



Colonial health transitions: Aboriginal and ‘poor white’ infant mortality compared, Victoria 1850–1910[☆]

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Abstract

This paper presents results from the first two longitudinal historical cradle-to-grave datasets constructed in Australia: the Aboriginal population of the state of Victoria, reconstituted using genealogical research and vital registrations, 1835–1930; and an impoverished European population sample born at the Melbourne Lying-In Hospital, 1857–1900 and traced until 1985. It investigates the comparative infant mortality between these two severely disadvantaged population samples and finds apparently contradictory results. Aboriginal people had shorter survival at all ages apart from infancy. Infant mortality among the poor white women delivering in an urban charity hospital was extreme but their survival at all later life stages was superior to that of the Aborigines. Critical for both groups of babies and their mothers was the presence or absence of household support during pregnancy and the first year of life, and the poor whites’ birth weights embodied a social gradient of degrees of family and breadwinner support. Aboriginal babies spent their first year of life, despite the community trauma of cruel government ‘management’ and exclusion from entitlements, in an ecology that protected them from the disorders of feeding and gastrointestinal disease that cut down so many of the poor white babies. The differences in both mortality and causes of death indicate very different relationships between babies and their mothers and fathers and with the state. The sudden fall in the Lying-In Hospital infant mortality from 1887 was effected by direct state and medical interventions. The equally sudden and continuing rise in infant mortality among the Victorian Aboriginal community can be traced to their expulsion from the support of the reserves and the commencement of decades of ‘invisibility’ and denial of state entitlements and medical care.

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Keywords: Infant mortality; Aboriginal; Poverty; Health transition; Colonialism

1. Introduction

Dr William Farr first identified infant mortality as a measure of a community’s risk and it remains a powerful indicator of ill health, social injustice and deprivation at a

population level (Williams & Galley 1995). However its role and significance relative to changes in other age groups, has changed over time. W.O. Kermack was first to perceive that the rise in life expectancy in the British Isles and northern Europe began with steadily improving survival among children from the 1860s. And that as each cohort was better fed and less exposed to fatal infections, so the whole cohort lived longer. Infant mortality, however, lagged behind, not commencing its

[☆] Funded by the Australian Research Council.

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fall until the 1890s when a healthier cohort of girls grew up to become healthier mothers (Kermack, McKendrick and Mckinlay, 1934; Smith & Kuh, 2001). Exposures including socio-economic conditions in childhood are now of major interest to life-course epidemiology (Galobardes, Lynch and Davey Smith, 2004) possibly acting via epigenetic mechanisms (Kaati, Bygren and Edvinsson, 2002; Foley et al. 2009). Infant mortality remains of interest for its own sake and as a calibrator of household and neighbourhood wellbeing.

In Australia, the population level data for infant mortality does not begin until 1870 and the timing of the decline varied from colony to colony, depending on the levels of development and El Niño episodes with lower rainfall and higher average temperatures (McCalman 2005). In Victoria, infant mortality began to fall in the 1890s, stalled around Federation, and then fell sharply as it did throughout the nation after 1903 (Mein Smith 1997). See Fig. 1. However, within certain discrete populations—urban dwellers in Melbourne who were ‘charity’ babies born in the Melbourne Lying-In Hospital, and Aboriginal babies recorded from the nadir of the indigenous population to its recovery—the changes in mortality were distinctive.

This analysis of infant mortality is a further stage of a study of micro colonial health transitions using the comparison of an impoverished, urban sub-set of the colonizing population—‘poor white’ babies born in a charity hospital in Melbourne (the Melbourne Lying-In Hospital Birth Cohort, 1857–1900 or LIH) with a dataset of the surviving Aboriginal population, 1855–1920, (the Koori Health Research Database or KHRD) that has been reconstituted using genealogy derived

from vital registrations and archival records of Aboriginal administration by the colonial state. Thus it includes both ‘official’ Aboriginal people who were recorded by the government and their part-Aboriginal relatives who were merged with the white population, but who always considered themselves ‘Aboriginal’ and were discriminated against as ‘unofficial’ Aborigines (McCalman, Morley and Mishra, 2008; Smith et al. 2008; McCalman, Smith, Anderson, Morley and Mishra, 2009). Survival analysis for the two populations divided into historical cohorts, revealed a difference between indigenous and poor white adult survival and infant mortality. While Aboriginal mortality was higher than the ‘poor whites’ in childhood and adulthood, Aboriginal babies did better than the LIH babies (Broome 2005; McCalman et al. 2008; Smith et al. 2008). See Fig. 2.

This study uses cause-specific mortality to understand both the distinctiveness of these two impoverished and marginalised populations in colonial Victoria, and the reasons for their respective changes in the rates of infant mortality. In so doing, it can illuminate the impact of colonization on both the colonized and the colonizing.

Colonial Victoria was fortunate that its system of vital registration was established in 1853 by a statistician, W.H. Archer, who was a disciple of Dr Farr and determined to provide a new, rapidly growing colony with sound data on its people, their health and progress (Hopper 1986). At the same time, a charity lying-in hospital was founded by two ambitious young doctors, both of whom had undertaken postgraduate study in Paris and who regarded detailed clinical records and statistical analysis as essential to good practice

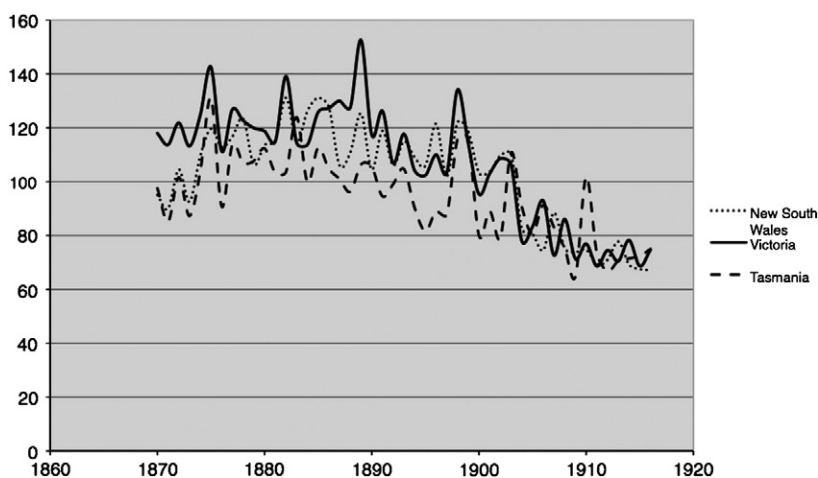


Fig. 1. Infant mortality 1860–1920, New South Wales, Victoria, Tasmania and Australia.

