‘A pestilence stalks abroad’: familial clustering of deaths during the Tasmanian scarlet fever, measles and influenza epidemics of 1852–54

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Abstract

At the time the first colonists arrived in Tasmania in 1803, the island was almost certainly free of infectious disease. Eventually, however, all the ‘stock diseases’ were to make their appearance. In 1852–54, Tasmania suffered concurrent epidemics of scarlet fever, measles and influenza. In 1853, 493 of 1,992 total deaths were attributed to one of these diseases; mortality of children aged 1–4 and 10–14 tripled, while mortality of children aged 5–9 years increased five-fold. This paper considers age-sex patterns of cause-specific mortality in Tasmania in 1852–54, and how mortality in these years differed from that of non-epidemic years. The paper also investigates whether deaths were more likely to cluster within families during these epidemic years compared with non-epidemic years. This study is based on family reconstitutions derived from a complete dataset of births, deaths and marriages registered in nineteenth-century Tasmania.

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Introduction

At the time the first colonists arrived in Tasmania in 1803, the island was almost certainly free of infectious disease. The indigenous inhabitants’ nomadic lifestyle, isolation and low population density precluded the possibility of communicable diseases (Goldsmid 1988; Cumpston 1989). The infectious diseases suffered by the Tasmanian colonists were all imported, either from neighbouring colonies or from countries overseas. Although some diseases, such as typhus and typhoid, seem to have arrived with the first settlers, Tasmania remained free of a number of infectious diseases, endemic in England, for several decades after colonisation. Charles Rowcroft (1843), who lived in Tasmania in the 1820s, noted that the ‘stock diseases’, including measles, whooping cough, and scarlet fever, did not exist in Tasmania. Eventually, however, all the ‘stock diseases’ were to make their appearance.

This paper discusses epidemics of scarlet fever, measles and influenza that occurred in Tasmania in the period 1852–54. During this period mortality rose by 80 per cent. At some ages, mortality increased five-fold. The first two sections below give a brief history of Tasmania’s European population and describe the data source for this study. Then the incidence of scarlet fever, measles and influenza mortality in Tasmania over the course of the nineteenth century and over the period 1852–54 is discussed. The next section details age-specific death rates during the epidemic period in comparison with non-epidemic years. Finally, clustering of deaths within families is considered.

A brief history of Tasmania

The island of Tasmania lies approximately 250 kilometres off the southeast coast of mainland Australia. In area it is slighter smaller than Ireland, with average maximum temperatures in the capital of Hobart of around 22°C (71°F) in January and 12°C (53°F) in July. In 1642, the Dutch explorer, Abel Tasman, became the first European to reach Tasmania. He named the island ‘Van Diemen’s Land’ in honour of his patron, Anthony Van Diemen.

In 1788, Britain established a penal colony on the Australian mainland at Sydney, New South Wales and, 15 years later, another penal settlement at Hobart Town (later contracted to Hobarton and then to Hobart) in Van Diemen's Land. Over the next 20 years, the European population of the island grew to 10,000, more than half of whom were convicts. The colony of Van Diemen's Land was administered locally by a succession of Lieutenant-Governors who took their orders from London.

Over this same 20-year period, the indigenous population of the island, estimated as originally numbering around 5,000, was drastically reduced by European violence and introduced disease. By 1830, there were fewer than 250 of the original inhabitants remaining.

In the early 1850s the free and convict population numbered around 50,000 and 20,000 respectively. Transportation of convicts to the colony ceased in 1853, as a result of increasing local opposition and the discovery of gold in the neighbouring colony of Victoria (Brand 1990). Representative government was introduced in 1856, along with a name change from 'Van Diemen's Land' to 'Tasmania' (after Abel Tasman), designed to rid the colony of any stigma attached to its former condition as a penal settlement.

Data

Data for this research are derived from the birth, death and marriage registers for nineteenth-century Tasmania. Civil registration began in Tasmania in 1838, one year after its introduction in Britain, at the behest of Lieutenant-Governor John Franklin. Franklin appreciated the administrative utility of registration, but also believed that future generations would benefit from 'much interesting information' derived from the registers (Kippen 2002).

