise (2013: 2) specific risk factors include:

- smoking during pregnancy
- drinking during pregnancy
- stressful intra-uterine conditions
- poor health and nutrition during pregnancy
- challenges faced by parents
- problems in parenting
- disadvantaged socio-economic conditions
- insufficient availability and effectiveness of early childhood development programs and services

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<sup>20</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023

For instance, in remote regions, domestic violence is significantly higher (Arefadib & Moore 2017), and this contributes to the *acts intended to cause injury* which make up the most serious offence of about 40% of Aboriginal prisoners. In WA Australian Aboriginal men are incarcerated at a rate of 18 times that of non-Indigenous Australian men, while for women the rate is over 25 times (ABS 2021). Australia-wide up to 80% of incarcerated Australian Aboriginal women are mothers of a dependent child (Senate Legal and Constitutional Affairs References Committee 2013). Parental incarceration has significant trauma like effects on children, and leads to: increased aggressive behaviour, attention problems and decreased verbal ability (Geller et al. 2012), poor mental health including depression and suicidal ideation (Khan et al. 2018), increased rates of illicit drug use and risky sexual behaviours through adolescence and adulthood (Bellis et al. 2014), poorer education outcomes (Murray et al. 2012), and higher premature mortality (Wildeman et al. 2014). In addition to the effects on current children, pregnant mothers who are or have been incarcerated demonstrate fewer health seeking behaviours (Martin et al. 1997).

### Environmental Factors

A variety of interacting and interdependent experiences and environmental conditions influence development in early childhood. This understanding is based on theoretical frameworks in developmental psychology including Bronfenbrenner's Bioecological Model (Bronfenbrenner 1979; Shonkoff 2010) as well as frameworks put forth in social epidemiology which address the social determinants of health, cited in (Wise 2013: 6). The interconnectedness of social problems, and the strong influence of environmental factors on children's development support the use of an ecological framework in policy and service delivery (Moore et al. 2011: 3). Despite this, governments are placing most reliance upon 'killer' programs—preferably evidence-based—that address the presenting problems rather than looking at the systemic (ecological) conditions that lead to problems in the first place (Moore et al. 2011: 9).

There are, for example, strong links between various housing variables and child development outcomes. Yet there has been little research into the problem of poor hygiene and unsanitary living conditions in remote Indigenous communities in Australia and the benefits of population-level interventions. Efforts to improve Aboriginal children's health have to date mostly focused on the treatment or eradication of diseases by the use of vaccines

and improved medical case management. The impact of poor personal, domestic and community hygiene on children's health has largely been ignored. According to researchers (McDonald et al. 2008), taking this approach could have contributed to the slow rate of improvement in Aboriginal child health.

### *Home habitat*

In regard to the impact of housing upon child and family, there are strong links between various housing variables and child development outcomes, some of which (such as the negative effects of toxicants on various dimensions of child development) are irreversible and continue on into adulthood (Dockery et al., 2010; Harker, 2006; Solari & Mare, 2012). Children living in bad housing conditions (defined by overcrowding, poor condition or unfit housing or being homeless and in temporary accommodation) have up to 25% higher risk of severe ill-health and disability during childhood and early adulthood; an increased risk of meningitis, asthma and slow growth; and an increased risk of suffering mental health problems and problems with behaviour (Harker, 2006; Shepherd et al., 2012a). There is an association between overcrowded housing conditions and preterm delivery (Niedhammer et al., 2012). (Moore et.al. 2015: 22)

McDonald et al. (2008; 2009) found that a combination of crowding, non-functioning essential housing infrastructure, and poor standards of personal and domestic hygiene underlie the high burden of infection experienced by children:

Household crowding leads to more frequent interpersonal contact and increases the risk of cross infection. High burdens of infection, combined with inadequate nutrition, are considered to account for approximately 50% of all cases of anaemia among NT Indigenous children aged less than five years. (McDonald et al. 2008)

They concluded that there is a need to address policy and the management of infrastructure, as well as key parenting and childcare practices that allow the high burden of infection among children to persist. See also (Bowes & Grace 2014; Mildon & Polimeni 2012).

While it is generally recognised that poor living conditions and poor hygiene underlie the high burden of infection experienced by Indigenous children living in remote communities, according to McDonald et al. (2010) there has been little research on this topic:

Efforts to improve Aboriginal children's health have focused to date largely on using vaccines and improved medical management to treat or eradicate diseases (Listorti and Doumani, 2002; McDonald et al., 2008). Past health promotion initiatives that aimed to reduce the prevalence of common childhood infectious diseases tended to focus on preventing the transmission of specific infections (Wong et al., 2001; Ewald et al., 2003). The impact of poor personal, domestic and community hygiene on children's health and the need for more general health-promoting approaches have largely been ignored (Commonwealth Department of Health and Aged Care, 1999; Listorti and Doumani, 2002). This has meant slow progress in improving Aboriginal child health in remote communities. There has been little or no research into the problem of hygiene as it relates to environmental living

conditions that lead to poor health outcomes in remote Australian Aboriginal communities. (McDonald et al. 2010: 43)

Bailie & Wayte (2006) discuss the importance of living conditions, and how the nature of the benefits and risks of housing to health is diverse, and may be related to the availability of housing, the specifics of housing design and construction, the condition of the house and surrounds, and to community design:

The inadequacy of housing for Indigenous Australians has been widely acknowledged. 'Adequacy' of housing includes quality of basic services, materials, facilities and infrastructure; habitability; affordability; accessibility; legal security of tenure; and location and cultural adequacy. Housing may affect health through both direct and indirect ways. Direct influences include the effect of the material conditions of housing on physical health and the effect of the associated social conditions on mental health and well-being. Housing has an indirect influence on health, at both the individual and neighbourhood or group level, by being an important component of general socioeconomic status and influencing access to services. (Bailie & Wayte 2006: 178)

Bailie et al. (2012) aimed to determine whether improvement in poor housing infrastructure in Indigenous communities results in reduction in common childhood illness, and to identify important mediating factors in this relationship. Their study (Bailie et al. 2012) focused on the impact of housing programs on the occurrence of common childhood illness as reported by the children's carers. They found that:

The building programs in the 10 communities that were the subject of the study have not resulted in a consistent reduction in carers' reporting of common childhood illnesses, either for specific illnesses or for these illnesses in general. There is also no consistent evidence that, in the circumstances of these communities at the time of this study, there are specific factors (such as levels or changes in household crowding or hygienic conditions), which modify the potential effect of improved household infrastructure... Importantly, individual children who experienced an improvement in infrastructure were about four times more likely to experience an improvement in hygienic conditions. Conversely, children who experienced deterioration in infrastructure were about five times more likely to experience deterioration in hygienic conditions. However ... there was no clear overall improvement in household hygiene at a community level as a result of the building programs... In the context of the wide recognition that high levels of crowding facilitate the transmission of infectious disease, the results of our analysis indicate that the ongoing high levels of crowding and the generally poor levels of household hygiene in these communities are likely to be important factors in the apparent failure of the building programs to impact on common childhood illnesses. (Bailie et al. 2012: 829)

These findings reinforce the need for building programs to be supported by a range of social, behavioural and community-wide environmental interventions in order for the potential health gains of improved housing to be more fully realised.



The National Aboriginal and Islander Health Plan 2021-2031 notes that,

[I]mplementation across each priority area will need a holistic approach that considers the cultural determinants across the life-course. For example, it notes that to ensure the health and wellbeing of Indigenous Australians, contemporary housing must embed culturally-responsive design, including consideration of kinship, family and community living arrangements (Department of Health 2021).<sup>21</sup>

Functional housing encompasses basic facilities, infrastructure, and habitability. Poorly maintained infrastructure and inadequate basic facilities can lead to the spread of infectious and bacterial diseases.

- In 2018–19, 1 in 3 (33%) Indigenous households were living in housing with one or more major structural problems, such as major cracks in walls or floors, sinking or moving foundations, or major electrical or plumbing problems. This was a similar proportion to 2012–13.
- Those living in *Remote and very remote* areas were most likely to live in overcrowded housing or homes with major structural problems (AIHW 2020b).<sup>22</sup>

### *Household hardware*

Household hardware enabling healthy living practices is increasingly noted as a source for public health interventions. Findings from McDonald et al. (2009) indicate that the environmental intervention most urgently required is additional housing with robust essential health hardware:

However, while additional housing will reduce some of the social and health problems caused by high levels of household crowding, it will not necessarily resolve the problem of unsanitary living conditions and high rates of infection. The extent that reduced household crowding or improvements in infrastructure will achieve improved health is limited if inappropriate domestic and personal hygiene practices continue unchanged. This points to the widely recognised need for, and current efforts to implement “whole-of-government” or inter-sectoral approaches to improve the living conditions in these communities. However, there is no good evidence at this stage that these efforts have had a positive impact and while it may take some time for any impact to become apparent there is a need for more immediate and focussed efforts to improve circumstances for children. (McDonald et al. 2009)

A number of physical barriers have been identified that discourage householders from

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<sup>21</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023

<sup>22</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023

practising safe hygiene, significant among these barriers is the non-functioning of health hardware items (for example - shower, shower stalls, taps, toilets, sink/basins, drains) (McDonald et al. 2009). In NSW, a housing improvement initiative (Housing for Health) fixed or replaced 51,700 items of health-related hardware in 2,230 Aboriginal homes, leading to a 40% reduction in hospital separations (Aboriginal Environmental Health Unit 2010). This initiative demonstrates not only the low level of maintenance and repairs which led to poor quality housing in Aboriginal communities, but also the low cost/high benefit ratio of addressing the environmental determinants of health.