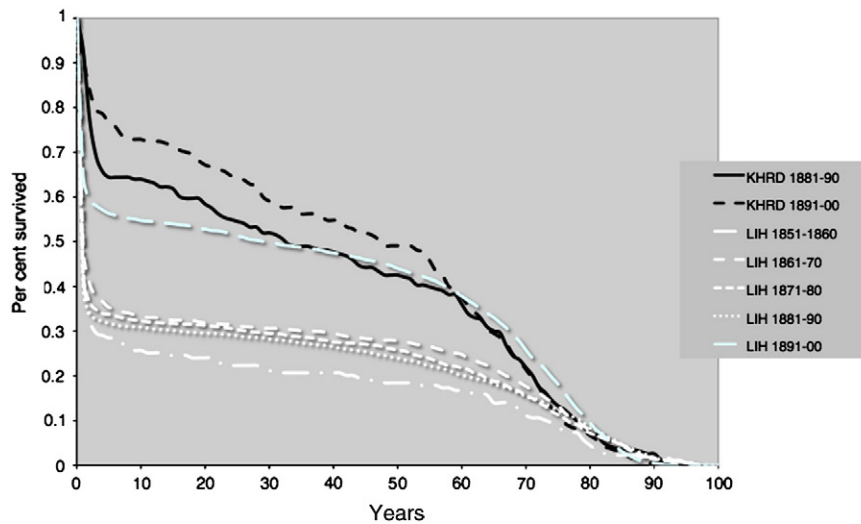


Fig. 2. Survival analysis of KHRD and LIH birth cohorts.

(McCalman 1999). Third, the new colony of Victoria was leading the way in the control and administration of its dispossessed Aboriginal people, being the first colony to establish a protectorate (1838) and the first to institute an Act for the Protection of Aborigines (1861) that over time became an unfortunate and repressive model for the rest of the continent (Broome 2005). Formed at the nadir of the destruction of the Victorian Aboriginal world, the protectorate established viable micro-economies for just long enough to secure the survival and recovery of those families who went on to the reserves. The co-incidence of these three institutional developments has resulted in an archival record of unusual depth and precision for the births, deaths and wellbeing of the two most vulnerable groups in the new colony: Aboriginal people and poor European incomers.

2. Materials and methods

The two population samples are cradle-to-grave datasets, constructed from Victorian birth, death and marriage certificates. These have been indexed on CD ROM to facilitate searching and the high level of family history required by the Victorian registrar since 1855 makes it possible to triangulate sources and follow women in particular, despite name changes. The ‘poor white’ sample was captured from the midwifery books of the Melbourne Lying-In Hospital (now Royal Women’s Hospital), 1857–1900. These records provide the mother’s name, place of birth, age, marital status and parity; and the baby’s sex, weight, length and any

complications or interventions in the delivery; as are length of the second stage of labour and length of stay in the hospital. Stillbirths were recorded but are not included in this dataset. The birth certificate provides the infant’s name, mother’s maiden and married names, her previous children and father’s name and occupation (if known), the accoucheurs, and the name, relationship to the infant and signature of the person registering the birth. The death certificate provides up to four causes of death and their duration certified by a medical practitioner, and a full family history of the deceased provided by the named witness reporting the death. Again the witness to the death is named, along with their relationship to the deceased: mother, grandmother, father, nurse. The signature also indicates the level of literacy of the witness. The place of residence and the place of death are also recorded. The quality of the family history depended on the knowledge held by the witness to the death. This Lying-In Hospital Cohort (LIH) has been traced for all deaths to 1985, which is the limit to public access to death certificates in Victoria. This censoring affects the 1891–1900 births (McCalman et al. 2008).

The second population, the Aboriginal population of Victoria 1850–1920, has also been constructed from the vital registration certificates, but it has been captured by a retrospective reconstitution of the Aboriginal population using genealogies compiled by many hands over the past fifty years. This has been necessary because most Victorian Aboriginal people have not been identified in official records as indigenous since the 1886 ‘Half-castes Act’ expelled people of part-descent

from the surveillance of the Aboriginal Protection Board. Thus this genealogical reconstitution captures the full population of people who identified themselves as Aboriginal and have been recognised as such in everyday life. This dataset is the Koori Health Research Dataset (KHRD) and it too has traced deaths to 1985 (Smith et al. 2008).

Trained historians undertook the tracing of deaths and triangulated identities through the mother's maiden name, the deceased's age, then any other possible points of identification. Genealogies were constructed to locate babies born later who were given the name of a deceased child (a common practice). Given that many of these 'poor whites' and Aboriginal Victorians were 'outsiders', the reach of the state in the registration of births and deaths was remarkable in this colonial society. Every community had a registrar who was supervised from Melbourne. Dying babies or children who were brought for medical care were reliably registered. Once the Lying-In Hospital took it upon itself to register all the births that occurred in its care (from 1860), we have a reliable birth register of this 'poor white' sample population. Similarly the remnant Aboriginal population was under state surveillance on reserves from the early 1870s, and births were again reliably registered. The police kept a census of Aboriginal people both inside and outside the reserves (Smith et al. 2008). We attempted to trace the LIH mothers' origins in birth and marriage registration, immigration and convict records, and this confirmed that many were 'travelling under aliases' by the time they were admitted to the hospital. Finally, additional archival sources have been used to flesh out the life-course histories of both population samples to build prosopographical datasets: inquests and autopsies, welfare case records from the Melbourne Ladies' Benevolent Society case records, fostering and 'neglected children' records from the Industrial schools and the rich archives of the Central Board of Protection for Aborigines.

LS (a demographer) coded causes of death in the KHRD cohort by working from the nosologies stipulated by the colonial Registrar and then re-coding them to comply with ICD-10 codes. IA (a medical doctor and Indigenous social scientist) interpreted the Aboriginal data. RM (a medical epidemiologist) coded the causes of death in the LIH cohort on the basis of the primary cause of death and then grouped the various causes into broader categories. These included 'respiratory', 'trauma: accident/suffocation' and 'other infections'. When it came to the most common cause of death, apparent gastrointestinal disease, RM concluded that 'gastrointestinal' that was clearly associated with a

toxin was different in symptoms and duration from a constellation of causes of death that are better understood as 'failure to thrive'. These were asthenia, debility, marasmus (includes athrepsia, supposed marasmus, and emaciation), inanition (includes inertia), feeding problems (malnutrition, starvation, mal-assimilation, and overfeeding), improper feeding (or want of breast milk, ab lactation, hand, artificial or bottle feeding, want of proper nourishment, bad nursing, weaning or premature weaning, loss of natural food, unsuitable food, mother died, or failure of mother's milk). The significant symptoms included prolonged diarrhoea and the absence of vomiting. These diagnoses were confirmed by autopsy reports, which provided weight at death.

3. Ethics

The records used are all publicly available. The Aboriginal genealogy remains in the custody of Museum Victoria and can be consulted by community members according to protocols developed by the Museum (<http://museumvictoria.com.au/melbournemuseum/>). All individuals were de-identified before analysis, but de-identified individual Aboriginal cases cannot be discussed because identification is too easy in this small, close-knit population.

