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Intergenerational influences of hunger and community violence on the Aboriginal people of Western Australia: A review

Authors

Francesca Robertson

David Coall

Dan McAullay

Alison Nannup

About the authors

Dr Francesca Robertson is a Senior Research Officer at the Kurongkurl Katitjin Centre for Indigenous Australian Education and Research, Edith Cowan University, Perth, Western Australia.

Dr David Coall is a Senior Lecturer in Biomedical Science at the School of Medical and Health Sciences, Edith Cowan University, and Adjunct Research Fellow, School of Psychiatry and Clinical Neurosciences, University of Western Australia, Perth, Western Australia.

Dr Dan McAullay is a Principal Research Fellow at the Centre for Improving Health Services for Aboriginal Children, Princess Margaret Hospital and University of Western Australia, Perth, Western Australia.

Alison Nannup is a Research Officer at the Kurongkurl Katitjin Centre for Indigenous Australian Education and Research, Edith Cowan University, Perth, Western Australia.

Abstract

There is a consensus in the literature that hunger and community violence inaugurates adverse health impacts for survivors and for their descendants. The studied cohorts do not include Western Australian Aboriginal people, although many experienced violence and famine conditions as late as the 1970s. This article describes the pathways and intergenerational impacts of studied cohorts and applies these to the contemporary Western Australian context. The authors found that the intergenerational impacts, compounded by linguistic trauma, may be a contributor to current health issues experienced by Aboriginal people, but these are also contributing to the resurgence in population numbers.

Keywords

Aboriginal health, intergenerational impact, linguistic trauma, environment

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Introduction

It is now understood that severe physical and social stress such as that incurred by famine and community violence can have an adverse impact on the health and well-being of survivors and on their descendants (Cunliffe, 2016; Heijmans et al., 2008; Imam & Ismail, 2017). For example, studies on the health and well-being of descendants of survivors of famines in a context of violent repression by an occupying force, *An Gorta Mór* (the Great Hunger) between 1845 and 1852 in Ireland, and *De Hongerwinter* (The Hunger Winter) in Holland in 1944–45, show how both groups share a similar legacy, having elevated rates of heart disease, type 2 diabetes and mental illness (Lumey et al., 2007; Walsh, 2018). Some pathways—mechanisms that express adverse experiences in one generation to the second and third generations—have been identified (Coall, Tickner, McAllister, & Sheppard, 2016; Kuzawa, 2005; Soubry, 2015). In this article, the authors first explore whether the research concerning pathways can be applied to Aboriginal people in the context of an earlier and very significant stress, the 10,000-year drought between 25,000 and 15,000 years ago, which was associated with the Last Glacial Maximum. The authors also explore whether the descendants of Aboriginal people in Western Australia who experienced violence, famine and subfamine conditions on stations, farms, settlements and missions during the occupation also share a similar legacy to Irish and Dutch descendants of famines. In exploring this, the authors identify another pathway, linguistic trauma, specific to those cohorts whose language was repressed.

This paper is exploratory, asking questions and exploring potential explanations by reviewing connecting research from a number of disciplines, including evolutionary biology, genetics, epidemiology, history and psychology. It is intended to be a starting point for discussion. The first question, however, is why are we thinking about this now? This can be answered definitively: Studies on descendants of *An Gorta Mór* and *De Hongerwinter* were possible because the famines were defined in a particular time and location and the affected populations lived in a countries that kept records that could subsequently be explored. Records were not kept about Aboriginal people in Australia until after the 1967 referendum. Prior to that time, the question about Aboriginal status on the Census was used to exclude them from official population statistics. This was a requirement of the Constitution—between Federation in 1901 and 1967, the *Commonwealth Constitution Act*, Section 127 stated that “in reckoning the numbers of the people of the Commonwealth …, aboriginal natives shall not be counted”. Since 1967 Aboriginal people have been counted both as a defined cohort and as members of the Australian community.

Post-famine cohorts

An Gorta Mór

There is a consensus in the historical literature that under the auspices of the *Act of Union 1801,* which created the United Kingdom of Great Britain, the Irish Parliament was dissolved and Ireland was effectively occupied by Protestant Irish and/or British landlords. Irish commerce and industry were deliberately destroyed, commerce was conducted in English, and speaking Gaelic became synonymous with poverty (T. Crowley, 2017). These and other factors led to one-third of the population becoming dependent on the potato as a single subsistence crop, so that when a potato blight ravaged crops throughout Europe, between 1845 and 1852, those who subsisted on it starved. During the famines, Ireland lost between a fifth and a quarter of its population to death or diaspora (J. Crowley,

Murphy, & Smith, 2012) Throughout the famine years, landlords in Ireland continued to export food to Britain (Ross, 2002).