Nevertheless, despite Australia's wealth, living conditions in remote communities remain poor. This was highlighted in a survey of Aboriginal housing in the NT (McDonald et al. 2009) indicating that only between 38% and 69% of houses had all the functioning components required to effectively conduct each of six key 'healthy living practices'. Healthy living practices include: wash people (54%), wash clothes (68%), functioning toilet (55%), remove waste water (61%), remove waste rubbish (69%) and prepare and store food (38%). They found that poor housing conditions and overcrowding can lead to unsanitary environments and an increase in infections, especially enteric conditions. Hand washing with soap was identified (McDonald et al. 2008) as the single intervention most likely to reduce the rate of infection among children:

The evidence showed that there is a clear and strong effect of education and hand-washing with soap in preventing diarrhoeal disease among children (consistent effect in four studies). In the largest well-designed study, children living in households that received plain soap and encouragement to wash their hands had a 53 per cent lower incidence of diarrhoea (95 per cent CI, 0.35, 0.59). There is some evidence of an effect of education and other hygiene behavioural change interventions (six studies), as well as the provision of water supply, sanitation and hygiene education (two studies) on reducing rates of diarrhoeal disease.

(McDonald et al. 2011: 63)

Taking an ecological approach, McDonald et al. (2010) aimed to identify the key factors contributing to poor hygiene in one remote Aboriginal community and to determine appropriate approaches for improving hygiene and reducing the burden of infection among children. Their key findings included that multifaceted interventions are required to ensure that household water and sanitation technology are functional, hygiene behaviour change is achieved and environments that enable good hygiene behaviour are created. The study also found that many of the factors contributing to the problem of poor living conditions and poor hygiene in remote communities are outside the control of the health system. Intersectoral

collaboration and action is thus required to identify acceptable, effective and sustainable solutions. They also stipulate that there is a lack of research into the hygienic state of the living environment and its impact on child health outcomes in remote communities.

They conclude that ‘those responsible for Aboriginal health and welfare have failed to recognize the social determinants that shape individual and group health and hygiene behaviour’ (McDonald et al. 2011: 63). Their analysis supported ‘the use of social marketing strategies as a means of creating demand for improved living conditions among Indigenous Australians living in remote communities’, an approach that was seen as more desirable than approaches that might be considered coercive or to cause embarrassment by singling out individuals, families or households’ (McDonald et al. 2011: 64).

#### **In summary,**

- **Poor living conditions, crowding and poor hygiene underlie much of the high burden of infection experienced by children living in remote Aboriginal communities.**
- **An inter-sectoral approach and multifaceted interventions are needed to address overcrowding, poor housing functionality, poor environmental health and poor hygiene practices so as to improve child health. (McDonald et al. 2010)**

Other environmental factors are also impacting on injuries, and the mortality rate from injuries in remote communities. The mortality rate from injuries among Indigenous children in Australia is approximately four times that of the non-Indigenous population, including both younger and older children (0-4 and 4-14 age groups, and both boys and girls) (AIHW 2020). The major causes are suicide, motor vehicle crashes and physical violence. Moreover, alcohol is a factor underlying all of these causes. See also (Möller et al. 2018; Thurber et al. 2017a). Another key feature of the physical environment is exposure to environmental toxins. Such exposure is now ubiquitous: toxic chemicals from everyday products contaminate the bodies of every person in developed nations, including newborn babies and young children (Baker, 2008; Curtis & Wilding, 2007; Lloyd-Smith & Sheffield-Brotherton, 2008; Paul, 2010). The main sources of these contaminations are not the more obvious sources such as crop sprays, industrial waste and air pollution, but the hundreds of common products that ordinary people use every day, such as shower curtains, water bottles, baby bottles, toys, shampoo, cosmetics, couch cushions and computers. From all of these products toxic chemical ingredients leach out and affect our bodies (Baker, 2008; Cribb, 2014), cited in (Moore et al. 2015: 23).

Lastly, it is noted that contact with natural spaces can improve health directly and indirectly (by, for example, encouraging physical activity and social contact) (Sustainable Development Commission, 2008). Access to and use of parks and open space is linked to physical, social and mental health benefits (Louv, 2005, 2011; Pearce et al., 2011; Wood, 2009), cited in (Moore et al. 2015: 23). This may be particularly important for Aboriginal children (Miller et al. 2020). Lehmann et al. (2003) also conclude that swimming pools in remote communities are associated with reduction in prevalence of pyoderma and tympanic membrane perforations, which could result in long-term benefits through reduction in chronic disease burden and improved educational and social outcomes. Although they do note that rates of drowning are also high in Aboriginal communities.

### **Economic Factors**

A growing body of evidence indicates a correlation between household income and child health in Australia and similar countries, such as the UK and Canada... The Australian evidence indicates that welfare-to-work initiatives have a negative impact on disadvantaged families and children (Cameron, 2005; Grahame & Marston, 2011; Summerfield et al., 2010), cited in (Moore et al. 2015: 2, 44), see also (Bray et al. 2014).

### **Financial security**

The introduction of the Community Development Program (CDP) in 2015 in remote Indigenous communities contributed profoundly to increased household poverty, food insecurity, domestic violence and incarceration rates (Kral 2016b; Jordan & Fowkes 2016),<sup>23</sup> all factors known to be negatively associated with child health outcomes. To compound this, these factors have also been linked to increased personal aggression and domestic violence which have further negative impacts on a child's current and future wellbeing (Murray et al. 2012).<sup>24</sup>

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<sup>23</sup> CDP was introduced on 1 July 2015 as an amendment to Labor's Remote Jobs and Communities Program (RJCP), which, in remote areas, had replaced the longstanding Community Development Employment Projects (CDEP) scheme and the universal employment services program, Job Services Australia. CDP is firmly within the social security system: participant payments are made via the unwieldy Centrelink system, and very inflexible rules are determined centrally in the Australian Government Department of the Prime Minister and Cabinet (PM&C) (Jordan & Fowkes 2016).

<sup>24</sup> In May 2021 the Australian Government announced that CDP will be replaced by a new co-designed program or programs by 2023. This new Remote Engagement Program will be developed in partnership with communities and will complement the broader New Employment Services Model being rolled out in the latter half of 2022.

In the Ngaanyatjarra Lands, Kral (2016b) found that under CDP the typical Newstart fortnightly allowance for an adult, minus various deductions, left an individual with an inadequate income. Additionally, compliance failures incurred for non-participation in the linked CDP activities and for missing appointments (fortnightly with Centrelink and monthly with the local CDP Provider) sometimes led to an 8 week penalty during which time the recipient received no Newstart Allowance.<sup>25</sup> These income penalties had severe knock on effects. For instance, if there was no money in the household, families were unable to buy power cards to supply electricity to ovens, fridges, air conditioners or heaters (depending on the season)—all factors that impact on child health.

Even with the full Newstart Allowance without penalties, there is still limited capacity to save and no expendable cash available for basic household goods such as fridges to store fresh food. Additionally, in many remote communities there are frequent disruptions to electricity supply, often related to families being unable to pay for electricity for periods of time. It has also been noted (Thurber et al. 2019: 8-9) that the price of healthy food in remote communities is significantly higher compared with major cities or regional centres, and there are limited food outlets; this, compounded by lower average socio-economic position in remote settings, may limit families' ability to make healthy food choices.

*All of these factors cumulatively impact on nutrition and child health in remote Indigenous communities and a limited income impacts on food insecurity.*

### *Food insecurity*

Socioeconomic disadvantage is linked to food insecurity.

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Conversely, food insecurity—classified as either moderate (MOFI) or severe (SEFI) is a consequence of inadequate or uncertain access to healthy food in terms of quantity or quality, and is typically associated with limited financial resources. (Fieldhouse & Thompson 2012: 218)

Food insecurity is a serious public health issue for Indigenous peoples around the globe. The promotion of healthy living and chronic disease prevention are predicated on the ability of

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<sup>25</sup> See also (Brooks 2016; Kral 2016a).

individuals and communities to make healthy choices. Having access to nutritious affordable food is one of the conditions required to make such choices possible, but one that is too often not available, see (Egeland et al. 2010; Skinner et al. 2013; Socha et al. 2010; Willows et al. 2011).

One component of food insecurity in Indigenous communities is the declining consumption of traditional foods in remote Indigenous regions. Ford & Beaumier (2011: 45) for example, investigated food insecurity in an Inuit community and found that longitudinal studies highlight declining consumption of traditional foods and increasing consumption of nutrient poor store foods. This they describe as the 'nutrient transition'. As a consequence of changing food preferences, Indigenous communities around the world have begun to adopt different dietary habits, including the consumption of sugar-sweetened soft drinks, and snack foods high in fat, sugar and salt. Such changes in dietary practices across the generations are associated with obesity, dental caries, anaemia, lowered resistance to infection and diabetes (Fieldhouse & Thompson 2012: 218). See (Boulton 2016a) for a description of changing food sources in the Kimberley region of remote Indigenous Australia.

Access to food in remote areas is a concern. Fieldhouse & Thompson (2012: 217) state that,

From both health policy and population health perspectives, current nutrition concerns centre around the two interrelated issues of food insecurity and obesity. While obesity points to issues around over-supply of cheap energy-dense food, the provision of sufficient accessible, affordable healthy food is a central concern for food security.