4. Results

4.1. Lying-In Hospital (LIH) birth cohort 1857–1900

From 16,278 registered live births between 1857 and 1900, death certificates were traced for 8590 i.e. 53%. Of these, 1283 (15%) died in the first 28 days; 3019 (35%) died age 1–12 months; 1350 (16%) died 1–40 years, and 2938 (34%) died aged 40 years or more. Half of the found cohort (4302/8590) died in infancy (before 1 year). Reasons for the failure to trace infant deaths included mothers giving false names to the hospital; mobility and outmigration; common names without other identifying data; and concealed infant deaths. Single women often married soon after giving birth, but death certificates of their offspring recorded mother's maiden names. Registration, even in rural districts, was thorough by the 1880s so any effect of missed death registration was progressively less significant in the 1880s and 1890s. Outmigration from Victoria was substantial in the 1890s depression, but these 'economic' migrants often returned. We imputed the missing data and the biological and social characteristics of the 47% of births not traced to a

death certificate and they most resembled those who died in infancy i.e. in birth weight, mother's marital status, age and parity. (See [McCalman et al., 2008](#) for a detailed discussion.) We believe, therefore, that the high infant mortality in this cohort cannot be explained on the basis of incomplete ascertainment. Age at death in the infant mortality group, according to the year of birth, is shown in [Fig. 3](#).

Unlike many English lying-in hospitals, the Melbourne institution always admitted unmarried women, including inmates from refuges and prison and women direct from the streets, and throughout the study period, the proportion of single mothers remained around 50%, rising a little in the 1880s when the hospital admitted single women for short periods when there were outbreaks of infection, while married women were sent out to be delivered by private midwives. As the new 'instant city' of Melbourne settled, crime rates slowly fell, but the prosperity of the 1880s collapsed into the worst depression in Australia's history, the effects of which were to linger until the late 1930s. The gravest risk to infant life was being born to a mother who lacked a reliable male breadwinner or a supportive extended family and had to provide for herself. See [Fig. 4](#).

Birth weight embodied that risk both during pregnancy and in survival time. Small babies were the most likely to die in the neonatal period, but still were at a higher risk throughout infancy. See [Fig. 5](#).

After adjustment for birth weight, whether firstborn, mother's marital status and age, father's occupation, and whether from a singleton or twin pregnancy, in logistic regression models, the fall in infant mortality in this discrete population sample of babies born in the Lying-In Hospital was not materially changed. This suggests that the fall in infant mortality in the 1890s was not just because of changes in recorded sociodemographic factors or birth weight.

4.2. LIH birth cohort causes of death

It has been argued that in Australia, all apparent feeding-related deaths should be understood as gastro-intestinal infection and that many such deaths were misdiagnosed as marasmus or 'improper feeding' until the 1890s ([Lewis 1980](#); [Mein Smith 1997](#)). RM considers that there are reasons to believe that the group of causes of death we categorised as 'failure to thrive' constitutes an important separate entity. Firstly, there is considerable seasonal variation in deaths from conditions grouped as "gastroenteritis", with many more deaths in summer than in winter (often described as summer diarrhoea) (see [Fig. 6](#)). Conversely the entity described as failure to thrive showed little seasonal variation.

Secondly, over time the most significant fall was in 'failure to thrive' (see [Fig. 7](#)). It is of interest that as failure to thrive deaths fell from 1885 to 1900, there was not a reciprocal rise of a similar magnitude in deaths from gastroenteritis, suggesting that change in diagnosis from 'failure to thrive' to gastroenteritis was not the main explanation.

4.3. Koori Health Research Dataset (KHRD) comparative infant mortality

Our reconstruction of the Aboriginal population of Victoria 1780–2000 has been described in full elsewhere ([Smith et al. 2008](#)) and [Fig. 8](#) shows the nadir of the Aboriginal population (1850–1930) that is under discussion here.

The number of infant deaths was much smaller in the KHRD because of the smaller average size of the birth cohorts (about 200) and the lower rate of infant death, which in the early period rarely reached 100 per thousand. The odds ratios could not be calculated until

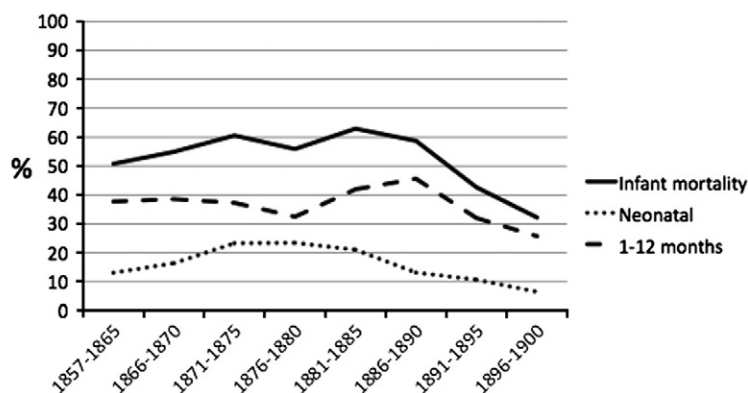


Fig. 3. LIH infant mortality as a percentage of total mortality by year group, 1857–1900.

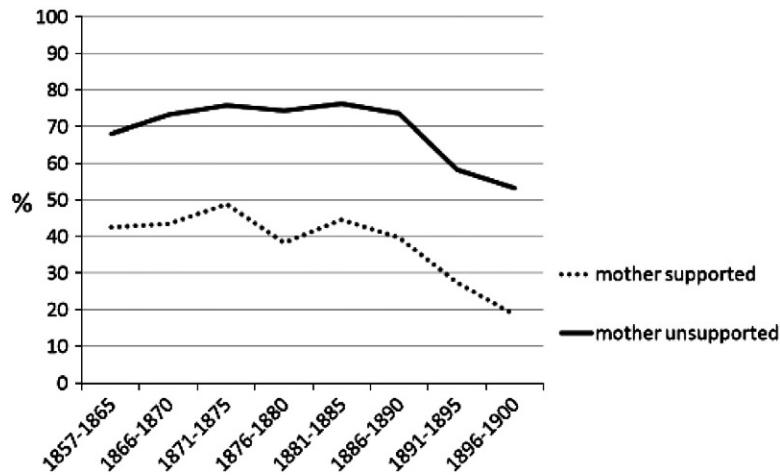


Fig. 4. LIH infant mortality by year group for supported (married) mothers and unsupported (unmarried, deserted, and widowed) mothers.

the 1871–80 cohort. However, the odds ratios compared to the LIH revealed a major rise in infant mortality in the 1890s, just as the LIH infant mortality was falling and the expulsion of part-Aboriginal people from the reserves. See Fig. 9.

The causes of death of Aboriginal babies were different from the LIH babies. Gastrointestinal causes and failure to thrive were fewer, and from the 1880s respiratory infections became more common. The full population would have been under observation in the reserves, but after 1886, those of part-Aboriginal descent who were over the age of 18 were forced to survive without support from the authorities, and the KHRD captures their children as well as those who remained on the reserves. The excluded half-castes

camped near the reserves, supporting themselves largely by living off the country and handouts. It is possible that some infant births and deaths may have remained unregistered as people hid in the bush, but the deaths of older children outside the reserves were difficult to conceal. For the purposes of this study, the data stops at 1910. See Table 1.