De Hongerwinter

During World War II (1939–1945) in the Netherlands, food was diverted to the Nazi occupation force and to Germany, leaving little for the Dutch. In the Winter of 1944–45, which was particularly severe, the Nazi regime imposed a blockade, leading to *De Hongerwinter.* This was particularly severe in the densely populated western provinces (Hitchcock, 2009). Approximately 4.5 million people were affected and survived because of soup kitchens, but between 15,000 and 22,000 died (Hart, 1993).

Aboriginal people in Western Australia

Europeans began occupying Western Australia (WA) after 1826. There is a consensus in the historical and autobiographical literature that when a settler took over an area of land, it was expected that the Aboriginal people on that land were part of the property deal (Arnold, 2015; Host & Owen, 2009, p. 132). They were positioned as slaves who could be used at will. No payments were made; some clothes and rations were provided. Settlers expected Aboriginal people to supplement rations with food caught in the traditional way, despite the fact that the capacity to live in a traditional way was gradually being eroded. It was inevitable that hungry Aboriginal people killed introduced livestock so they could eat. This was a criminal act, so they were hunted down and often killed (Host & Owen, 2009). In some areas at certain times they were brought to prisons where they were shackled with other prisoners and forced to construct roads (Woorunmurra & Pedersen, 2012). The position of Aboriginal people became so perilous that between 1880 and 1920 the Western Australia Government instituted ration stations across the state (Smith, 2000). After the *Aborigines Act 1905*, WA children who were perceived to have some Caucasian features were stolen, that is, forcibly removed and placed in orphanages, missions and settlements. In 1997, “Bringing Them Home”, a national inquiry into the Stolen Generations, estimated that as many as one in three Indigenous children were removed from their families between 1910 and the 1970s (Australian Human Rights Commission, 1997). Acts of resistance to this are now legend within the Aboriginal community; for example:

> When I was little I remember hiding under my Grandmother’s skirt because the police were looking for us. One of things in the rations was black boot polish, it makes me laugh now, how did they think we could afford boots when they didn’t pay us! We used that boot polish to darken our faces when the police came. (Davis & Davis, 2016)

For the most part, stolen children were forbidden to speak their language. There are innumerable accounts of children in these institutions being persistently and extremely hungry. At New Norcia orphanage, for example, children were fed almost exclusively on a “soup” made by boiling a sheep’s head (Davis & Davis, 2016). At Moore River Settlement, a group of grandparents camped outside the settlement and secretly fed children through the fence (Nannup, 2014). Many Aboriginal families were confined to reserves. From there local farmers could recruit people to work. Under the provisions of the *Aborigines Act 1905* in WA, 75% of their wage would go directly to the Department of Native Affairs (after 1955 it was known as the Department of Native Welfare). The worker had to write to the office and request money, but it was often denied. The worker had only the rations the farmer provided to take home to feed his family (Haebich, 1992). Often this was nothing, and many families experienced generation after generation of hunger:

> A main problem was … station—it was their kids we were sitting up nursing at night and watching die. It had a very bad history. The diet on was bread and tea, three times a day. This was the ration. So the women would go up and get a hunk of bread and a billy of tea and some meat when a killer (a cow) came in. The best cuts went to the top house, then the next best to the manager and then further down—it would be the hooves and the horns and the gut and entrails and stuff like that which would be brought up into the camp and boughs and leaves would be got and this stuff dropped into the middle of it and the women would rush out and the dogs would rush out—it was appalling. (Interview 9, 1963, as cited in Smith, 2000, pp. 91–92)

In 1967, employers were forced to pay Aboriginal workers award rates; some could not afford to and some refused to pay. The tendency on farms and cattle and sheep stations was to keep the best workers, while others were placed on trucks and dumped at reserves that had no amenities. Josie Samson was born at Gudjawarral Yirramagurdu (Roebourne reserve) in 1966. During her childhood over 300 people were dumped there.

> A lot of kids died here, mumps, diarrhoea, we had no medications, we had no money. We only had one tap that was based in the centre. My dad was working but he was only paid in rations. He would come home with onions, potatoes, a new hat, press button shirt, a scarf and RM William boots. There was a tin of dripping and sugar and tobacco, Tallyho papers and a windproof box of matches because they used to use that when they were mustering. (Samson, as cited in Robertson & Nannup, 2017)

Throughout the time and in all places, Aboriginal people were subjected to violence in the form of rape and race-based assaults. There was also a level of violence within the reserves, which:

> … came to resemble patterns of living of dispossessed people throughout the world. Like such people, the Aborigines also experienced considerable stresses and strains. Inadequate facilities and poor levels of nutrition meant that the families frequently suffered from poor health. Child mortality remained high in the camps and life expectancy was low. (Haebich, 1992, p. 242)

There are parallels between the Irish and the Aboriginal situations in that the occupation was extensive and permanent and significantly eroded the capacity to access resources. The occupations in both areas intended, at the very least, to diminish Indigenous language and culture. In Ireland, however, the famines were shatteringly severe but confined within a seven-year period. In Western Australia, famine and subfamine conditions were created sporadically over decades; however, many regularly experienced hunger.