In one study in Canada (Ford & Beaumier 2011), the conditions and processes that constrain access, availability, and quality of food were examined in Inuit communities. Ford & Beaumier (2011) found that multiple determinants of food insecurity have operated over different spatial-temporal scales, including food affordability and budgeting, food knowledge and preferences, food quality and availability, environmental stress, declining hunting activity, and the cost of harvesting. They claim that,

... existing research provides a baseline understanding of specific components of food insecurity: anthropological research has helped to unravel the complexities of Inuit sharing and how this determines food access and availability; we have an understanding of the risks posed by contaminants; the nutrition transition is well described; and the magnitude of food insecurity documented. However, despite this progress, there is a shortage of studies characterising how food security in contemporary indigenous communities such as with the Inuit in Canada, and similarly remote Indigenous Australia, is being affected by the complex interaction of stresses operating over multiple spatial-temporal scales. In particular, research to date has largely examined only specific components of food security (i.e. food

quality or food access or food availability), yet food security is a combined property of these components which often interact in complex ways (White et al. 2007; Ericksen 2008a Ericksen 2008b; Loring and Gerlach 2009). (Ford & Beaumier 2011: 45)

Meanwhile, Fieldhouse & Thompson (2012) investigated community and government approaches to tackling food insecurity in Northern Manitoba, Canada. They found that community-based action combined with structural changes and a supportive policy environment hold out the prospect of changing the conditions of food access that underlie the ultimate success of healthy living and chronic disease prevention efforts. They also found that an important key to successful change is the engagement of youth, whose food habits and preferences have been heavily influenced by mainstream commercial food culture.

As noted above, food security is defined as ‘the ability of individuals, households and communities to acquire appropriate and nutritious food on a regular and reliable basis using socially acceptable means’ (Pollard et al. 2014: 84). An Australian study found that nutrient dense foods (meat, fruit, vegetables) are eaten relatively infrequently, and typically only at the beginning of a pay cycle (Wycherley et al. 2017). Furthermore, introduction of these foods when weaning infants is low, with sweetened drinks being given in preference (Brimblecombe et al. 2013; Leonard et al. 2017). Another study (Godrich et al. 2017), investigating the determinants of food security and how they affect children in regional and remote WA, found that food availability factors included availability, price, promotion, quality, location of outlets and variety. Food access factors included social support, financial resources, transport to food outlets, distance to food outlets and mobility. Food utilisation factors included nutrition knowledge and skills, children’s food preferences, storage facilities, preparation and cooking facilities and time to purchase food. They concluded that key food availability recommendations include increasing local food supply options. Food access recommendations included ensuring equitable formal social support and empowering informal support options. Food utilisation recommendations included prioritising food literacy programs focusing on quick, healthy food preparation and budgeting skills. They also suggested that policymakers should invest in local food supply options, equitable social support services and experiential food literacy programs, and practitioners should focus child/parent programs on improving attitude, knowledge and skills.

In another Australian study, Pollard et al. (2014) found that improving healthy food affordability in remote Indigenous communities where high unemployment and low

household income abound is fundamental to improving food security, yet these factors present a significant challenge. The study explored remote community store managers' views on issues related to improving food security in order to inform health policy. They found food security interventions in remote communities need to take into consideration issues such as freight costs, transport and low demand for nutritious foods. Moreover, in this study (Pollard et al. 2014), store managers stated that freight costs and irregular deliveries contributed to high prices and a limited range of foods. Additionally, poor store infrastructure, dependence on refrigerated and frozen goods, compromised cold chain logistics, and commonly occurring power outages affected food quality. Lastly, half of the managers said there was hunger in their community because people did not have enough money to buy food. In terms of food insecurity, Pollard et al. (2014) conclude that interventions need to incorporate understanding the social and economic issues that lead to food insecurity, poor nutrition and ultimately impact negatively on child health. Furthermore, little is known about the extent of the customary economy and the opportunities this may provide for food sovereignty (Buchanan 2014), a nation's right 'to maintain and develop its own capacity to produce its basic foods respecting cultural and productive diversity... where ... Food sovereignty is a precondition to genuine food security' (Jarosz 2014).

Finally, the phenomenon of the double burden of malnutrition is emerging globally. This includes individuals who are under-nourished in early life then obese as adults; but also households and in societies where children are under-nourished and adults obese. This life course exposure to the nutrition transition should be considered when developing interventions (Wells et al. 2020).

### Nutrition and child health

Having access to nutritious affordable food is one of the conditions required to make healthy food choices possible. Such conditions are often not available in remote Indigenous communities internationally and in Australia. In Australia healthy choices are curtailed by many factors including the range and the expense of food at community stores *and* the availability of cool thirst-quenching drinking water in hot or humid regions (Thurber et al. 2019).

Thurber et al. (2019) found that there is a high prevalence of SSB consumption in Australia, and particularly high consumption prevalence and volume among Aboriginal and



Torres Strait Islander peoples. Moreover, although ‘the measurement approaches and populations have varied across studies, there is consistent localised and national quantitative evidence of high SSB intake by Aboriginal and Torres Strait Islander children in the first 3 years of life’ (Thurber et al. 2019: 2). They noted that without a reliable electricity supply, it is not possible to cool warm tap water, hence the warm climate of many remote areas has also contributed to high sugar-sweetened beverage (SSB) intake, with SSB perceived to quench thirst better than (warm) water. This is supported by previous research demonstrating the role of temperature in beverage selection among Aboriginal and Torres Strait Islander people (Thurber et al. 2019: 9).

... the lack of palatable water can lead to high consumption of SSB and other ready-to-drink beverages in Australia and internationally. For example, research in an Australian and a Canadian remote community with poor water quality identified that it was common to mix water with cordial or tea to make it drinkable, and that soft drinks were more commonly consumed than tap water. (Thurber et al. 2019: 9)

Thurber et al. (2019: 2) conclude that there is ‘substantial potential for health gain through reducing SSB intake by young Aboriginal and Torres Strait Islander children, particularly given the disproportionate burden of obesity and dental caries experienced by this population’. Similarly, Moore et al. (2015: 59) found that providing resources (e.g. fruit and vegetables to Aboriginal and Torres Strait Islander families in rural communities) may improve the immediate circumstances of children (i.e. their nutritional intake), which may then have a longer-term impact upon their overall health.

### *Obesity*

Moore et al. (2015: 50) conclude that reducing ‘socioeconomic inequities relating to obesity amongst children requires a range of public health interventions at the individual, community and societal levels’.

In Australia, limited cross-sectional data indicate elevated overweight/obesity prevalence among Indigenous versus non-Indigenous Australian children. In one study based on data from the Longitudinal Study of Indigenous Children (LSIC), it was found (Thurber et al. 2017b: 755) that more than 10% of children already had overweight/obesity by age 3 years, with a rapid onset of overweight/obesity between age 3-6 and 6-9 years. Their findings suggest that reducing consumption of sugar-sweetened beverages and high-fat foods from an early age could have a beneficial impact on children’s BMI trajectories; despite the small magnitude of observed effects, reducing consumption could have a substantial impact at the

population level given the high level of current consumption. However, they state that it is imperative that programs and policy are developed in partnership with Indigenous communities and address the broader sociocultural and environmental context in which health behaviors occur and are sustainable.

In addition, a substantial proportion (>40%) of the excess obesity prevalence among Aboriginal people is explained by ‘known’ proximal risk factors: physical activity, screen time, education, remoteness and area-level disadvantage. It is likely that poor health and well-being, as well as factors such as racism, food security, disconnection from culture and land, contribute to the remaining excess burden of obesity in this population (Thurber et al. 2018: 496). The authors conclude that socioeconomic and health behaviour factors are potential targets for promoting healthy BMI, but these must be considered within the context of upstream social and cultural factors.

In another study, Warin et al. (2019) emphasise that in situations ‘where food insecurity is a frequent occurrence, convenient foods and technologies work to ease hunger and fill stomachs and are enactments of care-giving and care-receiving’ (Warin et al. 2019: 19). They suggest that:

Obesity and convenience are intimately linked, as “industrialised nations are served with ever more convenient work, leisure and food-getting” (Ulijaszek 2007, 185). Popular and public health discourses frequently cite obesity as “the price of convenience” (Blanca, date unknown), placing particular emphasis on fast food consumption and the role of modern appliances in generational loss of cooking skills and production of obesity (Halkier 2017; Howard, Adams, and White 2012; Jackson et al. 2018). (Warin et al. 2019: 8)

Importantly, Warin et al. (2019: 1) explore the notion of “convenience as care”, which can in part be interpreted as the accessing of convenience foods as an expression of care—a concept of relevance to the remote Indigenous context and this study.

In the pursuit of an improved Indigenous diet and efforts to avert chronic diseases and obesity, physical exercise is often recommended. In one study, Macdonald et al. (2012) focused on women and girls living in remote rural communities where physical activity was discussed as a lifestyle “choice”, and three consistent themes emerged: shame, gendered positioning, and welfarism. The findings suggest that there are deeply embedded ways of thinking about the body, familial obligations, and the provision of and access to being active that are not consistent with Western health policies predicated upon individuals shouldering responsibility for “taking exercise”. See also (Gamlin 2013).