When compared to the infant mortality for Victoria, Melbourne and Suburbs, the rest of Victoria and the LIH cohort, the KHRD infant survival is shown to have been better, but deteriorating by the turn of the century. Although the KHRD figures are small, by 1910, Aboriginal infant mortality was continuing to rise and had exceeded even Melbourne with its urban penalty. See Fig. 10.

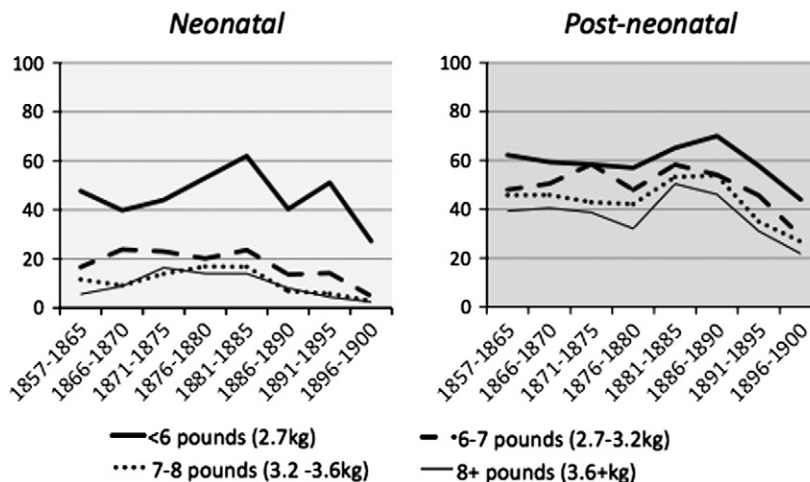


Fig. 5. LIH infant mortality by birth weight according to year of birth.

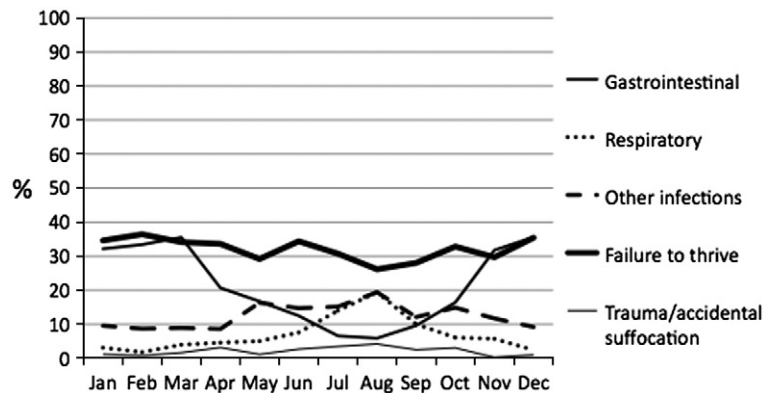


Fig. 6. LIH: causes of death by month of death.

5. Historical discussion

The health transitions of these two vulnerable populations in Victoria were distinctive and the embodiment of their respective historical experience. The richer data of the poor white population sample can provide context for the less detailed data that exists for the Aboriginal babies and their families.

The historiography of white infant mortality in Australia has focused on sanitation, the quality of milk supplies, allegations by the medical profession of maternal ignorance, the belated role of the organised infant welfare movement and the emerging understanding of the germ theory (Lewis 1992; Mein Smith 1997). Frontier societies created particular risks for mothers and babies: there was a dearth of grandmothers to pass on mothering skills; sanitation was primitive; hot summers, flies, and scant and polluted water supplies nourished gastrointestinal diseases; and financial insecurity and unstable personal relationships undermined domestic security. To contemporaries, it was puzzling that illness should be so prevalent and infant mortality

so high in a country where food was so cheap and the winters so mild. (*Australian Medical Journal*: 1858, pp. 119–39; 222–227; September 1876, pp. 257–307). Summer heat was an obvious culprit, as were the social casualties of frontier settler life: extra-nuptial pregnancies or imprudent marriages exposed women to bearing children without the support of either a reliable breadwinner or often an extended family (*Argus*, 25 February 1868). The Lying-In Hospital was established in 1856 precisely to serve women who faced motherhood without an adequate home and funds (McCalman 1999). The most powerful risk to infant life was having an unsupported mother, but those who were poorly supported, who struggled despite an irregular income, poor health and insanitary housing were also at risk. Infant mortality, as George Newman was to argue in 1906, was a social problem and a medical problem (Garrett, Galley, Shelton and Woods, 2006), and it ‘ran in families’ as much as it ‘ran in neighbourhoods’, as others have found in Sweden and The Netherlands in clusters of ‘high-risk’ families (Edvinsson, Brandstrom, Rogers and Brostrom, 2005; Van Poppel, Jonker and

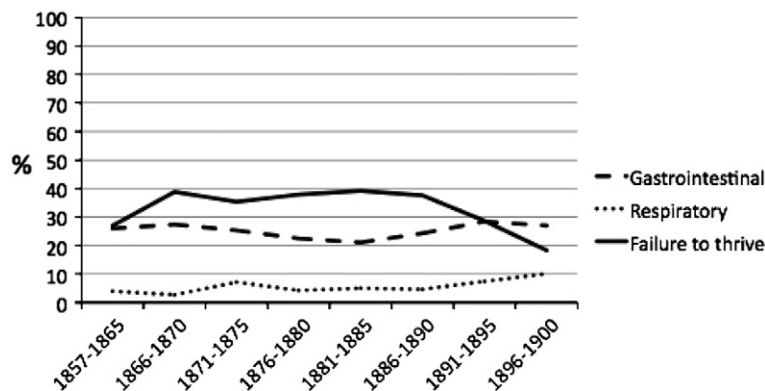


Fig. 7. LIH: percentage of infant deaths due to failure to thrive or gastrointestinal or respiratory causes, by year of birth.

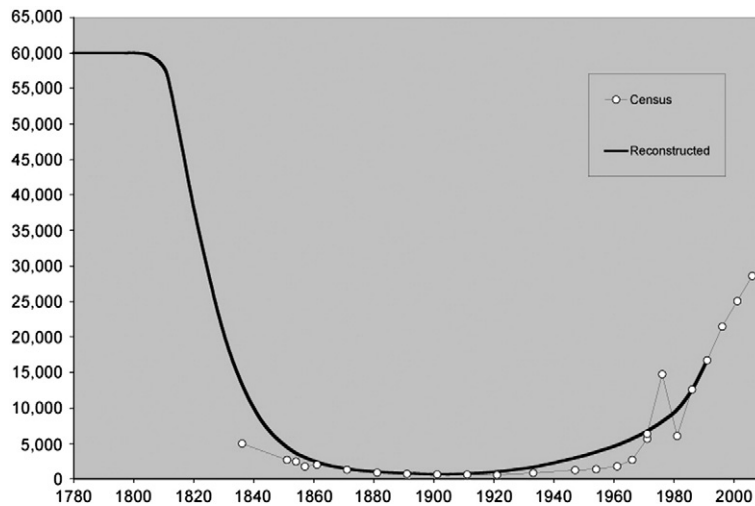


Fig. 8. Victorian Aboriginal Population 1780–2000.