Pathways

The effects of famine and community violence can be transmitted to descendants of survivors, where it is often seen as adverse physical and mental health outcomes. Three transmission epigenetic pathways have been identified: phenotypic changes in both sperm and ovum (Cunliffe, 2016; Heijmans et al., 2008; Imam & Ismail, 2017), and as a result of compromised caregiver-child attachment relationships (Coall et al., 2016). Epigenetic transmission concerns the environmental influences that affect how and when genes are switched on and off. Genes form complex networks so that sometimes it is the network rather than individual genes that are switched on or off (Davies, 2019). During the process of gamete formation and embryonic development, epigenetic markers caused by significant stress are created in a sex-specific way. The most common process is called cytosine methylation, which acts to silence gene expression. These mechanisms appear to

be adaptations that calibrate an organism's physiology to their environment (Dickins & Rahman, 2012). Soubry (2015) summarises the research on impacts as:

> • Malnutrition and associated vitamin deficiencies can lead to metabolic alterations in subsequent generations;
> • Life style related exposures such as stress and smoking can lead to disturbances embryonic and fetal growth and developments; and
> • Exposures to toxic substances can lead to metabolic disease and cancer in subsequent generations. (p. 80)

Breastfeeding also creates epigenetic pathways both in terms of nutrition (Verduci et al., 2014) and in terms of attachment (Spinelli, Bonacini, Curati, Birocco & Surbek, 2014). For example, a secure attachment relationship, particularly when associated with late weaning, has a number of positive outcomes. Consequently, early weaning reduces the effect of those positive impacts. The following example tracks breastfeeding in Aboriginal populations to illustrate changes over time. Aboriginal people and observations made by settlers indicate Aboriginal mothers living in a traditional context breastfed their infants for up to six years and breastfed each other's children when the need arose (Hassell, 1975; Salvado, as cited in Storman, 1977). Contemporary studies indicate that late weaning can reduce birth and infant mortality rates (Kramer & Kakuma, 2012). A traditional lifestyle is associated with lower hormone levels that when further suppressed during lactation also delays conception (Jasienska, Bribiescas, Furberg, Helle, & Núñez-de la Mora, 2017). Late weaning has other benefits; it means an infant acquires antibodies from mother's breast milk and does not need to drink water, thus the infant is protected from diseases associated with contaminated water. A global systemic review on the optimal duration of breastfeeding indicated infants who were exclusively breastfed for six months had a significantly reduced risk from gastrointestinal problems and in some areas, respiratory infection (Kramer & Kakuma, 2012), which are major causes of infant mortality in traditional societies (Hill, Hurtado, & Walker, 2007). Late weaning provides the opportunity for a prolonged mother-infant attachment relationship.

In Western Australia between 25,000 and 15,000 years ago there was a severe drought associated with the Last Glacial Maximum (Monroe, 2011). During that time, most of the Australian megafauna became extinct (Hiscock, 2008). Archaeologists suggest that population numbers fell by approximately 60% after having stable sustained growth (Williams, Ulm, Cook, Langley, & Collard, 2013). Despite the terrible environmental pressures on the population there is no evidence of famine or warfare. Late weaning may help to explain this because it "adapts" the child's growth to the level of available protein—where maternal nutrition is compromised, exclusively breastfed infants are less likely to be stunted or underweight but not significantly so (Kramer & Kakuma, 2012). This may indicate that poor nutrition in one generation leads to smaller offspring in the next. In a modern context this has negative connotations, being referred to as stunting and wasting, but from an evolutionary perspective it can be understood as developmental plasticity, an adaptation to diminishing resource availability. This epigenetic effect associated with late weaning enables populations to adapt, over generations, to reductions and changes in nutrition associated with gradual climate change. The reduction in stature over generations in response to maternal malnutrition and stress was noted in the descendants of famine survivors and is theorised as "intergenerational phenotypic inertia", which limits changes in growth rate in response to short-term ecologic fluctuations, and responds to longer term nutritional trends in the local ecology (Kuzawa, 2005).