### Oral health

Access to dental care in Australia also has a strong socioeconomic dimension because the universal health-care system excludes dental care (Schwarz, 2006), cited in (Moore et al. 2015:25). This is exacerbated in remote communities where access to dental services is limited. As noted earlier there is 'substantial potential for health gain through reducing SSB intake by young Aboriginal and Torres Strait Islander children, particularly given the disproportionate burden of obesity *and* dental caries (Thurber et al. 2019: 2). Neuman et al. (2011: 367) conclude that data on the prevalence of early childhood caries (ECC) especially from pre-school-aged children in Australia are limited, with some reports suggesting that there is higher prevalence in more disadvantaged social economic groups, ethnic minorities and among populations residing in rural and non-fluoridated areas. Jamieson et al. (2007) concur, and state that:

- A higher percentage of Aboriginal and Torres Strait Islander children had experienced dental caries than other Australian children at all ages between 4 and 14 years.
- Aboriginal and Torres Strait Islander children most affected were those in socially disadvantaged groups and those living in rural/remote areas.
- Aboriginal and Torres Strait Islander children aged <5 years had almost one and a half times the rate of hospitalisation for dental care as other Australian children.
- The rate of Aboriginal and Torres Strait Islander children receiving hospital dental care increased with increasing geographic remoteness.
- Less than 5% of remote Aboriginal and Torres Strait Islander pre-school children brush their teeth on a regular basis. (Jamieson et al. 2007: vii)

In Australia, community-level initiatives have been employed as a means of improving the oral health of Aboriginal children living in remote communities:

A health promotion program focusing on the reduction of dental caries amongst children living in remote Aboriginal communities through fluoride varnish applications, training of primary care workers and individual, family and community- level health promotion did not produce any significant effects on oral health behaviours or clinical measures of oral health hygiene (Roberts-Thomson et al. 2010).

Despite no impact on oral health behaviour, with over 60% of parents reporting their child drank sugary drinks on the day of interview, the oral health promotion program by Roberts-Thomson et al. demonstrated significant reduction in dental caries with 3 tooth surfaces per child less decaying in the intervention group over the two year study period. Thus it appears that intensive oral health input can have an impact in the short term. (Slade et al. 2011).

Early childhood caries (ECC), a disease characterised by tooth decay in the primary teeth of children, has also become particularly burdensome in Aboriginal communities in Canada where the prevalence estimates of ECC range between 50% and 100%. Most concerning are the severe cases of ECC that require treatment with restorative surgery under general anesthesia. These surgeries often displace children and families from their local communities to specialty hospitals for treatment (Naidu et al. 2014). Pacey et al. (2010) consider that an Arctic nutrition transition, particularly the reduced intake of traditional food and an increased consumption of high-sugar foods, likely contributed to widespread ECC in Inuit communities (Pacey et al. 2010: 2). But also it is 'likely that the Arctic nutrition transition has been exacerbated by other oral health risk factors common in these regions, including the practice of giving bottles to children at bedtime, lack of fluoridated water, inadequate access to dental health care, and lack of education about preventative measures' (Pacey et al 2010: 3). Their research tallies with existing literature on the deleterious effects of acidic sugary drinks on dental health. The study also emphasised the likely importance of nutritional health education and better access to nutritious foods for promoting oral health.

A number of studies have been undertaken on diet and nutrition in the APY Lands (Balmer & Foster 1997; Bryce et al. 2020; Lee et al. 2016), see Also (Brimblecombe et al. 2013; Booth et al. 2023). The study by Lee et al. (2016) identified nutrition interventions on the APY Lands included both efforts to increase demand for healthy foods (including nutrition education and 'behavioural' approaches) and to improve food supply and food security. Lee et al. (2016: S81) found that poor diet accounts for more than 10% of the burden of disease in Australia and is now the leading single preventable risk factor, followed by obesity. Moreover, 'This is likely to be higher in Indigenous Australians, particularly the 26% living in remote areas who experience 40% of the health gap of Indigenous Australians overall'. The results of this study provide insights into broader nutrition issues affecting other Aboriginal communities and wider Australia, and reinforce the notion that public regulation and market intervention are required to improve diet and prevent obesity and NCDs. Bryce et al. (2020) found, improving children's intake of nutritious food is a complex matter:

Many historical, environmental, socioeconomic, and geographic factors contribute to the current diet of Aboriginal and Torres Strait Islander people. These include sustained economic disadvantage (low incomes and high rates of unemployment), limited educational opportunities, disruption to family structures, overcrowding, high food costs, and inadequate housing, and health hardware such as cooking equipment and food storage

facilities. Previous research with Aboriginal and Torres Strait Islander communities has found that food choice is affected by availability, affordability, traditional and individual preferences, familiarity, levels of food and nutrition literacy and cooking skills, and cultural factors, such as demand-sharing. (Bryce et al. 2020: 1-2)

Their study (2020:13) highlighted the strength of Anangu resourcefulness and resilience in securing household food intake in the face of poverty and adversity. In particular resilience to greater food insecurity was enabled by the culture of demand sharing (Bryce et al. 2020: 17).

## Political Factors

Young Indigenous children experience many health disparities, which can largely be attributed to the socio-economic, environmental, political and historical conditions in which they live. High quality, holistic and culturally relevant ECD and care programs provide a promising avenue for addressing these health disparities by optimizing Indigenous children's physical, emotional, psychological, cognitive and spiritual development, giving them the best start in life and ultimately addressing health disparities over the long-term (Halseth & Greenwood 2019: 7)

Public policy plays an important role in determining child health outcomes in Australia. Early childhood development (ECD) is a comprehensive approach to policies and programs for children from before birth to 8 years of age, their parents and caregivers. It is aimed at ensuring all children have an equal chance to thrive and grow. It encompasses the interrelated or holistic aspects of children's development, which includes the physical, social-emotional and language-cognitive domains (Wise 2013: 3). Indigenous ECD has become one of the strategic platforms for addressing Indigenous disadvantage in the National Indigenous Reform Agreement (Closing the Gap) with targets relating specifically to Early Childhood Development (ECD).<sup>26</sup>

Nonetheless, promoting healthy Indigenous early childhood development in Australia is complex. It requires multiple responses and multi-stakeholder interaction to promote physical, social-emotional and language-cognitive domains of development and to tackle the longstanding 'upstream' family and community challenges that contribute to disparities in early life outcomes (Wise 2013: 2). Public policy can play a role in protecting children from the promotional marketing of, for example, fatty and sugary foods. In fact, over 80% of Australian parents would like to see a ban on unhealthy food advertising to children (Morley et al. 2008) yet the power of the food industry prevents such a ban being considered possible

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<sup>26</sup> <https://ctgreport.niaa.gov.au/sites/default/files/pdf/closing-the-gap-report-2020.pdf>

(Swinburne 2019). Healthy public policy can also protect children from serious injuries sustained from motor vehicle accidents, such as child car restraint legislation in Australia (Reeve et al., 2007), cited in (Moore et al. 2015: 12). It is also suggested that improving public health policy associated with maternal health can assist in breaking the intergenerational cycle of chronic disease (Hoy & Nicol 2019a). See also (Chomat et al. 2014; Salmon et al. 2018).

### Early Childhood Development

Research has indicated that one way of reducing inequities during early childhood at the daily living conditions level is through the provision of high quality early childhood education and care (ECEC) (Moore et al. 2015: 47). Early Childhood Education and Care (ECEC) includes a range of formal and informal services related to health, wellbeing and education of children aged from birth to eight years and is terminology used by the OECD and UNESCO to refer to services for young children (Haddad 2002; OECD 2017).

Early childhood development (ECD) is aligned to, and complements, agendas and priorities for child health, pre-primary education, maternal and child health, quality early childhood care and education (ECCE) as well as child and family welfare, cited in (Wise 2013: 3). ECD programs and services include those which are beneficial for young children across physical, social-emotional and language-cognitive spheres of development. The key issues they address and the manner in which they are delivered are many and various. ECD programs and services include those that focus on children indirectly, through their support to parents and caregivers. These include parent education programs. ECD can also be delivered from other service platforms, such as health care services. Lack of access to, and participation in, ECD programs among Indigenous populations are a known risk for poor outcomes early in life ... Lack of co-ordinated focus in the delivery of services for the early years can lead to families and children 'falling through the cracks' (Moore & Skinner 2010). Cost (or perceived cost) and beliefs related to the non-parental care of young children also influence participation rates (Baxter & Hand 2013), cited in (Wise 2013: 8).

ECD requires a focus on the whole child including children's health and nutrition, social-emotional and language-cognitive development. The evidence comes from paediatrics, psychology, nutrition, child development and anthropology, which tells us that all areas of

growth and development are intimately related and mutually supported (UNICEF 2006).<sup>27</sup> Supporting healthy ECD means tackling the wider social determinants of health; that is, the ‘upstream’ family and community factors that contribute to disparities in early life outcomes (Wise 2013: 9). Innovative inter-sectoral, localised and place-based approaches to supporting ECD have been described in the literature.