The colony was divided into registration districts. Each district was administered by a deputy registrar who informed himself of births, deaths and marriages of the free population[1] occurring in his district, and recorded the particulars in register books. Every quarter the registrar—and clergy who had performed marriages—sent copies of their registers to the central office in Hobart (Kippen 2002).

The nineteenth-century registers are now held by the Archives Office of Tasmania, which made them publicly available on microfilm in 1983. In the 1990s and 2000s, a series of grants from the Australian Research Council allowed full transcription of these microfilmed registers into a database. This database contains registration information for approximately 93,000 deaths, 195,000 births and 51,000 marriages, occurring over the period 1838–99, and is available through the Australian Social Science Data Archive (Gunn and Kippen 2008).

[1] Separate registers were kept for the convict population.

Information collected in the birth registers includes name and sex of the newborn; date and place of birth; date and district of registration; name of mother and father; maiden name of mother; occupation of father; and name, description and residence of the informant.

The marriage registers record name, age, occupation and previous marital status of the bride and groom; date and place of marriage; date and district of registration; name of the officiating clergyman; and religious rites used.

Information collected in the death registers includes name, age, sex and occupation of the deceased; date and cause of death; date and district of registration; and name, description and residence of the informant. Table 1 shows selected variables (name, age, sex, occupation, date and cause of death, and informant's name and description) in the transcribed death register for the Longford district, July to December 1853.

Causes of death have been classified according to a system based on William Farr's nineteenth-century nosology and the modern International Classification of Diseases. Family reconstitution from the birth, death and marriage registers is currently underway.

Disease background

As noted in the introduction, Tasmania was free of a number of infectious diseases for several decades after colonisation. Eventually however, Tasmania experienced regular occurrences of diseases such as diphtheria, whooping cough, scarlet fever, measles and influenza. Figure 1 sets out monthly deaths attributed to scarlet fever, measles and influenza over the period 1840–99 in Tasmania. These three diseases are discussed below.

Scarlet fever

Scarlet fever is a highly contagious childhood disease caused by streptococcus with symptoms of high fever, sore throat, 'strawberry tongue', a diffuse scarlet rash most noticeable on the trunk, and, in very young children, convulsions. The disease is spread by droplet infection and contaminated food, such as milk. The period of incubation varies from one day to a week, and the onset of disease is accompanied by a rapid rise in temperature, shivering, vomiting, headache, sore throat and rapid pulse. The rash appears within 24 hours and begins to fade after two days. Complications can include nephritis leading to uraemic poisoning or Bright's disease, and endocarditis (Thomson 1978; Government of Victoria 1997).

Deaths from scarlet fever in nineteenth-century Tasmania were associated with a global upswing in virulence of this disease from the 1820s to the 1870s (Swedland and Donta 2003). Figure 1 shows that scarlet-fever epidemics occurred in Tasmania in 1843, 1852–54 and 1875–77.

In 1843, ‘no part of the island escaped its visitation’ (Hall 1867). Although only 38 deaths from the disease were recorded in the registers, a local doctor reported that 43 deaths took place in the Hobart district alone, and ‘many more subsequently from dropsy, marasmus and other sequelae of this exanthematous fever’. A decade later, ‘another epidemic visitation scourged the whole colony’ (Hall 1867).

The 1875–77 epidemic followed a severe outbreak of the disease in England and Wales in 1874 (Loudon 1987) and coincided with a global spike in puerperal fever, attributed to a ‘simultaneous world-wide change in streptococcal virulence’ (Loudon 1992).

Measles

Measles is a highly infectious disease spread by droplets from the nose and throat. Its spread is facilitated by the fact that the carrier is infectious during the 7–10 day incubation period. Initial symptoms include fever, sneezing, watery nasal discharge, cough, headache, rapid pulse and red, watering eyes. The characteristic red rash appears around four days after the onset of symptoms and begins to subside after another 2–3 days. Deaths from measles are often caused by respiratory complications, such as pneumonia, to which young children are particularly vulnerable (Thomson 1978; Government of Victoria 1997).

Measles mortality in nineteenth-century Tasmania exhibited the classic periodicity seen in small isolated populations, with large numbers of deaths roughly every six years, and virtually no deaths in the intervening periods (Figure 1). The 1854 measles epidemic was the colony’s first, although there had been occasional earlier cases of the disease (Cumpston 1989).