Intergenerational impacts of hunger and violence

Physical health and longevity

In summarising the evidence for the impact on nutrition on the epigenetic burden of non-communicable chronic disease, Imam and Ismail (2017) found that parental starvation around the time of conception and early gestation were reported to significantly affect health outcomes in offsprings' adult life. Health outcomes particularly included increased risks of type 2 diabetes, cardiovascular diseases, behavioural issues and raised levels of mental illness, including schizophrenia and depression. Imam and Ismail found these outcomes in postfamine cohorts in Europe, Asian and Africa, while similar effects have been found in the descendants of Holocaust survivors (Bercovich, Keinan-Boker, & Shasha, 2014).

At one level, the connection between parental hunger and health outcomes for their descendants is that they are born "epigenetically primed" for a hungry life. While this may support survival when there is hunger in the short term, it becomes a problem when there is sufficient or abundant food available. The epigenetic response, however, is more complex, and descendants of famine can be said to be "epigenetically primed" for a shorter lifespan. For example, risky and uncertain environments associated with poverty and community violence, and particularly when associated with high local mortality, create anger, fear and despair; this can affect parents' capacity to respond to children's signals, contributing to insecure attachment (Coall & Chisholm, 2010). These poor attachment experiences are embodied in the form of hormonal disruptions, which can switch genes on and off, and affect how cells read genes. Typically, the juvenile phase is truncated, sexual maturity is reached early (Belsky, Steinberg, & Draper, 1991), first reproduction occurs earlier, and there are more pregnancies (Coall et al., 2016). Although this pattern is not as consistently found in more traditional societies **(**Sear, Sheppard, & Coall, 2019), all the health outcomes of being born "epigenetically primed" for hunger and a shorter life span can be seen in the health and life profiles of Aboriginal people. They are:

- 1.6 times as likely to be obese as non-Indigenous Australians, after adjusting for differences in the age structure of the two populations (Diabetes Australia, 2017);
- almost four times more likely than non-Indigenous Australians to have diabetes or pre-diabetes (Diabetes Australia, 2017);
- 70% more likely to die from circulatory diseases (Heart Foundation, 2017); and
- more likely to die younger: Indigenous males born between 2015 and 2017 have a life expectancy of 71.6 years (8.6 years less than non-Indigenous males) and Indigenous females have a life expectancy of 75.6 years (7.8 years less than non-Indigenous females; Closing the Gap, 2019).

Mental health

Studies on post-famine cohorts also note higher rates of mental illness; for example, the most exposed cohort conceived during *De Hongerwinter* showed a twofold increased risk of schizophrenia (Susser & Lin, 1992; Susser et al., 1996). A similar effect was found in the descendants of the 1959–1961 Chinese famine (St Clair et al., 2005). *An Gorta Mor* occurred much earlier when observable mental illnesses were referred to as lunacy or insanity. Walsh (2018) describes the escalating rates of lunacy as indicated by admissions to the local asylum in the shrinking population of the province of Connaught in the West Coast of Ireland in the post-famine years:

> The Famine years (c1845–52) saw a sharp drop in the population of approximately two million, through a combination of famine-related mortality and emigration. By 1901, the general population numbered 4.4 million reflecting large scale patterns of permanent migration consolidated by the famine years. But as the population halved, the proportionate numbers of insanity cases rose sharply, with 17,000 patients in the district asylum in 1900 and an estimated 8,000 further insane people “at large”, with no beds available for care. (Walsh, 2018, p.178)

These rates are similarly reflected in the places Irish people migrated or were exiled to: Studies of admissions to asylums in Canada, Australia and Britain show that the Irish are disproportionately over-represented in comparison with other migrant groups (Walsh, 2018, p.175). Champagne and Meaney (2006) suggest that offspring whose attachment is disrupted have lower levels of glucocorticoid receptors in the brain. This manifests itself in subsequent generations as greatly elevated levels of post-traumatic stress syndrome, as well as problems with addiction.

The rate at which contemporary Aboriginal people are hospitalised for problems associated with mental health are high both for psychotic and mood disorders. Between 2008 and 2009, they were four times more likely to be hospitalised for schizophrenia and delusional disorders than other Australians and, in 2016, twice as likely to die from intentional self-harm (Burgess, Christian, McIntyre, & Mole, 2017).

Linguistic trauma

The complexity and persistence of mental illness, particularly in the post-famine Irish cohort and in Aboriginal people, led the authors to speculate whether there were other factors that enhanced rather than mitigated against the transmission of trauma of famine and community violence across generations. Perhaps the most significant common factor is what the authors are calling linguistic trauma, associated with an often violent repression of innate language or mother tongue. Contemporary psychology suggests that in the process of recovery from trauma, an individual needs to make sense and meaning, to express their experience, and eventually to form a coherent narrative about the event(s) and their place in it (Park, 2010). This is particularly the case for traumatised women as they enter motherhood (Stern, 1998). This requires language; but what happens when language does not have a trauma-related vocabulary?