### Inter-sectoral collaboration

Innovative models of inter-sectoral collaboration, including in ECD, have shown benefits for Indigenous peoples and communities, for instance increased satisfaction with services, improved coordination and reduced costs, and increased children’s school readiness (Halseth & Greenwood 2019: 35). As such, inter-sectoral collaborations must be context specific:

Successful intersectoral interventions in Indigenous child health are planned, designed and controlled by Indigenous communities to reflect their values and lived realities. They encompass Indigenous approaches to health and well-being, and aim to address the many determinants affecting Indigenous peoples’ health. They also incorporate Indigenous cultures, languages, values, and ways of knowing and learning (Public Policy Forum, 2015). (Halseth & Greenwood 2019: 6)

Ball (2014:12) states that strategic, integrated and intersectoral programming to improve timely, affordable access to supports for optimal early childhood development is achievable if there is political will to commit long-term investments and facilitate streamlining. Early childhood programs can become focal points in communities for the provision of a host of direct services, early identification and referrals in areas that are key contributors to outcomes, including early learning, parenting education and support, nutrition, prevention, early identification, primary health care, and clinical ancillary services for Aboriginal young children.

### Localised ECD

Localised ECD is one approach to providing ECD programs and services that reflects the diversity of conditions and needs found in Indigenous communities. ECD actions emerge in response to local context, culture, priorities, needs and strengths, and build on the core expertise and capacity of different organisations. Localised ECD emphasises Indigenous leadership in the ECD agenda and involvement in program delivery. The approach is

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<sup>27</sup> Childhood is a well-researched sub-discipline of Anthropology internationally (Allen et al. 2012; Bluebond-Langner & Korbin 2007; Levine and New 2008; Montgomery 2008; Richards & Light 1986), and in Australia (Eickelkamp 2010; Eickelkamp 2011b; Eickelkamp 2011a; Eickelkamp & Cowlshaw 2012; Robinson 2005; Robinson et al. 2008).

analogous to ‘community development’ (Higgins 2010: 6), ‘collective impact’ (Hanleybrown et al. 2012; Kania & Kramer 2011, 2013) and ‘community action’ social change approaches. Localised ECD is also aligned with interventions that address the social determinants of health (CSDH 2008), cited in (Wise 2013: 8). According to Wise (2013), localised early childhood development ‘works’ because it leads to interventions that:

- multiply effects through alignment of effort among partners;
- are tailored to address local determinants of early childhood development;
- take account of the realities of the local service delivery environment;
- have local legitimacy and credibility;
- take advantage of community strengths and abilities;
- integrate funding; and
- strengthen Indigenous capacity and empowerment. (Wise 2013: 2)

Moore et al. (2011) found, in their review of the evidence base in relation to early childhood approaches to support children in highly disadvantaged communities, that a successful approach:

- needs to promote wrap around, integrated services that are responsive to and driven by the community;
- focuses on how services are delivered rather than what is delivered. In order to implement the approach;
- needs a robust governance structure or entity capable of coordinating and supporting the many stakeholders and services involved must be established; and
- needs a long-term financial and policy commitment made.

They also identified ways of working effectively in a place-based way. The key features of a comprehensive place-based approach to services are as follows:

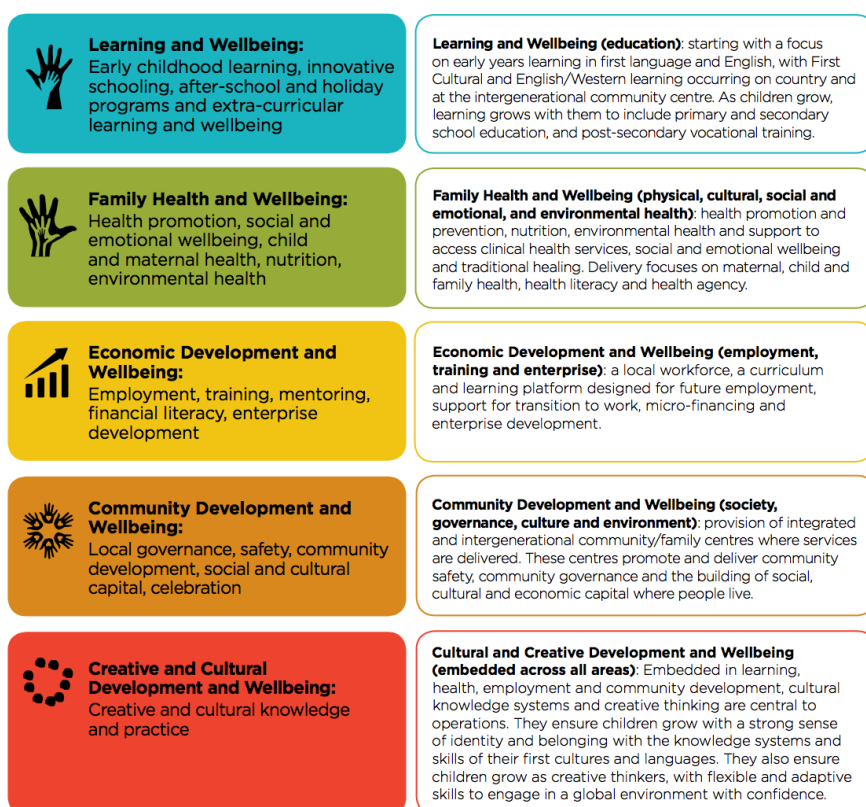
- Universal – based on the provision of a core set of services to all families in all localities.
- Tiered – provision of additional supports to families and areas identified as having additional needs and/or being exposed to multiple risks.
- Integrated – all relevant services work together to provide integrated holistic support to families.
- Multi-level – able to address all factors that directly or indirectly shape the development of young children and the functioning of their families.
- Place-based – integrated services planned and delivered in defined socio-geographic areas.
- Relational – based upon principles and practices of engagement and responsiveness, both at the individual and community level.
- Partnership-based – based on partnerships between families and service providers, between service providers, and between government and service providers.



- Governance structure – has a robust governance structure that allows different levels of government, different government departments, non-government services, and communities to collaborate in developing and implementing comprehensive place-based action plans.

(Moore et al. 2011: 18)

Examples of localised place-based Indigenous ECD service models in the NT include: Children and Family Centres (CFCs) at Yuendumu Maningrida, Gunbalanya, Ngukurr and Palmerston; and Children’s Ground in Alice Springs.<sup>28</sup> Building on what was identified in (Moore et al. 2011), the Children’s Ground Approach delivers services, referred to as the integrated ‘*Learning, Wellbeing and Development platform*’ (LWD platform). The LWD platform is a system that integrates five key areas of service, support and empowerment, as exemplified in the diagram below from Lorains & Vadiveloo (2019). The platform recognises that an early start in education, personalised education, health and wellbeing, safety, a healthy family and community environment, cultural identity and economic wellbeing are all critical foundations to a child doing well in life (Lorains & Vadiveloo 2019: 11).



The LWD platform, sourced from Lorains & Vadiveloo (2019)

<sup>28</sup> See Children’s Ground in Alice Springs, Northern Territory <http://www.childrensground.org.au/>

## Cultural Factors

Lastly, the cultural factors that contribute to the social determinants of health are addressed. Historically, little attention has been paid to the cultural contexts of child development and how these contexts influence developmental processes and outcomes (Fitzgerald & Farrell, 2012). In recent years, however, developmental scholars have recognised—and their research has demonstrated—that culture matters (Garcia Coll & Magnuson, 1999; Garcia Coll & Meyer, 1993; Rogoff, 2003), cited in (Sarche & Whitesell 2012: 42). Tumilowicz et al. (2016) state that a basic premise in designing and implementing effective interventions requires knowledge about the populations and communities—the context—in which interventions are situated, including knowledge from the perspectives of the people who are intended to benefit from the behaviour changes that are being promoted (Tumilowicz et al. 2016: 55).

Differences in world views and criteria for what constitutes knowledge do not require researchers to abandon rigorous science (Spicer et al., 2012), but they do mean that the pathway to knowledge in tribal communities requires tribal communities to be equal participants in coconstructing research so that it is guided as much by tribal perspectives as it is by Western science perspectives and majority culture values (Fisher & Ball, 2002). Only by being actively involved in all facets of research or program evaluations can tribal capacity for sustainability be addressed (Mitchell & Baker, 2005). In the final analysis, culturally appropriate prevention–intervention programs developed through this approach are more likely to meet community needs, produce positive child outcomes, and be sustained by tribal communities. (Fitzgerald & Farrell 2012: 77)

## Cultural norms: family attitudes, perceptions and behaviours

Parental attitudes and behaviours are in part shaped by cultural background (Agboado et al., 2010; Cowley-Malcolm et al., 2009; Gallegos et al., 2013; Griffiths et al., 2005; Prady et al., 2014; Raleigh et al., 2010) ... Cultural background can also impact upon how parents interact with medical professionals who treat their children (e.g. level of engagement, active seeking of information) (Cox et al., 2012). Cultural groups may have different behaviours regarding health and health services in different national contexts, cited in (Moore et al. 2015:32). However, few studies provide evidence to support the claim that interventions targeting parent knowledge also lead to *actual behaviour change* for either parents or children (Moran et al., 2004). In some cases parental knowledge of a specific risk factor to children does not impact upon parent behavior, cited in (Moore et al. 2015: 29), For instance, social norms and parents' beliefs regarding the general social acceptability of issues pertaining to children (e.g. children's eating habits) can influence their attitudes (Lally et al., 2012), cited in (Moore et al. 2015: 31).