Mandemakers, 2005). But the detailed LIH data reveal a darker story of unsupported women: unmarried, deserted or widowed, struggling to survive in a frontier society without traditional networks of community and kin. There are two critical questions in the LIH infant mortality figures: why was the rate so extreme, and why did it decline sharply after 1887, despite a savage depression that bore down particularly hard on the urban working class?

5.1. Poor white babies and the state

Women who were single, deserted or married to men who could not provide, had to find an income. Some returned to domestic service, especially if they worked in hotels, and some took housekeeping positions in the

bush where they could take their child. Paid work, unless it was in the home, was incompatible with extended breastfeeding. For most unsupported women, the Lying-In Hospital organised wet-nursing positions that necessitated the baby's being handed over to a carer to be dry-nursed. Among rough extended families, illegitimate babies were more easily incorporated into the household and reared successfully, although if the mother had to go out to work leaving the baby in the care of its grandmother, the baby would be at least partially weaned. Some prostitutes were well organised and cared for each other's children in the brothel: Catherine Agar in 1881 paid Maria Ritchie to care for her baby Louisa while she went out luring customers for 'bilking' (*Argus*, 14 September 1881). However, while Catherine was under arrest, little Louisa was fed on

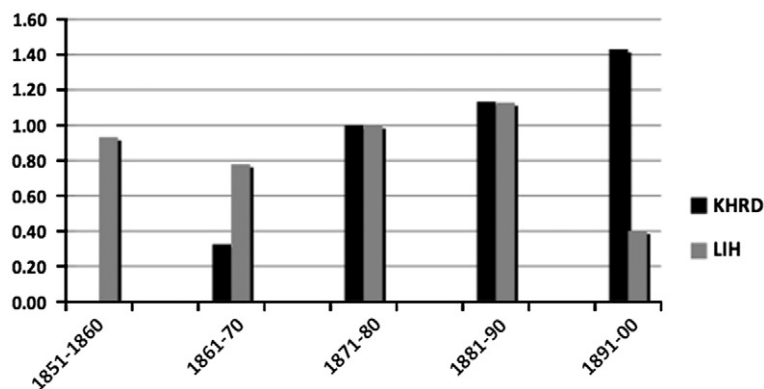


Fig. 9. KHRD and LIH: odds ratio for infant deaths, reference group 1871–80.

Table 1

KHRD Infant mortality by time, age and cause of death.

Birth decade	Year of death	Age at death years	Age at death weeks	Age at death days	Underlying causes of death	Duration
1850	1854	0	0	0	Pneumonia	
1860	1854	0	0	0	Pneumonia	1 month
	1863	0	0	0	Weakness from premature birth (not certified)	1 h
1870	1875	0	0	0	Consumption	
	1875	0	0	0	Scrofulous abscesses of the spine	
	1878	0	0	0	Hardening of the liver	
	1878	0	0	0	Haemorrhage of umbilical cord	
	1875	0	0	2	Premature birth	
	1875	0	0	2	Premature birth	2 days
	1875	0	2	0	Cold on chest	
	1875	0	3	0	Measles	
	1875	0	8	0	Wasted away	
	1873	0	15	0	Inflammation of the lungs	10 days
	1876	0	29	0	Convulsions (cause not certified)	
	1878	0	51	0	Convulsions	
	1877	0	52	0	Teething	
	1877	0	52	0	Low fever	
1880	1876	0	53	0	Ulcers	
	1885	0	0	1	Premature birth	
	1887	0	2	0	Bronchitis	
	1881	0	5	0	Inflammation of lungs	
	1887	0	13	0	Whooping cough	
	1887	0	15	0	Whooping cough	
	1883	0	16	0	Pneumonia	
	1881	0	24	0	Bronchitis	
1890	1882	0	51	0	Mesenteric disease	
	1892	0	0	0	Measles	
	1892	0	0	0	Heart failure	
	1893	0	2	0	Measles	3 weeks
	1898	0	5	0	Inanition (not certified)	
	1894	0	10	0	Bronchitis	16 days
	1893	0	13	0	Diarrhoea	
	1894	0	13	0	Bronchitis	
	1891	0	15	0	Weakness from birth	
	1892	0	18	0	Bronchitis	
	1894	0	19	0	Whooping cough	
	1892	0	21	0	Meningitis	
	1894	0	23	0	Bronchitis (not certified)	
	1893	0	29	0	Measles	3 weeks
1900	1893	0	29	0	Measles	3 weeks
	1893	0	37	0	Diarrhoea	
	1891	0	39	0	Influenza; broncho-pneumonia	1 week
	1903	0	1	1	Premature birth; debility	
	1903	0	0	1	Weakness	
	1903	0	4	2	Inanition; bronchitis [2 weeks]	
	1910	0	21	2	Inanition	
	1905	0	24	0	Diarrhoea	
1906	0	29	0	Whooping cough [2 weeks]; exhaustion		
	1909	0	35	0	Convulsions	

condensed milk and suddenly succumbed to convulsions at eight months. (PROV/VPRS 24 Inquest/1043, 15 September 1881). Those without supportive relatives or patrons (such as employers in hotels or homes)

employed private nurses or ‘baby farmers’ who clustered in the streets around the hospital. The fees ranged between 6 shillings and 12 shillings a week and nurses who took in multiple infants could earn a good

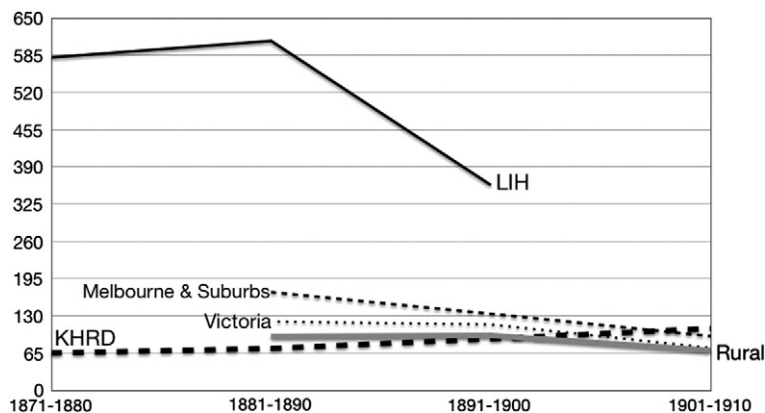


Fig. 10. Infant mortality 1871–1910 for KHRD, LIH cohort, Victoria, Melbourne and Suburbs and the rest of Victoria (Mein Smith (1997), p. 22; (Cumpston 1989) p. 115.

living. Most took in one or two at a time, and death rates were suspiciously high. By 1891, public concern at ‘baby farming’ led to the passing of Infant Life Protection legislation that coercively regulated the industry using both the agency of the police and the Children’s Hospital (Swain 2005).