In the five generations since *An Gorta Mor*, it was rarely referred to, and it was almost never treated within literature. In 1995, some factors contributing to this silence were described as:

> … the lack of memory is a consequence of the severity of the Famine, having been suppressed either because of the trauma of the period or the guilt of those who survived at the expense of others' lives. This is held to apply variously to individuals, to groups or communities, and to a “national” psyche … the horror of the Famine exceeded the capacity of literary forms to deal with it. The argument is sometimes extended to the capacity of language as such; for example, by Fintan O'Toole, writing about a letter in the Strokestown Famine Museum: “The rage and grief fall between the cracks of a language which, stretched beyond breaking point, is unable to contain them.” (O Cioséin, 1995, p. 7)

The British occupation of WA introduced what would have been alien concepts for Aboriginal people—there are no words in Aboriginal languages that describe an orphaned or illegitimate child. The theft of children, therefore, would have been a bewildering event on top of the shock and grief. In the generations since this has become encapsulated in

two words, “Stolen Generations”. Contemporary researchers found that outcomes for their descendants in WA includes greater vulnerabilities to addiction and mental health problems and that they are likely to encounter the justice system (De Maio et al., 2005). Linguistic trauma is likely to be a contributing factor to this greater vulnerability. Those who were stolen were typically prevented from speaking their mother tongue. Many were placed in missions and orphanages well away from their homeland, which reduced exposure to native tongue.

> … the department (of Native Affairs) had a rule—North girls were sent south to jobs and Sou-westers were always sent north. They were very strict about that because they meant for us never to find our way back home. (Nannup, 1992, p. 120)

Being raised in an orphanage is now known to have adverse effects; children in institutional care show delays and maladaptation in various domains of development, although the effects vary (Van IJzendoorn et al., 2011). For stolen Aboriginal children, this effect was compounded by an absence of innate language through which they could begin to process their experiences. The language of those in charge of them was by definition punitive and did not provide any kind of substitute.

The terrible and relentless loss suffered by stolen children, compounded by the paucity of substitute care, was often overlaid by maltreatment and sexual abuse. There is emerging research suggesting an association between maltreatment and decreased language skills. Language disorder is associated with higher rates of retrospectively reported child sexual abuse and greater severity of sexual abuse (Brownlie, Graham, Bao, Koyama, & Beitchman, 2017). It is not understood whether poor language skills makes a person more vulnerable to sexual abuse or whether sexual abuse is a contributor to poor language development or both.

The children of those who were stolen before they developed an innate language were also at a significant disadvantage. The authors speculate that the policies, which kept them in severe poverty, were compounded by the linguistic trauma suffered by their parents whose lost innate language and inadequate adopted language meant they had trouble conceptualising their own sense of self and of narrating a family identity. It is now understood that one of the contributors to the correlation between maternal poverty and lower literacy levels and cognitive abilities in their children is that the auditory system does not develop well. Such children are found to have noisier neural activity than their classmates, which is noise generated in the absence of auditory stimulation. They may have more erratic over-repeated stimulation, with lower fidelity to the input signal (Skoe, Krizman, Spitzer, & Kraus, 2015). This in turn inhibits language development. People with any of the mental health problems and disorders, including post-traumatic stress disorder, which may be a legacy of famine and community violence, have difficulties with executive functioning. Executive functioning includes working memory, inhibitory control and cognitive flexibility; it allows you to get on with your daily life and to manage the impact of early experiences (National Scientific Council on the Developing Child, 2011). Many of the difficulties with executive functioning are thought to arise because critical amounts of cognitive resources are taken up in dealing with emotionally laden thoughts, feelings, and behavioural urges that prevent the sufferer from focusing on everyday tasks (Mason et al., 2007).

Resilience

In undertaking the research for this article, the authors found numerous examples of resilience that, like epigenetic pathways, span generations. For example, one Elder talked

about his father who had been stolen as a baby and grew up in a punitive institution. In his adult life he was constantly hungry for words; he found the “It pays to increase your word power” section of a magazine, *The Readers Digest,* which was then in circulation, particularly interesting. Through this he acquired a vast vocabulary. When approached by police or others in authority he stunned them with eloquence. His granddaughter subsequently became a linguist specialising in his innate language.