Influenza

Influenza is a viral infection characterised by fever, headache, muscular aches, chills, respiratory inflammation and prostration. The disease is primarily spread by airborne droplet infection. It has an incubation period of 2–3 days followed by illness for 2–4 days. Weakness and depression can continue for prolonged periods after the illness has passed. The influenza virus can mutate frequently, meaning that one bout does not confer immunity. Complicating pulmonary infections and cardiac problems can prove serious, especially for the elderly (Thomson 1978; Government of Victoria 1997).

The peaks in Tasmanian deaths from influenza in 1852–53 and 1891 occurred as part of global influenza pandemics (Taubenberger et al. 2007). The 1860 epidemic was localised to Australasian colonies (Lucas 1997).

Diary of an epidemic

The year 1851 was free of epidemics in Tasmania, although there were five deaths attributed to scarlet fever in Hobart. In 1852, there were a small number of deaths ascribed to scarlet fever each month, totalling 35 over the year (Figure 2), with all but four occurring in Hobart.

In November and December 1852 a severe influenza epidemic hit the island. A local newspaper noted: 'The INFLUENZA still continues its ravages; for the past week, the passing knell of St. David's Cathedral has continually been tolling' (*The Courier* 24/11/1852). Influenza deaths abated in January and February 1853 but rose again from March, peaking in May and then declining through the rest of the year (Figure 2).

Deaths from scarlet fever suddenly increased in May 1853 and remained high for the next year (Figure 2). The source of the epidemic has not been pinpointed. However it may have been a consequence of high migration to the neighbouring colony of Victoria—in the throes of a major gold rush—and faster voyages. The trip from England to the colonies now took three months, less than half the time of earlier voyages. The swifter ships had more family groups with young children on board, meaning a greater reservoir for childhood epidemic disease, and a greater likelihood that such disease would not burn out before voyage's end. One suspect for the origin of the scarlet fever epidemic is the *Ticonderoga*, which landed near Melbourne in November 1852. Out of 800 passengers there were more than 100 deaths, and more than 300 cases of scarlet fever and typhus still on board when the ship docked (*Colonial Times* 19/11/1852; Kociumbus 1997).

More than 600 deaths over the period 1852–54 in Tasmania were attributed to scarlet fever. Many families suffered more than one death from the disease. It proved fatal to all five children of the Mitson family; four died on consecutive days. William and Mary Appleby lost four of their five children—aged two to nine years—to scarlet fever. The only survivor, William Henry, age six years, grew up to have 14 children of his own.

In line with the prevailing wisdom that such disease was caused by miasma—a toxic atmosphere arising from putrescence and filth—the enormous death toll sparked local editorials scathing of the state of the streets. The *Tasmanian Colonist* (16/5/1853) warned:

> While sickness is so prevalent, some speedy steps ought to be taken for rendering the streets as clean and wholesome as possible. In the different lanes and alleys, more particularly, heaps of dirt and filth are accumulating, which with the pools and gutters of stagnant water, are enough to breed a pestilence more fatal than that which now stalks abroad.

The Courier (23/6/1853) noted in an article titled 'Drainage of the city':

> No one recollects in Van Diemen's Land, and specially in Hobart Town, so sickly a season as the present. Not only has the usual complaint of influenza manifested itself with special force, but, superadded to that, we have to record a large number of deaths from scarlatina and scarlet fever…Precisely in those parts of the town which are most characterised by open drains and filthy standing pools, and heaped-up abominations, has disease and death impended and been

active…Can we, with these facts staring us in the face, be surprised at the prevalence of influenza and of malignant fever?…The air is corrupted, and the atmosphere charged with *virus* originating from the immediate neighbourhood of putrid substances, abundant enough to generate poison for a city ten times as large as the one we inhabit!…Let our readers feel assured that epidemic disease will never cease to rage amongst us, and carry off our children, until Hobart Town is thoroughly drained and sewered, and supplied with water in copious and cleansing streams.

The presiding Lieutenant-Governor—Sir William Denison—authored a paper on 'drainage and sewerage of towns, with special relation to the late epidemics in Hobart Town and Launceston' (Denison 1854) which also argued that epidemic fever would only be eliminated with a proper system of drainage.