In one Australian study, McDonald et al. (2009) found that Indigenous childcare practices had remained relatively unchanged over the past 30 - 40 years. They noted that the tradition of sharing responsibility for the day-to-day care of young children, and the degree of freedom very young children have in determining their own care, enables them to reject any hygiene training attempted by their carers. Additionally, few carers were appropriately skilled to ensure children comply with their wishes. Lastly, children were frequently taking responsibility for the hygiene needs of infants and toddlers but there were few positive role models for them to emulate. The study exposed childcare practices related to children's hygiene that if not addressed are likely to limit the success of any future hygiene improvement programs. Importantly, parent behavior also impacts upon children's dietary intake:

Improving nutrition and health in individuals and populations depends ultimately on voluntary behavior change in an environment that does not prohibit the potential for change. For nutrition, the undisputed environmental barriers to behavioural change include lack of availability and access to food, lack of technological means to transform potentially edible food into food that can be consumed and physiological conditions that prevent individuals from consuming foods or utilizing the nutrients that they contain. Outside of these broad parameters are sets of social, economic, ecological, agricultural, cultural and psychological determinants that facilitate or impede the potential for people to adopt behaviours that lead to better nutrition. Interventions to improve nutrition are directed at one or more of these sets of determinants. (Tumilowicz et al. 2016: 55)

There is some evidence to indicate that parental diet-control practices (e.g. controlling snack intake), family attitudes towards food and the quality of young children's diets are related to sociodemographic factors such as parent age, maternal education levels, ethnic background and community-level disadvantage (Brown et al., 2008; Clark et al., 2008; Green et al., 2003; Northstone & Emmett, 2005, 2013; Rogers & Emmett, 2003; Santorelli et al., 2014; Saxton et al., 2009) ... The intergenerational transmission of values within families also impact upon children's eating habits and parents' behaviours regarding their children's eating habits (Green et al., 2003; Roden, 2003). It is not only how parents behave in regard to their children's diet, but also their own dietary practices that impact upon their children's health. Maternal consumption of fruit, vegetables and 'non-core' foods appear to have an especially significant impact upon young children's eating habits (Khanam et al., 2009; McGowan et al., 2012) and parental consumption of fruit and vegetables is associated with their children's intake of both (Cooke et al., 2004; Wyse et al., 2011), cited in (Moore et al. 2015: 32).

In a study in a non-Indigenous community in SA, Warin (2018) examines the relationship between obesity, knowledge and education, stating that in public health circles

and public understandings it is commonly assumed that obesity is the result of lack of knowledge about the right things to eat or how to take care of oneself. While it is commonly thought that education will fill this knowledge lacunae and most public health campaigns have education as the main platform of information dissemination to enact behavioural change, Warin counters these assumptions:

In looking to unpack the concept of education in healthy eating programs, I use the work of Ingold (1999, 2013) to critique the assumptions inherent in the particular type of education used in health pro- motion. In doing so I examine an alternative model of education that is informed by a locally based peer-to-peer program (Family by Family) and is based on embodied skill rather than cognition. This program radically reformulates the values of education and knowledge from one of information transmission from expert to novice, to education as skill and shared social practice. In many ways this program resonates with anthropological approaches to cultural reproduction (Sutton 2009); understanding the ways in which learning and the transmission of skills and knowledge work in communities of practice and are laden with complex power dynamics (Haase 2006; Shove et al. 2012). In terms of learning about food, eating and cooking, attention is attuned to bodies, their techniques and sensory engagements, and how embodied habits (as opposed to traditional Western models of explicit instruction) are key to the ways in which people come to know what they do (Sutton 2009: 64). In conclusion, I argue that positioning education in the context of everyday spaces, relationships and social practices has the potential to place skill as a key component of knowledge, rather than understanding information as the primary transmission of knowledge. (Warin 2018: 110)

In her exploration of the limits of mainstream nutrition education, Warin (2018) concludes that constructing people as having deficit knowledge has the unwarranted effect of implying ignorance. Following on from this, Simmons (2011) states that having an ‘awareness of local explanatory models is an important first step in developing culturally sensitive health promotion and education training programs’ (Simmons 2011: 478). Accordingly, health promotion interventions could benefit from highlighting areas of convergence of both indigenous and biomedical understandings of the disease, particularly for developing content that can be more readily assimilated and understood (Simmons 2011: 482). As is discussed below, documenting and understanding such local explanatory models can be gained through ethnography.

For example, in a Canadian study of immigrant women’s food choices in pregnancy, social support emerged as one of the strongest predictors of food consumption and adherence to personal and traditional practices (Higginbottom et al. 2018: 533). The study found that, although ‘cultural traditions and dietary choices persisted despite acculturation and adaptation, some of the women nevertheless rejected or altered practices because of

changing social, cultural, and economic contexts' (Higginbottom et al. 2011: 535). The findings also reaffirmed the notion that immigrant women bring with them culturally determined health beliefs that heavily influence their perinatal food choices and behaviors and these beliefs may or may not concur with Canadian food guidance in pregnancy (Higginbottom et al. 2011: 535). This alerts us to the overriding presence and strength of traditional practices in determining food choices in remote Indigenous locations as well. Finally, they conclude that further research is needed to elicit better understandings of ethnocultural food choices and practices and to improve culturally based competency in maternity care (Higginbottom et al. 2018: 536).

Brady in her study of tobacco use in Indigenous Australia asserts that dealing successfully with smoking cessation would be enhanced by an understanding of the long-standing historical, social and cultural antecedents to present-day usage of tobacco (Brady 2002). Elsewhere (Gould et al. 2013), it has been concluded that pregnant Aboriginal and Torres Strait Islander smokers require comprehensive approaches, which consider the environmental context, increase knowledge of smoking harms and cessation methods, and provide culturally targeted support. Long term, broad strategies should de-normalize smoking in Aboriginal and Torres Strait Islander communities. Further research needs to examine causes of resistance to anti-tobacco messages, clarify contributing roles of stress and depression, and attitudes to pharmacotherapy.

### [An ethnographic approach](#)

Chenhall & Senior (2017: 177) state that although various government policies have implemented significant programs aimed at improving the social determinants of Indigenous health in remote Indigenous communities in Australia, the lack of significant health improvements has led them to believe that we need to understand the local context and experiences associated with these programs in new ways. Only recently has anthropology, and ethnographic methodology, been recognised as valuable tools for health care disciplines.

Direct anthropological engagement with the social determinants framework remains limited in Australia, but authors such as Burbank (2011)<sup>29</sup> emphasize that understanding the links between health and social factors requires detailed community-based research and attention to individual circumstances, experiences, and aspirations as well as an

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<sup>29</sup> Burbank's (2011) 'ethnography of stress' in one remote Australian Aboriginal community used ethnography to describe the 'complex and dynamic links' between the social determinants of health, history, place, and health (Burbank 2011).

understanding of how individuals interact with the various services available to them and the barriers that arise. (Chenhall & Senior 2017: 191)

Ethnographic investigators in the socio-cultural anthropology subfield of applied anthropology (or applied ethnography) (Pelto 2013) have examined and drawn attention to the mismatch between the ways in which nutrition and health interventions are delivered and how they are perceived and utilized by beneficiaries (Tumilowicz et al. 2016: 59). Ethnography also grasps both the patterns of belief and experience in communities and individual divergence from them, as well as how these may be subtly or dramatically altered by changing circumstances' (Chenhall & Senior 2017: 193).

One element of ethnographic practice is participant observation—simultaneously immersing oneself in a culture and also removing oneself from that immersion to intellectualize what one has seen and heard (Bernard, 2002: 324). The goal of participant observation is to move from an etic (objective, outsider's) perspective to an emic (subjective, insider's) perspective—that is, seeing and understanding the culture from the perspective of the people themselves (e.g. local explanatory models for a given phenomenon) (Simmons 2011: 477), see also (Wakani et al. 2013). As Tumilowicz et al. (2016: 56) state 'designing, implementing and evaluating interventions requires knowledge about the populations and communities in which interventions are situated, including knowledge from the 'emic' (insider's) perspective'. Moreover, obtaining 'emic perspectives and analysing them in relation to cultural, economic and structural features of social organisation in societies is a central purpose of ethnography' (Tumilowicz et al. 2016: 56), see also: (Chary et al. 2013).

Chenhall & Senior (2017) offer an ethnographic perspective on the lived experiences of the social determinants in a remote Indigenous community in northern Australia. As participant observers, ethnographic research helps them recognize how complex information about the lived experiences of health and well-being are assembled (Chenhall & Senior 2017: 193):

As anthropologists seeking to understand human experiences through ethnographic research, the notion of assemblage offers a new way to understand the lived experience of health in social contexts, about how individuals interact with the material, psychic, social, and abstract worlds. (Chenhall & Senior 2017: 179)

They go on to say that 'the notion of assemblage is useful in its ability to grasp a world that is less amenable to the epidemiological diagrams presented in various social determinants models'. An example of what they mean is made clear in their focus on sugar and soft drinks:

‘The impossibility of reading cause–effect relationships between soft drinks and public health messages focusing on changing social determinants that enabled/encouraged consumption of soft drinks was made visible when we delved deeper into the ethnography of sentiments and behaviors around soft drinks’ (Chenhall & Senior 2017: 184):

By following the soft drink to its social entanglements and specific meanings in different contexts, different assemblages that contained soft drinks become visible. An individual’s choice to consume a soft drink should be considered within what emerged as a complex assemblage of material conditions, family relationships, feelings, and ideas. (Chenhall & Senior 2017: 185)

They also apply this method to thinking about housing and other social determinants of health in a remote community context, and they consider that,

Ethnographic forms of evidence point to nonlinear relationships between people, feelings, events, and things associated with health outcomes that are sometimes unexpected and sometimes surprising, but certainly seldom determined. The territorialized health assemblages we have presented in this article as an alternative way to construct relationships between people, objects, and broader structures have emphasized the transformations that occur in these relationships through their interaction. In many ways, this approach helps us explain the failure of previous social determinant interventions. (Chenhall & Senior 2017: 191)