Epigenetic pathways elicited by the environment, through which subsequent generations may be primed to survive a hungry life or a shortened lifespan, have other implications for the life cycle. A common finding is that women have their first child at a younger age, and there has been an increase in the number of offspring (Coall et al., 2016). This is so for contemporary Aboriginal people whose total fertility rates were 2.115 births per 1,000 compared with 1.789 per 1,000 for all women, and whose median age at first motherhood was 25.5 years compared with 31.2 years for all mothers (Australian Institute of Health and Welfare, 2016). In 2016, Aboriginal and Torres Strait Islander peoples represented 2.8% of the population, up from 2.5% in 2011, and 2.3% in 2006.

Both epigenetic pathways and intergenerational trauma pathways are important topics of inquiry now because they help to identify windows of opportunity for targeted interventions to enhance health and educational opportunities for Aboriginal people. This will be explored in future research. Additionally, this research enables the identification narratives of resilience, an important process in the healing of families, particularly from the Stolen Generations.

Conclusion

There is no doubt that some Aboriginal people in Western Australia were subjected to hunger and violence for protracted periods during the last eight generations. The effects of such conditions on the descendants of affected populations in other countries show elevated rates particularly of obesity, type 2 diabetes, heart disease and mental illness. Similarly, Aboriginal and Torres Strait Islander people also have elevated rates, particularly of obesity, type 2 diabetes, heart disease and mental illness. A number of mechanisms by which the effects may transferred from one generation to another have been described. These epigenetic pathways, resulting from reduced nutrition and from poor attachment experiences and linguistic trauma, which may inhibit the process of recovery from trauma, will be usefully explored in future research. There are also resilience pathways that span generations; these are family stories in which recovery and restoration of health and language can be seen. The Aboriginal and Torres Strait islander community is also on a resilience pathway that began with the restoration of population numbers. In both an ironic and a positive sense, environments of hunger and community violence can be said to be a gift that keeps on giving.

References

Arnold, M. (2015). *A journey travelled: Aboriginal-European relations at Albany and surrounding regions from first colonial contact to 1926.* Perth, Australia: UWA Press.

Australian Human Rights Commission. (1997). *Bringing them home: Report of the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from Their Families.* Sydney, Australia: Author. https://www.humanrights.gov.au/publications/bringing-them-home-chapter-7

Australian Institute of Health and Welfare. (2016). *Australia's Health 5.8, Main contributors to the Indigenous life expectancy gap* (Australia's Health Series, No. 15, Cat. no. AUS 199). Canberra, Australia: Author. Retrieved from https://www.aihw.gov.au/getmedia/5d39a104-a2d5-4ab5-900c-697ee0e5a1d8/ah16-5-8-main-contributors-indigenous-life-expectancy-gap.pdf.aspx

Belsky, J. Steinberg, L., & Draper P. (1991). Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development*, *62*, 647–670. doi:10.1111/j.1467-8624.1991.tb01558.x

Bercovich, E., Keinan-Boker, L., & Shasha, S., S. (2014). Long-term health effects in adults born during the holocaust. *Israel Medical Association Journal, 16*(4), 203–207.

Brownlie, E.B. Graham, E., Bao, L., Koyama, E., & Beitchman, J.H. (2017). Language disorder and retrospectively reported sexual abuse of girls: Severity and disclosure, *Journal of Child Psychology and Psychiatry, 58*(10),1114–1121 doi:10.1111/jcpp.12723

Burgess, K., Christian, L., McIntyre, J., & Mole, T. (2017). *Admitted patient care 2015–16: Australian hospital statistics.* Canberra, Australia: Australian Institute of Health and Welfare.

Champagne, F., & Meaney, M. (2006). Stress during gestation alters postpartum maternal care and the development of offspring in a rodent model. *Biological Psychiatry, 59*(12), 227–235.

Closing the Gap. (2019). *Report to the Department of the Prime Minister and Cabinet Australian Government.* https://ctgreport.pmc.gov.au/sites/default/files/ctg-report-2019.pdf?a=1

Coall, D., & Chisholm, J. (2010). Reproductive development and parental investment during pregnancy: Moderating influence of mother's early environment. *American Journal of Human Biology, 22*, 143–153. doi:10.1002/ajhb.20965

Coall, D. A., Tickner, M,. McAllister, L.S. and Sheppard, P. (2016). Developmental influences on fertility decisions by women: An evolutionary perspective. *Philosophical Transactions of the Royal Society B: Biological Sciences, 371*(1692), 20150146. doi:10.1098/rstb.2015.0146.

Crowley, J., Murphy, M., & Smith W.J. (Eds). (2012). *Mortality during the Great Famine, The Atlas of the Great Irish Famine*. Cork, Ireland: Cork University Press.

Crowley, T. (2017). Language, Politics, and the State(s): Reflections from Ireland. *Harvard Ukrainian Studies, 35*(1/4), 331–349.