The extreme infant mortality rate in the LIH data has been observed in other studies of foundlings and wet-nursing, but the detailed causes of death and the decline in mortality that began in 1887, provide some new perspectives. The decline started very precisely in 1887, when the hospital adopted antiseptic midwifery. The 1880s had been difficult years for the now over-crowded hospital, with high maternal mortality. The midwifery wards were fully or partially closed at different times, and married women sent out to be delivered by approved private midwives. The senior consultants were sceptical of Listerism however, and insisted that only a new building (or the admission of a higher class of patient) would reduce the mortality. In mid 1886, the resident medical officer in the Infirmary, John Dunbar Hooper, conducted a clinical case analysis of a hundred consecutive deliveries, carefully noting temperatures and all complications. Of the 100, 7 women died, 5 discharged themselves without permission, 6 were discharged as ‘convalescent’ and just 11 were discharged as ‘well’. 36 had serious post-partum infections. Hooper’s remedy was the antiseptic cleansing of patients, midwives, doctors and of all instruments; tracking of all interventions and the identity of the birth attendants; and greater honesty in diagnosis. The results were spectacular and the hospital’s maternal death rate fell away from 1887 (McCalman 1999) The simultaneous fall in the infant mortality rate, notably among neonates, suggests that the babies were benefitting from

having mothers in better health on discharge and more able to focus on their baby’s survival.

5.2. Failure to thrive/failure to care

But this is not sufficient to explain the continuing fall through the 1890s in post-neonatal births during the 1890s depression. (Neonate deaths rose again in the worst years of the economic crisis.) We suggest that the constellation of problems that resulted in a ‘failure to thrive’ opens a different epidemiological window. The Melbourne medical elite, in particular those connected with the Children’s Hospital in the 1880s and 1890s, and those who did autopsies for the coroner in Melbourne, were acutely interested in infant mortality, in particular the extreme mortality associated with illegitimacy and poverty. Nicholas Avent while resident medical officer at the Lying-In Hospital in 1871 had been horrified:

It is very well known for years, that infanticide, in various forms, is one of the permanent institutions of this metropolis. Every now and then an inquest lays bare the horrible system of child-murder, but the bulk of cases are unrecorded. A child is born in the Lying-in-Hospital, is taken out at the expiration of a fortnight, well and strong, and apparently destined for a long life. The mother is engaged as a wet nurse, the child is ‘farmed’. In two or three weeks it is brought back to the hospital for treatment, and, as a matter of course, no treatment, however judicious, can avail against the lethal influence of improper feeding, and the neglect of cleanliness and sufficient ventilation....It is next to impossible to fix upon anyone concerned, a criminal intention in its death.

The mother has regularly paid for its maintenance, and the ‘farmer’ is understood to have done her best to keep it alive. But the fact that the child was killed, is as well understood, as that the child was born. (*AMJ*, Oct. 1871, p. 311)

A foundling asylum was not established until 1877, but the death rate of those admitted without their mothers reached 80% until the practice of caring for unaccompanied babies was abandoned. (*AMJ*, May 20, 1894, p. 248) What Avent was describing was babies failing to thrive: in particular those dying after the neonatal period who could not be breastfed. In the LIH data failure to thrive did not vary seasonally in the same way as gastroenteritis. ‘Failure to thrive’ needs to be understood as a syndrome that was exacerbated by the absence of the baby’s mother or by her being disconnected emotionally. It was often babies who were difficult to feed—from immaturity, from sleepiness, from a poor sucking reflex, from an underlying condition such as a heart defect, from alcohol ingested from the mother’s milk or given as a sedative. Poor feeding on the breast reduced milk production, as would maternal dehydration in an urban environment where water and non-alcoholic drinks were in short supply in summer (McCalman 2005). Early weaning so that the baby could be passed into care dramatically raised the risk of infection from contaminated milk. And infection, especially repeated infection, can induce lactose intolerance and an inability to assimilate non-human milk (Walker-Smith & Walker, 2003). Finally, many of these babies were never wanted. Perhaps it was ‘for the best’ if the baby ‘faded away’: an age-old acceptance of ‘attenuated infanticide’ in the face of poverty and hopelessness. There is plenty of evidence of young women who cared for their babies; but there is also plenty of evidence of those who did not or who did not dare to invest emotion in an illegitimate child. In 1883, Dr Felix Meyer, in supporting Elizabeth Ann Fitzgerald’s charge of neglect against a private nurse, Mrs Agnew, commented: ‘The girl apparently cared far more for her infant than do the majority of unmarried mothers and left her situation to attend its last illness.’ (PROV/VPRS 24: Inquest 1883/1098) These were babies whose mothers or carers were unwilling or unable to commit to their survival.

The Melbourne doctors were early to accept the germ theory causation of gastroenteritis (Mein Smith 1997). R.R. Stawell’s landmark paper in 1895 ‘Some notes on the aetiology and pathological anatomy of summer diarrhoea in infants’ (Stawell 1895) called for a clear distinction between the genuine marasmus seen in cases

of emaciation caused by ‘First, want of breast milk, second exhaustion’ or ‘associated with congenital syphilis, and the large number of deaths caused by infections from contaminated milk, especially in the hotter months’. Likewise he dismissed ‘dentition/teething’ or ‘congestion/effusion of the brain’ as justifiable causes of death. Similarly convulsions, he associated with high fever and infection. The primary cause of diarrhoea, he argued, was artificial feeding and the causative agent was ‘toxicogenic bacteria’ of a number of distinct species that grew and multiplied in milk, but which produced similar symptoms, among them diarrhoea. Stawell’s paper was influential, but the fall in deaths from failure to thrive was already under way by the time he gave it in Melbourne. That the diagnosis of it continued to decline may stem from the changes in nosology, although the rise in diagnoses of gastroenteritis was considerably smaller than the fall in deaths from failure to thrive (Fig. 9). But it is also significant that before 1895, even if Stawell’s paper did affect his colleagues’ diagnoses of causes of death, it was principally a decline in death from failure to thrive that drove the fall in infant mortality in this special population. Something had changed in the way babies were cared for, in particular if they could not be breastfed.

As Shurlee Swain has shown, local and international outrage at the evil of baby farming spurred the colonial government to pass an Infant Life Protection Act in 1891 that was put into force in January 1893 (Swain 2005). The act transferred the authority for registering houses where infants were nursed or maintained for more than three days, or for the purpose of adoption, from the Board of Health to the Police. No woman, other than a baby’s mother, could care for a baby for longer than three days without a licence, and that licence had to be renewed annually. This bore down particularly hard on grandmothers and other female relatives who had cared for unmarried or unwell mothers’ babies from time immemorial. Every baby that died in the care of others, even blood relatives, had to have a coronial inquiry and autopsy.