Ethnography is also an essential aspect of implementation research in nutrition, as it provides important insights for making decisions about appropriate interventions and delivery platforms; determining how best to fit aspects of programme design and implementation into different environmental and cultural contexts; opening the ‘black box’ in interventions to understand how delivery and utilisation processes affect programme outcomes or impacts; and understanding how programme impacts were achieved, or not (Tumilowicz et al. 2016: 56). Warin (2018), for example, undertook extensive ethnographic fieldwork to understand food consumption patterns:

... participant observation in family homes, community spaces, shopping centres, food markets and malls, public parks; community cooking, nutrition and exercise classes; and participation in a people’s lives (eating and cooking with them, going shopping, gardening, exercising and on one occasion, dumpster diving). In addition, 40 families were involved in semi-structured interviews where they were asked about their eating habits and practices (and how this changes according to the doing of different events). Two focus groups were also conducted, where changes to food and eating across biographical time in relation to changing food stories and life course was recorded. (Warin 2018: 111)

Sensory ethnography is also being used as a methodology to develop deeper understandings of place and health generally. Sensory ethnographers seek to identify what it “feels” like— including sensory, emotional, and intellectual experiences—to inhabit certain spaces, places,

and events from the insider's perspective. Hence, sensory ethnography allows researchers and local residents to reach beyond what is usually observed and measured to identify more subtle and invisible experiences that shape health and wellbeing (Sunderland et al 2012: 1056). Sunderland et al (2012) use sensory ethnography to study the daily lived experience of the social determinants of health in place:

Sensory ethnography is an expansive option for SDOH research because it encourages participating researchers and residents to "turn up" their senses to identify how previously ignored or "invisible" sensory experiences shape local health and wellbeing. Sensory ethnography creates a richer and deeper understanding of the relationships between place and health than existing research methods that focus on things that are more readily observable or quantifiable. (Sunderland et al. 2012)

Likewise, focused ethnography is also being used in health research. Some applied medical anthropologists, for example, use ethnography in conjunction with rapid assessment methods—an approach known as focused ethnographic study (FES)—created for the World Health Organization to study acute respiratory illness (ARI) in children (Simmons 2011: 478). See also (Kozlov et al. 2007). Focused ethnographies are also increasingly implemented in nursing research as a way of adapting nursing practice to a community's beliefs and social context (Cruz & Higginbottom, 2013; Roper & Shapira, 2000), cited in (Thorne et al. 2016: 28).

Where classical ethnography seeks to understand an entire cultural group through extensive fieldwork, focused ethnographies use many of the same data collection methods over a shorter time period, with a more focused topic of investigation (Polit & Beck, 2008; Speziale & Carpenter, 2007), cited in (Thorne et al. 2016: 28). While conventional ethnographies emphasize long-term fieldwork and prolonged participant observation, focused ethnographies include intense data collection and data analysis, less time spent in the field and occasional participant observation (Rashid et al. 2015: 9). Focused ethnography aims describe a specific issue within a defined cultural subgroup. This research approach seeks to increase understanding of "emic" or cultural insider's view of the phenomena studied, exemplified in an investigation of the historical and traditional infant feeding practices of the Ojibwe in Northern Minnesota (Dodgson & Struthers 2003), see also (Dykes & Flacking 2016). Furthermore, a focused ethnographic approach was used to examine knowledge, behaviour and attitudes related to treatment-seeking behaviour and traditional medicine was conducted in the Nasioi area of Bougainville (Macfarlane 2008) where people attributed illness to both biological factors and supernatural forces, see also: (Price & Hawkins



2002; Zoucha et al. 2015). In another example, focused ethnography was used to explore oral health beliefs and practices, and factors related to child oral health promotion with community members in the Algonquin community of Rapid Lake, Quebec. Three main themes emerged from the analysis: (1) a gap existed between oral health knowledge and oral health behaviors; (2) challenges for oral health promotion included attitudes and beliefs, access, and priorities; and (3) parents needed to be further integrated into health promotion strategies (Naidu et al. 2014).

Finally, focused ethnography was used to look at influential life experiences and environmental contexts associated with pregnancy among “out-of-home” pregnant adolescent women in Seattle, USA were explored:

This descriptive analysis was part of a prospective, ethnographic exploration of the beliefs and meanings of pregnancy and motherhood, as well as the contexts in which those meanings are negotiated, among out-of-home pregnant adolescents in Seattle. This article focuses on the contexts, life experiences, and day-to-day environments the adolescents identified as influencing their out-of-home status and pregnancy decisions. (Saewyc 2003: 347)

Additionally, Moore et al. (2015: 73) also suggest that longitudinal studies are also most likely to reveal links between prenatal/early childhood experiences and later health behaviours and outcomes.

## Implications for Ngaanyatjarra child health research project

Society and the social and cultural environments in which children are reared have changed dramatically around the globe over recent decades. In particular, Indigenous populations worldwide are experiencing social, cultural, demographic, nutritional, and psychoemotional changes that have a profound impact on health (Valeggia & Snodgrass 2015). Such changes in family conditions matter because of the overwhelming evidence that social factors have profound influences on health (Halfon et al. 2010). Children are particularly sensitive to social determinants, especially in the early years (Moore et al. 2015: 7). Nowhere is this more apparent than in remote Indigenous communities in Australia.

Earlier it was asserted that health is related to ‘an individual’s environment and circumstances such as where they live, their education level, income and living conditions along with their access to and use of health services (WHO 2017)’, but for ...

... Aboriginal and Torres Strait Islander people, factors such as cultural identity, family and kinship, country and caring for country, knowledge and beliefs, language and participation in cultural activities and access to traditional lands are also key determinants of health and wellbeing (AIHW and NIAA 2020). These factors are interrelated and combine to affect the health of individuals and broader communities.<sup>30</sup>

Aboriginal and Torres Strait Islander cultural identity and participation in cultural activities, access to traditional lands along with connection to family and kinship, are recognised as protective factors and can positively influence overall health and wellbeing (AIHW 2017). For example, ABS survey data show that Indigenous Australians who lived on their homelands or traditional Country were more likely to assess their own health as excellent/very good/good (78%) than those who were not allowed to visit their homelands or traditional Country (47%) (ABS 2019).<sup>31</sup>

A study by Fatima et al. (2020) shows that Indigenous children with strong cultural identity and knowledge are less likely to experience social and emotional problems than their counterparts. Findings from an Australian Institute of Family Studies report (2023) indicate that 'Aboriginal kinship relations reflect a complex and dynamic system that is not captured by existing non-Indigenous definitions of family'. They state that the 'strengths of Aboriginal cultural traditions, as they apply to family life and raising children, revolve around four interrelated themes: 1. A collective community focus on child rearing helps children; 2. Children need the freedom to explore and experience the world; 3. Elderly family members are important to family; and 4. Spirituality helps families cope with challenges.'<sup>32</sup>

Almost no research in the Ngaanyatjarra regions has addressed changing child-rearing practices, contemporary living conditions and the implications for child health from a social determinants perspective. Exceptions include Catherine Holmes study of the everyday practices of Ngaanyatjarra and Pintupi children and how they have altered since pre-contact times (Holmes 2023), Donna Simmonds study of maternal health (Simmonds 2002; Simmonds et al. 2012), Gillian Shaw's ethnographic study of child-rearing in the Ngaanyatjarra Lands (Shaw 2002), anthropological studies by David Brooks (Brooks 2011; Brooks & Shaw 2003)

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<sup>30</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023

<sup>31</sup> Australian Institute of Health and Welfare. (2022, June). Determinants of health for Indigenous Australians. Canberra, ACT, Australia. <https://www.aihw.gov.au/reports/australias-health/social-determinants-and-indigenous-health> Accessed 26 October 2023

<sup>32</sup> Australian Government. (2023). Strengths of Australian Aboriginal cultural practices in family life and child rearing. Australian Institute of Family Studies: <https://aifs.gov.au/resources/policy-and-practice-papers/strengths-australian-aboriginal-cultural-practices-family-life#this> Accessed: 26 October 2023.

and Inge Kral and Elizabeth Ellis' studies (Kral & Ellis 2008; Kral & Ellis 2020) of intergenerational change and child socialisation, see also (Scougall 2005).

The reviewed literature above clearly identifies a lacuna in the knowledge in this region that would inform health practitioners seeking to answer these research questions:

*What are the social, cultural, environmental and economic factors affecting child health in in the Ngaanyatjarra Lands remote Aboriginal communities?*

*What are the implications for improving child health outcomes in the Ngaanyatjarra region?*

It is well-known that families in the Ngaanyatjarra Lands have been affected by the profound social changes that have occurred in the region since the mid-1930s (Kral 2012;Kral & Ellis 2020). Some of the significant transitions include: the shift from mobility as the norm (with temporary camps and alternating small group and large group interaction) to relatively sedentary residence patterns in houses in permanent communities; altered food consumption practices; and changing birthing and childrearing practices.