Cunliffe, V. (2016) The epigenetic impacts of social stress: How does social adversity become biologically embedded? *Epigenomics, 8*(12), 1653–1669. doi:10.2217/epi-2016-0075

Davis, K., & Davis, R. (2016). *Land of Ancient Tears, Wyalkatchem, the Nyoongar story.* Perth, Australia: Edith Cowan University.

Davies, P. (2019). What is life? In search of a unified theory of everything. *The Monthly,* February, 51.

De Maio, J. A., Zubrick, S. R., Silburn, S. R., Lawrence, D. M., Mitrou, F. G., Dalby, R. B., & Cox, A. (2005) *The Western Australian Aboriginal Child Health Survey: Measuring the social and emotional wellbeing of Aboriginal Children and intergenerational effects of forced separation*. Perth, Australia: Curtin University of Technology and Telethon Institute for Child Health Research. Western Australia

Diabetes Australia. (2017). Retrieved July 1, 2017 from https://www.diabetesaustralia.com.au/aboriginal-and-torres-strait-islanders

Dickins, T. E., & Rahman, Q. (2012). The extended evolutionary synthesis and the role of soft inheritance in evolution. *Proceedings of the Royal Society B: Biological Sciences, 279*(1740), 2913–2921. https://doi.org/10.1098/rspb.2012.0273

Haebich, A. (1992). *For Their Own Good: Aborigines and Government in the south west of Western Australia 1900–1940*. Perth, Australia: UWA Publishing; for the Charles and Joy Staples South West Region Publications Fund.

Hart, N. (1993). Famine, maternal nutrition and infant mortality: A re-examination of the Dutch Hunger Winter. *Population Studies, 47*(1), 27–46.

Hassell, E. (1975). *My dusky friends: Aboriginal life, customs and legends and glimpses of station life at Jarramungup in the 1880's*. East Fremantle, Western Australia.

Heart Foundation. (2017). https://www.heartfoundation.org.au/about-us/what-we-do/heart-disease-in-australia/cardiovascular-risk-profile-of-aboriginal-and-torres-strait-islander-peoples

Heijmans, B. T., Tobi, E. W., Stein, A. D., Putter, H., Blauw, G. J., Susser, E. S., … Lumey, L. H. (2008). Persistent epigenetic differences associated with prenatal exposure to famine in humans. *PNAS, 105*(44) 17046–17049. https://doi.org/10.1073/pnas.0806560105

Hill, K., Hurtado, A. M., & Walker, R. S. (2007). High adult mortality among Hiwi hunter-gatherers: implications for human evolution. *Journal of Human Evolution, 52*(4), 443–54. doi:10.1016/j.jhevol.2006.11.003

Hiscock, P. (2008). *Archaeology of ancient Australia*. London, UK: Routledge.

Hitchcock, W. I. (2009). *The bitter road to freedom: The human cost of allied victory in World War II Europe.* Simon & Schuster.

Host, J., & Owen, C. (2009). *“It’s still in my heart. This is my country.” The single Noongar claim history.* Perth, Australia: University of Western Australia Publishing.

Imam, M. U., & Ismail, M. (2017). The impact of traditional food and lifestyle behavior on epigenetic burden of chronic disease. *Global Challenges, 1,* 1700043. https://doi.org/10.1002/gch2.201700043

Jasienska, G., Bribiescas, R., Furberg, A., Helle, S., & Núñez-de La Mora, A. (2017). Human reproduction and health: An evolutionary perspective. *The Lancet, 390*(10093), 510–520. https://doi.org/10.1016/S0140-6736(17)30573-1

Kramer, M. S., & Kakuma, R. (2012). Optimal duration of exclusive breastfeeding. C*ochrane Database of Systematic Reviews* (8) CD003517. doi:10.1002/14651858.CD003517.pub2.

Kuzawa, C. W. (2005). Foetal origins of developmental plasticity: Are foetal cues reliable predictors of future nutritional environments? *American Journal of Human Biology, 17*(1), 5–21. doi:10.1002/ajhb.

Lumey, L. H., Stein, H. S. K., van der Pal-de Bruin, K. M., Blauw, G. J., Zybert, P., & Susser, E. S. (2007). Cohort profile: The Dutch Hunger Winter Families Study. *International Journal of Epidemiology, 36*, 1196–1204.

Mason, M., Norton, M., Van Horn, J., Wegner, D., Grafton, S., & Macrae, C. (2007). Wandering minds: The default network and stimulus-independent thought. *Science, 315*(5810), 393–395. https://doi.org/10.1126/science.1131295

Monroe, M. H. (2011). *Australia: The land where time began*. Retrieved from http://austhrutime.com

Nannup, A. (1992). *When the pelican laughed*. Fremantle, Australia: Fremantle Arts Centre Press.