The Police were required to inspect the houses of registered nurses for cleanliness and compliance every three weeks. They protested that women were now deterred from putting their babies into care lest their ‘shame’ be investigated by the authorities and warned that the less savory baby carers would become even more surreptitious. The police were not welcome and always took another sergeant for safety’s sake when inspecting houses in Carlton (Wilson 2006). The coroner routinely checked on whether the official

feeding instructions provided by the Children's Hospital were pinned up in a prominent position in the kitchen or scullery.

These feeding instructions were the most important element of what was nothing less than a systematic assault on infant care and domestic hygiene among working-class women. In July 1893, Jeffreys Wood, the HMO at the Children's Hospital published a paper on the composition of human milk compared with artificial feeding, and the measures needed to make non-human milk an adequate and safe alternative (Wood 1893). The medical community in Melbourne saw artificial feeding as their professional responsibility. They recognised that cow's milk was indigestible for many babies: their digestions could not assimilate the large protein curds and Dr JW Barrett had led experiments in the Medical Society of Victoria into the composition of human and bovine milk (Barrett 1894). But Wood was also concerned with the differing fat composition of human milk compared to skim cow's milk or in the growing number of proprietary infant formulas in the marketplace: condensed milk, Nestlé's, Mellin's, Savory & Moore's, Carnick's. He argued that rickets was more prevalent with artificial feeding because of the loss of cream; and he had experimented with methods of breaking down the curds in cow's milk with water and barley water, then adding cream to make up the nutritional deficiency. Feeding instructions based on Wood's research were then made compulsory for registered nurses to memorise and display prominently in their homes. The coroner would question the nurse or relative who was in charge of the baby as to whether the instructions were understood and prominently displayed. More importantly, familiarity with the instructions was necessary for the annual licensing from the police, and since baby-minding was one of the few ways that house-bound working-class women could earn extra money other than 'sweated' outwork in the clothing trades, there was a high incentive to learn the regulations. It is not hard to imagine how 'the knowledge' was passed from neighbour to neighbour in the inner suburbs, as the hundreds of would-be nurses sought registration.

Coronial inquests must have been terrifying ordeals for many, risking public humiliation and even possible criminal charges. Under examination from the coroner, the nurses declared infants who died as emaciated, excoriated bags of tiny bones, to be 'perfectly well' the day before. They told how they had always used the best cow at the local dairy; how they had followed the instructions; and especially how they had repeatedly taken ailing babies to the Children's Hospital out-

patients—at least to cover themselves if not to help the baby. However this was integrating into working-class culture a readiness to seek medical attention.

In 1891, Dr Constance Stone had personally pursued a notorious baby farmer, Alice Palmington, and when she rescued baby Whiteway he was 'clothed in dirty rags' and 'appeared to have starved' (PROV/VPRS 24: Inquest 1891/1531). A decade later, an illiterate registered nurse Mrs Jane Bennett testified to how she cared for a 'nice little baby' with congenital syphilis: she tried to persuade the mother to resume breastfeeding, she fed the baby with milk from a good dairy which she diluted with lime water, she gave castor oil for diarrhoea, treated the baby's thrush with glycerine and borax and took him to the doctor every day. The coroner noted that despite the congenital syphilis, the baby was 'well nourished'. Mrs Bennett, even if illiterate, had done well because she knew more, had access to medical advice and was conscientious (PROV/VPRS 24: Inquest 1901/396).

In all, the administration of the Infant Life Protection Act after 1893 constituted a major intervention by doctors in the infant care of the city's most vulnerable new inhabitants. Under the Act the nurses were a captive, regulated and recorded experimental population in the coercive application of existing medical knowledge, backed by the full force of the law—the police and the courts. These were carers who were forced to care.

5.3. *Aboriginal babies and the state*

As we have described elsewhere, Aboriginal Victorians suffered what was arguably the most rapid and catastrophic colonial dispossessions of the nineteenth century (Smith et al. 2008; McCalman et al. 2009). The colonial state had been quick, however, to institute administrative control of Aboriginal people, with a protectorate established in 1838, just three years after permanent white settlement, and a Protection Act and a Board in 1861. In the 1870s around half the known population were collected on to reserves to protect them from the violence and sexual predations of the settlers. That 'protected' population was saved, while those who remained outside appear to have left almost no descendants and were either killed or died isolated from kin and community. For just over a decade, conditions on at least some of the reserves were supportive, and the Aboriginal population began to grow again, in particular as women had relationships with white men. For the Board, however, this meant that the cost of maintenance was growing instead of declining in concert with the 'fading away of the

race'. In 1886, the Half-Castes Act sought to force all those who were of part-descent to leave the protection of the reserves once they reached the age of eighteen, even though their kin and community remained on the reserves. The intention was to break the connections between the generations, but most of the exiles stayed near the reserves, living in shanties just far enough away to be safe from the authorities, and just close enough to maintain some connection with their families and community. Officially, these 'half-castes' were now 'white' except that in everyone's eyes they remained 'black' and they entered an administrative limbo where their whiteness denied them support from the Board and their blackness denied them economic and social equality. By 1890, four years after the act, around 200 of the 600 people who were known to the Board, were living outside the reserves, but even in the small figures we have in the KHRD, we can see the effects of this dislocation and enforced isolation.

Louisa Briggs (~1836–1925) lived this history. The family of John and Louisa Strugnell Briggs was first documented in Diane Barwick's moving biography: 'This most resolute lady' (Barwick 1985b). Anthropologists have long documented the genealogical architecture of Aboriginal families, however these abstracted summaries of family relationships were employed as tools in understanding kinship relationships within and across generations as well as mapping relationships between kin and country. An anthropological interest in Aboriginal biography and the historically textured lives of Aboriginal families did not emerge until relatively late, and the social histories produced by Diane Barwick, were both seminal and germane to the context of this study. (Barwick 1962; Barwick 1972; Barwick 1985b; Barwick 1988) Barwick was interested in the contemporary lives of Aboriginal people in Melbourne and rural Victoria during the 1960s and 1970s. But she also charted the lives of some of the pivotal ancestors of this community, who survived the social cataclysm during the nineteenth century that had resulted in the irrevocable loss of a traditional hunter-gatherer clan-centred way of life, cause a precipitous decline in population and progressively incorporate Aboriginal peoples within the administrative structures of a settler-colonial state.

John and Louisa Briggs had grown up in the sealing community in the Bass Straits that had come into being following the first sealing expedition of the *Nautilus* to Kent Island group in 1798 (Barwick 1985b; Plomley 1990). After nearly a decade the larger intermittent sealing operations had become unviable as a result of the depletion of the seal population. Over the next half

century the industry consisted of independent sealers who lived across the Bass Straits in a marginal economy based on products from a remnant seal population, along with Aboriginal women obtained through various means from northern Tasmania and southern Victoria. Louisa was a Boon Wurrung woman whose country was the western region of Port Philip Bay. John's mother, Woretotemotetyenner, an Aboriginal woman from Cape Portland in Tasmania, spent most of her adult life in the Bass Straits, with a brief sojourn in Mauritius before returning to spend her final years in Tasmania in the care of the family of his older sister Dalrymple, 'Dolly' Johnson (Ryan 1975; Mollison and Everitt, 1978; Plomley 1987; Plomley and Henley, 1990).