It is assumed that many 'traditional' cultural attitudes, perceptions and behaviours remain and impact positively and negatively on contemporary life and the health and well-being of children. However little research has been undertaken regarding the 'nutrition transition' and the impacts on child health. Some of these elements may include:

- Patterns of starvation in nomadic desert life that may impact on feast or famine food consumption and spending patterns today.
- The role of traditional healers, and beliefs that ailments and strange events can be linked to sorcery and the supernatural.
- The smoking of newborn babies. Performed in the past because Ngaanyatjarra people believe that the healing quality of smoke has the power to make the baby grow up to be *tjaa nyantulypa* (healthy, obedient and respectful) as an adult.
- An expectation of extended family care, evidence in the kinship network and practice of *yurrtjunu* where children and adolescents were given into the care of extended family members for long periods of time.

These factors, and more, impact on Ngaanyatjarra childrearing practices today.<sup>33</sup> However

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<sup>33</sup> See also (Kruske et al. 2012; Priest et al. 2008).

the implications for child health urgently needs more investigation. Shaw (2002: 85-87) in her study found that Ngaanyatjarra child rearing has changed very little since pre-contact times:

- New developments such as money have been incorporated into child rearing, for example the use of money and the extent to which small children feed themselves from the store. Thus fulfilling a culturally held ambition of autonomy.
- It is likely that parents themselves are not aware of what constitutes what contemporary nutrition science describes as a healthy diet.
- Parents do not see it as their role to tell a child what to eat.
- Children have a great deal of control over what they eat.
- Ngaanyatjarra child rearing is based on the belief that a child knows what is good for them, for example it is very difficult for a mother to insist that a child swallow the medicine. She is likely to interpret a child's refusal to take the medicine as the child not needing it, and will therefore not insist that they take it.

Shaw concludes that it,

... is highly unlikely that any strategy introduced by health professionals will produce cultural change of the type that hasn't occurred in the last seventy years. For example attempts to encourage mothers to supervise their children more closely are doomed to failure, because they contradict a basic cultural principle of autonomy – and that principle and the practices that flow from it are unlikely to change. Therefore any health problem (such as injury to children) needs to be examined from a different perspective ... Thus it is important to know the cultural roots of any given child rearing practice before one attempts to intervene, as the origins and histories of these practices will provide an indication of what strategies may and may not be successful. (Shaw 2002: 86)

Clearly identifying here, the need for more ethnographic research in the domain of child health in the Ngaanyatjarra region.

## Summary of key points

- 1. Early childhood has a major role in shaping health in later life. Indigenous children living in remote and very remote communities in Australia experience a significantly higher burden of disease compared to urban, and non-Indigenous peers:**
  - High rates of perinatal risk factors, childhood infectious diseases, environmental risk factors and reduced access to healthcare combine to provide an environment within which Aboriginal children struggle to thrive.
  - Downstream this leads to social, economic and health disadvantages which in turn perpetuate the cycle.
  - A broader and multifactorial approach is needed to achieve best outcomes for remote Aboriginal communities.
- 2. Cumulatively these health factors impact on children's growth, and on their wellbeing, cognitive development and educational outcomes. Leading ultimately to a greater likelihood of developing chronic disease in adulthood and to social disadvantage throughout life:**
  - Indigenous infants in Australia are more likely to be still-born, have low birthweight and suffer from anaemia and malnutrition than non-Indigenous children.
  - Indigenous children are more likely than non-Indigenous children to suffer from health conditions such as acute rheumatic fever, pyoderma, skin infections, trachoma or impaired hearing and dental caries.
- 3. There are three layers of influence that lead to inequitable, socially produced, systematic differential health and wellbeing outcomes:**
  - The socioeconomic, political and cultural context, encompassing governance, policy, and dominant cultural and societal norms and values;
  - The daily living conditions, which are the circumstances in which people are born, grow, live, work and age; and
  - The individual health-related factors, that is, the health-related knowledge, attitudes and behaviours of individuals that result from, and are responses to, their socioeconomic, political and cultural context, social position and daily living conditions.
- 4. The social determinants of health are the 'conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life' (WHO 2017):**
  - Aboriginal health and welfare policy has not recognised the social determinants that shape individual and group health and hygiene behaviour.
  - Children are particularly sensitive to social determinants, especially in the early years when a number of capabilities and competencies develop.

5. **Supporting healthy early childhood development means tackling the wider social determinants of health; that is, the 'upstream' family and community factors that contribute to disparities in early life outcomes.**
6. **Indigenous children are in greater danger developmentally, owing to risk factors originating within the family environment, the community where the child grows up, and the type of early childhood development factors they are exposed to. Specific risk factors include:**
  - Smoking and drinking during pregnancy.
  - Poor health and nutrition during pregnancy.
  - High rates of STIs as a predictor of premature birth and low birth-weight.
  - Disadvantaged socio-economic conditions.
  - The adoption different dietary habits across the generations (including the consumption of sugar-sweetened soft drinks, and snack foods high in fat, sugar and salt associated with obesity, dental caries, anaemia, lowered resistance to infection and diabetes).
  - Insufficient availability and effectiveness of early childhood development programs and services.
7. **A variety of interacting and interdependent experiences and environmental conditions are responsible for development in early childhood:**
  - Efforts to improve Aboriginal children's health have mostly focused on the treatment or eradication of diseases by the use of vaccines and improved medical case management, or ongoing heavy reliance on health education methods and approaches that might be considered coercive or to cause embarrassment by singling out individuals, families or households.
  - A combination of overcrowding, non-functioning essential housing infrastructure, and poor standards of personal and domestic hygiene underlie the high burden of infection experienced by children, as well as disability during childhood and early adulthood.
  - Governments are placing most reliance upon evidence-based programs that address the presenting problems rather than looking at the systemic (ecological) conditions.
8. **There is a need to address policy and the management of the living environment and housing infrastructure, as well as key parenting and childcare practices that impact on child health outcomes in remote communities.**
9. **Many of the factors contributing to the problems associated with living conditions and hygiene in remote communities are outside the control of the health system. An intersectoral approach and multifaceted interventions are needed in the area of early childhood education and care.**

**10. Little attention has been paid to the cultural contexts of child development and how these contexts influence developmental processes and outcomes.**

- Parental attitudes and behaviours are in part shaped by cultural background.
- Traditional practices in determining food choices have an overriding presence in remote Indigenous locations
- The intergenerational transmission of values within families impacting upon children's eating habits and parents' behaviours regarding their children's eating habits.
- Social norms and parents' beliefs regarding the general social acceptability of issues pertaining to children (e.g. children's eating habits) can influence their attitudes.
- The degree of freedom very young children have in determining their own care, or the care of younger siblings, enables them to reject any hygiene training attempted by their carers.
- Obesity and convenience are intimately linked - convenience as care can in part be interpreted as the accessing of convenience foods as an expression of care.

**11. Having an awareness of local explanatory models is an important first step in developing culturally sensitive health promotion and education training programs:**

- Constructing people as having deficit knowledge has the unwarranted effect of implying ignorance.
- Whereas, positioning education in the context of everyday spaces, relationships and social practices has the potential to place skill as a key component of knowledge, rather than understanding information as the primary transmission of knowledge.
- Designing, implementing and evaluating interventions requires knowledge about the populations and communities in which interventions are situated, including knowledge from the insider's perspective.

**12. Almost no research in the Ngaanyatjarra region has addressed changing child-rearing practices, contemporary living conditions and the implications for child health from a social determinants perspective. Clear baseline health and social determinants of health data for the Ngaanyatjarra Lands and an analysis of trends within the context of recent programs and policy changes will allow communities to establish their own targeted community led interventions and advocacy to best address their unique health profile.**

## Appendix 1.

### Aims of the proposed Ngaanyatjarra Child Health Study

To provide a descriptive, situational analysis of child health and contributing factors and explore associated community, program and policy factors over the last 10 years:

- Identify rates of social (e.g. incarceration, domestic violence, household income) and environmental (health related house hardware, overcrowding, smoking) health determinants.
- Identify prevalence of perinatal (birthweight, gestation, maternal health) risk factors.
- Identify prevalence and incidence of childhood infectious presentations by age.
- Identify markers of nutrition status of anaemia and growth faltering by age.
- Identify number and type of childhood antibiotic prescriptions by age.
- Identify number and type of childhood hospitalisations by age.
- Describe of social policy changes.
- Describe the understanding of child growth and health from the community's understandings and perceptions and including clinical staff perceptions.
- Identify targets for community led solutions and ongoing monitoring and evaluation
- Design of culturally appropriate assessment tools for identifying early childhood milestones.
- Identify social and cultural factors that have an effect on behaviour change and health interventions.
- Compare community and clinical markers pre- and post-CDP reforms
  - Comparison of community and clinical markers pre- and post-change of control in Rental – housing repairs structure
  - Qualitative component
- Describe understanding child growth from the community's understandings and perceptions, including clinical staff perceptions - conducted in 3 communities.
- Identify services accessed for health/food; transport in and outside of communities.
- Investigate intersectoral collaborations between existing ECE services, schools, health services and housing services.
- Explore the delivery of an effective place-based, intersectoral ECD system in the Ngaanyatjarra Lands.

Existing examples of ECD initiatives in the Ngaanyatjarra region include:

- NHS primary care services including, a Sexual Health Program, Child Health Program, Maternal & Women's Health Program.
- NPYWC range of programs that support child and family wellbeing like the Child Nutrition and *Walytjapiti* (Intensive Family Support) programs.
- *Tjilku Kurlunyku Centre* (Early Learning Centre) built by the Ngaanyatjarraku Shire in Warburton, and extended to Blackstone and Jameson communities.

These will also be investigated for potential intersectoral collaborations.



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