Nannup, N. (2014). Interviews with Elders in Residence (Unpublished data). Perth, Australia: Edith Cowan University.

National Scientific Council on the Developing Child. (2011). *Building the brain's "Air Traffic Control" system: How early experiences shape the development of executive function* (Working Paper No. 11). Cambridge, MA: Center on the Developing Child, Harvard University. www.developingchild.harvard.edu

O Cioséin, N. (1995). Was there "silence" about the famine? *Irish Studies Review, 4*(13), 7–10. doi:10.1080/09670889508455509

Park, C. L. (2010). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin, 136*, 257–301.

Robertson, F., & Nannup, N. (2017). *Long Way Long Time: Report to Main Roads WA for the Western Australian Aboriginal Journey Ways Project*. Perth, Australia: Main Roads WA.

Ross, D. (2002). *Ireland: History of a nation*. New Lanark, Scotland: Geddes & Grosset.

Sear, R., Sheppard, P., & Coall, D. A. (2019). Cross-cultural evidence does not support universal acceleration of puberty in father-absent households. *Philosophical Transactions of the Royal Society B, 374*, 20180124. http://dx.doi.org/10.1098/rstb.2018.0124

Skoe, E., Krizman, J., Spitzer, E., & Kraus, N. (2015). Prior experience biases subcortical sensitivity to sound patterns. *Journal of Cognitive Neuroscience, 27*(1), 124–140. https://doi.org/10.1162/jocn_a_00691

Smith, P. A. (2000). Station camps: Legislation, labour relations and rations on pastoral leases in the Kimberley region, Western Australia. *Aboriginal History, 24,* 75–97.

Spinelli, M., Bonacini, O.E., Curati, G., Birocco, N. & Surbek, D. (2017). The attachment theory today: From the epigenetic effects of maternal behavior to psyco-neuro- endocrino-immunology. *Journal of Clinical Epigenetics, 3,* 43.

Soubry, A. (2015). Epigenetic inheritance and evolution: A paternal perspective on dietary influences, *Progress in Biophysics and Molecular Biology, 118*(1–2,) 79–85. https://doi.org/10.1016/j.pbiomolbio.2015.02.008

St Clair, D. C., Xu, M., Wang, P., Yu, Y., Fang, Y., Zhang, F., … He, L. (2005). Rates of adult schizophrenia following prenatal exposure to the Chinese famine of 1959–1961. *JAMA, 294*(5), 557–562. doi:10.1001/jama.294.5.557.

Stern, D. (1998). Mothers' emotional needs. *Pediatrics, 102*(Suppl. 5), 1250–1252.

Stormon, E. J. (Ed. & Trans.). (1977). *The Salvado memoirs*. Perth, Australia: University of Western Australia Press.

Susser, E., & Lin, S. P. (1992). Schizophrenia after prenatal exposure to the Dutch Hunger Winter of 1944–1945. *Archives of General Psychiatry*, *49*, 983–988.

Susser, E., Neugebauer, R., Hoek, H. W., Brown, A. S., Lin, S., Labovitz, D., & Gorman, J. M. (1996). Schizophrenia after prenatal famine: Further evidence. *Archives of General Psychiatry, 53,* 25–31.

Van IJzendoorn, M. H., Palacios, J., Sonuga-Barke, E. J. S., Gunnar, M. R., Vorria, P., McCall, R. B., & Juffer, F. (2011). Children in institutional care: Delayed development and resilience. *Monographs of the Society for Research in Child Development, 76*(4), 8–30. http://doi.org/10.1111/j.1540-5834.2011.00626.x

Verduci, E., Banderali, G., Barberi, S., Radaelli, G., Lops, A., Betti, F., … Giovannini, M. (2014). Epigenetic effects of human breast milk. *Nutrients, 6*(4), 1711–1724. doi:10.3390/nu6041711

Walsh, O. (2018). An inescapable trauma; Epigenetics and the Great Famine. In C. Kineally, J. King, & C. Reilly (Eds.), *Women and the Great Hunger, Ireland* (pp. 173–183). Cork, Ireland: Cork University Press.

Williams, A., Ulm, S., Cook, A., Langley, M., & Collard, M. (2013). Human refugia in Australia during the Last Glacial Maximum and Terminal Pleistocene: A geospatial analysis of the 25–12 ka Australian archaeological record. *Journal of Archaeological Science, 40*(12), 4612–4625. https://doi.org/10.1016/j.jas.2013.06.015

Woorunmurra, B. & Pedersen, H. (2012). *Jandamarra and the Bunubu Resistance*. Broome, Australia: Magabala Books.