Some members of the Legislative Council attempted to blame the epidemic on the importation of inferior American flour, the argument being that children were most affected by scarlet fever, and bread made from American flour formed the principal part of children's diet (*The Courier* 7/10/1853). However this supposition was widely mocked by the public in letters to the press:

How great will be the astonishment of Europe at this wonderful Tasmanian discovery of the latent cause of measles, scarlet fever, cholera, and other ills that flesh is heir to! O! Mirabile dictu! Pandora's box is a Yankee barrel! (*The Courier* 25/10/1853).

Purveyors of quack medicine took advantage of the epidemic to advertise their wares:

The dreadful ravages of the Scarlet Fever. Death is stalking abroad almost in every family. Then why not try Morison's Pills? The undersigned is not aware of any family suffering who has made use of Morison's Pills as a family medicine. It is worth a trial. R. Drury, Agent. (*Colonial Times* 29/11/1853)

A local doctor, against the accepted understanding of the time, stated that 'scarlet fever does not arise from poverty of living, like typhus fever; nor from ill-drained dwellings and filth, as common fever does—it requires its peculiar germ, or poison, whatever that may be' (Bedford 1854). It was to be several more years before this idea of the specificity of infectious disease became widely accepted. This doctor attributed the severity of the epidemic to two causes:

In England the disease is always present, a number each year being the subjects of its attack while in a mild form, and therefore not victims to the severer epidemic visitations. In new countries, the poison, not so large in quantity, does not act so constantly; this, with the less dense population, causes fewer to be affected with fever in the intervals between the epidemic visitations. The other cause I believe to be, that a larger number of children attain in this country to fourteen years of age than in Europe; but many of them are not robust, or fitted to bear a severe disease (Bedford 1854).

Although scarlet fever began in the town of Hobart, it eventually spread to all inhabited parts of the island. The 1854 death register for the rural district of Longford (Table 1) tells a stark story. From July to September there were four or five deaths registered each month. None were attributed to scarlet fever. In the last quarter of the year, 15 of 24 deaths were ascribed to scarlet fever, eight to children in three families.

The scarlet fever epidemic was bookended by an outbreak of influenza in 1852 and an outbreak of measles in 1854 (Figure 2). The measles carried off more than 100 children, several of whom had lost siblings in the scarlet fever epidemic. More than 900 deaths out of a total of 5,283 over the period 1852–54 were registered as being from scarlet fever, influenza or measles. However, as discussed in the next section, the actual toll from these diseases was likely to have been much higher.

Age-specific death rates

Figure 3 shows the age distribution of deaths attributed to scarlet fever, measles or influenza in Tasmania, 1852–54. Mortality from each disease exhibited a distinctive age pattern. Scarlet fever was most fatal at 1–3 years, with 36 per cent of deaths occurring at these ages. The proportion of deaths gradually declines at each successive age thereafter. In total, 92 per cent of deaths occurred to children aged under 15 years.

Measles deaths were more heavily concentrated at younger ages, with one-third of deaths at age one, and half under the age of two years. Influenza deaths peaked at age zero. However half of all influenza deaths occurred at ages 15 years and over, with a relatively high proportion of deaths at older ages.

The scarlet fever, measles and influenza epidemics significantly increased mortality across the age range. Figures 4–8 show annual age-sex-specific death rates for Tasmania, 1845–99. The highest rates by far were during this epidemic period. Infant mortality increased by more than half, mortality of children aged 1–4 and 10–14 years tripled, while mortality of children aged 5–9 years increased five-fold. Adult mortality more than doubled. Over the years 1852, 1853 and 1854 there were almost 2,400 excess deaths out of 5,283 total deaths and an average population of 57,000. However only 915 deaths were recorded as being from scarlet fever, measles or influenza.

It is clear from examining the death registers that many deaths from one of these three diseases were attributed to sequelae such as ‘Effusion on the brain’ or ‘Inflammation of the lungs’, or other causes including ‘Croup’ and ‘Teething’. This is especially evident in cases where, for example, a child dies of ‘Inflammation of the lungs’ and his siblings succumb to ‘Scarlet fever’ less than a week later.

Taking into account the excess mortality and deaths registered from other causes, the 1852–54 epidemics of influenza, scarlet fever and measles probably killed one in 15 children aged under ten years.

Familial clustering of deaths

In non-epidemic years, it would be expected that some families would lose more than one member within a short space of time, through,

(1) accident;

(2) death of mother and child soon after childbirth;

(3) death of newborn twins; or

(4) other causes or coincidence.