John and Louisa left the islands for Victoria some time around 1853 to seek opportunities in the Victorian goldfields. Yet by the time that the young Briggs family decided to take their chances in this booming frontier society, official estimates placed the remnant Aboriginal population at 1907 people Smith et al. (2008). This is a precipitous decline in what archaeological investigations have demonstrated to have been the most densely populated region of Australian continent prior to the establishment of the Botany Bay penal colony in 1788. The intensification of an earlier hunter-gather economy over the late Holocene led to the creation of a semi-sedentary society along the Murray River and the basalt plain in western Victoria. Since 1788, however, the Aboriginal population in the southeast had been savaged by at least two major small pox epidemics—reducing an estimated original population of 60,000 to a mere 15,000 by the time the colony of Port Philip was established in 1835. The influx of colonists—half a million in the gold rush decade alone—along with their millions of grazing animals was a social and ecological disaster for Aboriginal people.

John and Louisa and their growing family were able to find work at the social margins of the booming economy and John worked for most of the decade of the 1860s as a shepherd in the Beaufort district in western Victoria. Over these years their family grew to nine children (three sons and six daughters) adding to another child born to John through another relationship. They had been relatively fortunate compared with other Aboriginal families, with all but one of their children surviving child hood. However, by 1871, they were destitute and their social and economic independence came to an end when they were admitted by the permission of the secretary to the colonial Board for the Protection of the Aborigines, Robert Brough Smyth, to the relatively new Aboriginal reserve of Coranderrk around 50 km east of Melbourne (Barwick 1985b).

The Aboriginal reserves (or missions) were government and church administered settlements that had been established from 1851 in the wake of the policy failure of the Port Philip Protectorate. The first of these was the short-lived Aboriginal mission established by Moravian missionaries at Lake Boga in the north of the colony near the Murray River. By 1863 seven reserves had been established with about 23 smaller camps or depot stations. Most were smaller than 1000 ha in size—making it difficult for them to be self-sufficient although at different times some were economically productive. The reserves had diverse histories and various periods of establishment. Some were government administered, but Christian groups with government subsidies administered a number (Broome 2005). According to Broome: ‘All reserves started in a rudimentary way, the people living in traditional ‘miams’ or bark shelters until they were willing to leave them, or until bark and slab huts could be built, followed by farm buildings, schools, boarding houses and churches’ (p. 132).

The reserves were to become increasingly central to Aboriginal lives over the final decades of the nineteenth century. However, under the 1869 *Aborigines Protection Act* the regulation of this system was tightened. The *Board for Protection of Aborigines*, established by the act, controlled the distribution of Aboriginal welfare through a rations system and also had powers in relation to Aboriginal employment and the residence and care of Aboriginal children. The circumstances that brought Aboriginal people into the reserve system varied. Economic factors were an important impetus for many families such as the Briggs. Kinship was another factor in decisions by Aboriginal families to move in and out of the reserve system. Reserve managers were able to also exercise varying degrees of moral persuasion—supported in some circumstances by the law—in order to bring Aboriginal people within their jurisdiction. The lack of opportunity for paid work also meant that Aboriginal people left behind family for varying periods of time to work as stockmen and agricultural labourers, or in domestic service. Louisa Briggs was in time paid to act as matron and midwife at Coranderrk.

However, with the 1886 Half-Castes Act, Louisa Briggs, despite her paid position as on the station, was exiled with her sons from Coranderrk and found refuge in Maloga mission in New South Wales. In 1889 they moved to Cumeroogunga reserve on the New South Wales side of the Murray River. When Louisa pleaded to return to Coranderrk she was refused on the grounds that she was ‘Tasmanian’. Another application was denied in 1892. In 1895 half-castes were expelled from Cumeroogunga and her family were forced to camp at

Barmah. In 1903, aged sixty-seven, Louisa Briggs requested the rations ‘to which she was entitled by age and ancestry’. Again she was refused. She died in 1925, revered as a warm, devout, strong-minded, hard-working and humorous mother of her people (Barwick, 2005).

As with the poor whites, we probably have some under-registration of infant deaths, except that during the 1870s and most of the 1880s, Aboriginal mothers and babies were under the Board’s surveillance. It is more likely that babies died unregistered in the 1890s, yet there is a rise in deaths during that time, just as white infant mortality began to fall. What is clear is that the patterns of Aboriginal infant mortality during the period of this study were socially framed by a period in which Aboriginal lives were consolidated within the social structure of the missions and reserves. Then this consolidation was reversed as a consequence of a new legislative framework that redefined Aboriginality and the entitlements of Aboriginal people. The economic pressures that gave rise to this hardening of colonial administration were to also have health consequence for those Aboriginal people expelled from the reserve system into a social world in which they were socially and economically marginalised.

What is equally striking from this comparative study is not only the opposite trends in infant mortality with the Aboriginal trend defying the more standard narrative regarding the epidemiological transition—but the different patterns of mortality. Gastrointestinal disease was less common; death from infections caught from sick adults and older children exposed to epidemic waves of influenza, whooping cough and other respiratory infections were prominent. Neonatal deaths were related to prematurity, so it would appear that the Aboriginal babies were protected by universal breastfeeding on the reserves, by the community networks of support and by being out in the country. Aboriginal mothers, unlike the unsupported ‘poor white’ mothers at the Lying-In Hospital, did not have to go out to work for a living. Once outside the reserves, however, young mothers in particular were more vulnerable, cut off from daily contact with their own mothers and supporting kin. The intention of the Half-Castes Act was to break the relationships between generations, to force those of part-descent into white society. The effect was to break their hearts and thrust them into a society that would not permit them to take jobs, obtain housing and receive the government entitlements that were notionally theirs under the law (Smith et al. 2008).

We still know very little about how those living outside the reserves were obtaining food. There is

evidence of starving people coming back for temporary rationing or when they were ill, but we do not know if they attempted to return to living off the land, difficult as that was by the 1890s in the settled districts. What the expulsion from the reserves meant, however, is that they were to be even further marginalised and removed from any benefits of medical advance or state regulation of infant care, apart from children being removed from their parents and institutionalised in the industrial schools. As the poor whites, through the agency of the charity hospitals for women and children, were beginning to benefit from modernity, Aboriginal Victorians were cast into the ‘invisibility’ of people who were not meant to be there. Their alienation and humiliation compounded over time. And that was manifest in their increasing morbidity and mortality—in infancy, childhood and early adulthood—just as poor whites began their health transition (McCalman et al. 2009). We suggest that these contrasting fates provide a glimpse of the formation, by government policy, of the shameful ‘gap’ between Indigenous and non-Indigenous health and wellbeing that remains to this day.

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