For example, in 1855–57, the three years after the epidemic period discussed above,

(1) brother and sister Charles and Selina Hillier Barnett died on the same day from eating phosphorus;

(2) Sarah Bayes died two days after giving birth, her newborn daughter died 11 days later;

(3) the Hamilton twins did not survive the day of their birth; and

(4) Ann Gee succumbed to 'General debility' while her husband of 18 years died of the same cause ten weeks later.

Epidemic years would see these types of deaths in addition to possible clustering of epidemic deaths within families. As noted above, during 1852–54 many Tasmanian families lost more than one child to scarlet fever.

This section compares familial deaths occurring in Tasmania within six months of each other in 1852–54 and 1855–57, to determine whether familial clustering was more likely during the earlier epidemic period. The average population during the two periods was 57,000 and 70,000 respectively, while the total number of recorded deaths were 5,283 and 4,276.

Familial deaths are defined dyadically as parent–child, sibling–sibling, or husband–wife deaths. In total, 627 such deaths—in 288 families—occurred in 1852–54, and 154 deaths in 75 families in 1855–57. These deaths, and the relationship of family members who died, are set out in Table 2. To encompass all the observed familial deaths, deaths are classified as mother and newborn dying within six weeks after birth; other mother and child deaths; father and child deaths; twins dying within six weeks of birth; two, three, four, and five sibling deaths; spousal deaths; or one or both parents with two or more child deaths.

It is clear from the total number of familial deaths in each period that clustering of deaths within families was much greater during the epidemic years of 1852–54 than in the three subsequent years. Four times as many familial deaths occurred within six months during the earlier period, although the total number of deaths was only 24 per cent higher than during 1855–57. Twelve per cent of all

deaths in 1852–54 were to family members dying within six months, compared to four per cent in 1855–57—a significant difference.

The number of deaths was greater in each relationship category in 1852–54 than in 1855–57, with the exception of twins dying soon after birth (Table 2). The percentage distribution in Table 2 shows that familial deaths during the epidemic years were heavily concentrated in the sibling categories. Fifty-eight per cent of the families experiencing familial death in 1852–54 lost two or more siblings (excluding the twin category), compared with 29 per cent in 1855–57.

Figure 9 shows the percentage distribution of the time between familial deaths in 1852–54, given that the deaths occurred within six months of each other. As might be expected, deaths clustered within families also clustered in time. Thirty per cent of family deaths occurred in the same week, while just over half happened within three weeks, and two-thirds within six weeks. The remaining one-third were fairly evenly distributed throughout the remainder of the six-month period.

Conclusion

Over the period 1852–54, the free European population of Tasmania experienced its highest mortality ever, with death rates 80 per cent above the average, and increases in mortality at every age. This was the result of severe epidemics of influenza, scarlet fever and measles. Although influenza had made regular appearances since colonisation in 1803, this was only the second epidemic of scarlet fever, and the first of measles to occur on the island.

As noted by local doctor Bedford, such diseases were ‘always present’ in England, and severe visitations could not affect people who had already experienced milder forms, thus limiting epidemic impact. However in Tasmania, the epidemics of measles and scarlet fever were visited on a population of native-born children, none of whom had previously been exposed to either disease.

In addition to sharp increases in death rates, the epidemics resulted in clustering of deaths within families, with many parents losing two, three, or more children to influenza, scarlet fever or measles.

Acknowledgements

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Table 1. Transcribed death register, Longford, Tasmania, July – December 1853. Age: first two digits after the decimal point represent months, next two represent days.

Date of death			Name							Informant		
Day	Month	Year	First	Middle	Last	Sex	Age	Rank or profession	Cause of death	First	Last	Description
3	7	1853	John		Strickland	Male	0.0107	Labourers child	Influenza	Thomas	Humphreys	
6	7	1853	John		Carmody	Male	3	Licensed Victuallers Child	Accidental death	Thomas	Humphreys	
20	7	1853	Charles		Badcock	Male	8	Farmers child	Croop	Thomas	Humphreys	
23	7	1853	John		Adams	Male	0.0021	Labourers child	Fits	Wm.	Adams	Father
23	7	1853	Francis		French	Male	8	Farmers child	Croop	Thomas	Humphreys	
8	8	1853	Mary		Taylor	Female	34	Labourers wife	Dropsy	Mary	Cook	
11	8	1853	Mary		Dweedy	Female	55	Shoemakers Wife	General Decay	Thomas	Humphreys	
12	8	1853	Samuel		Quick	Male	0.02	Shopkeepers child	Overflow of the bile?	Thomas	Humphreys	
20	8	1853	Thomas		Martin	Male	87	Labourer	Accidental Death Cor. Inq.	Charles	Arthur	Coroner
24	8	1853	Elizabeth		Cox	Female	29	Farmers Wife	Natural Causes	Thomas	Humphreys	
6	9	1853	John		Brown	Male	51	Labourer	Dropsy	Thomas	Humphreys	
14	9	1853	Sarah		White	Female	74	Widow	Palsey	William	Paten	
14	9	1853	Maria		Jiffcott	Female	45	Labourers wife	Accidental Death Cor. Inq.	Charles	Arthur	Coroner
18	9	1853	Samuel		Daw	Male	43	Shoemaker	Dysentery	Charles	Kirkham	
4	10	1853	Mary	Ann	Smith	Female	21	Millers Wife	Inflamation of the lungs	James	Woodly	
8	10	1853	Stephen		Steptoe	Male	94	Gardener	Old Age	Thomas	Humphreys	
15	10	1853	John		Guest	Male		Labourers child	Convulsions Cor. Inq.	Charles	Arthur	Coroner
16	10	1853	Elizabeth		Flood	Female	7	Wheelwrights Child	Scarlet Fever	John	Wright	
17	10	1853	Emily	Jane	Hatlo?	Female	3	Farmers child	Scarlet Fever	Thomas	Humphreys	
25	10	1853	Alicia		Saltmarsh	Female		Farmers Wife	Destroyed herself by taking poison whilst temporarily insane	Charles	Arthur	Coroner
4	11	1853	Charles		Cox	Male	42	Farmer	Disease of the lungs	William	Cox	Nephew
5	11	1853	Emma	Emily?	Brumby	Female	10	Labourers child	Scarlet Fever	Thomas	Humphreys	
6	11	1853	Elizabeth		Summers	Female	3.1	Farmers Child	Scarlet Fever	James	Summers	Father
7	11	1853	Thomas	William	Brumby	Male	5	Labourers Child	Scarlet Fever	Thomas	Humphreys	
12	11	1853	James	Henry	Summers	Male	6.09	Labourers child	Scarlet Fever	Thomas	Humphreys	
14	11	1853	Charles	Henry	Brumby	Male	4	Labourers child	Scarlet Fever	Thomas	Humphreys	
15	11	1853	Rosalie		Walker	Female	29	Farmers Wife	S(?).. after Child Birth	W.	Paton?	
20	11	1853	Anne		Stebbings	Female	8	Labourers child	Scarlet Fever	Thomas	Humphreys	
27	11	1853	James		Blunt	Male	9	Labourers Child	Scarlet Fever	David	Barrett	
28	11	1853	John	Greggory	Harris	Male	60	Schoolmaster	Dropsy	William	Sterns	Nephew
7	12	1853	John	Edward	Summers	Male	5	Labourers child	Scarlet Fever	James	Summers	Father
12	12	1853	Adah?		Wright	Female	2.09	Stonemans Child	Scarlet Fever	William	Wright	Father
16	12	1853	Amelia		Adams	Female	2	Farmers child	Scarlet Fever	Richd.	Adams	Father
21	12	1853	George	Hegley	Williams	Male	5.06	Blacksmiths child	Scarlet Fever and Dysentery	Thomas	Humphreys	
23	12	1853	Harriet		Williams	Female	7	Blacksmiths child	Scarlet Fever	Thomas	Humphreys	
23	12	1853	Elizabeth		Smith	Female	5	Shopkeepers Child	Scarlet Fever	Thomas	Humphreys	
26	12	1853	Charlotte		Everette	Female	60	Widow	Low Fever	Charles	Arthur	Coroner
31	12	1853	Elizabeth		Drake	Female	75	Widow	Old age	Samuel	Day	Not mentioned

Figure 1. Registered deaths attributed to scarlet fever, measles, influenza, by month of death, Tasmania, 1840–99

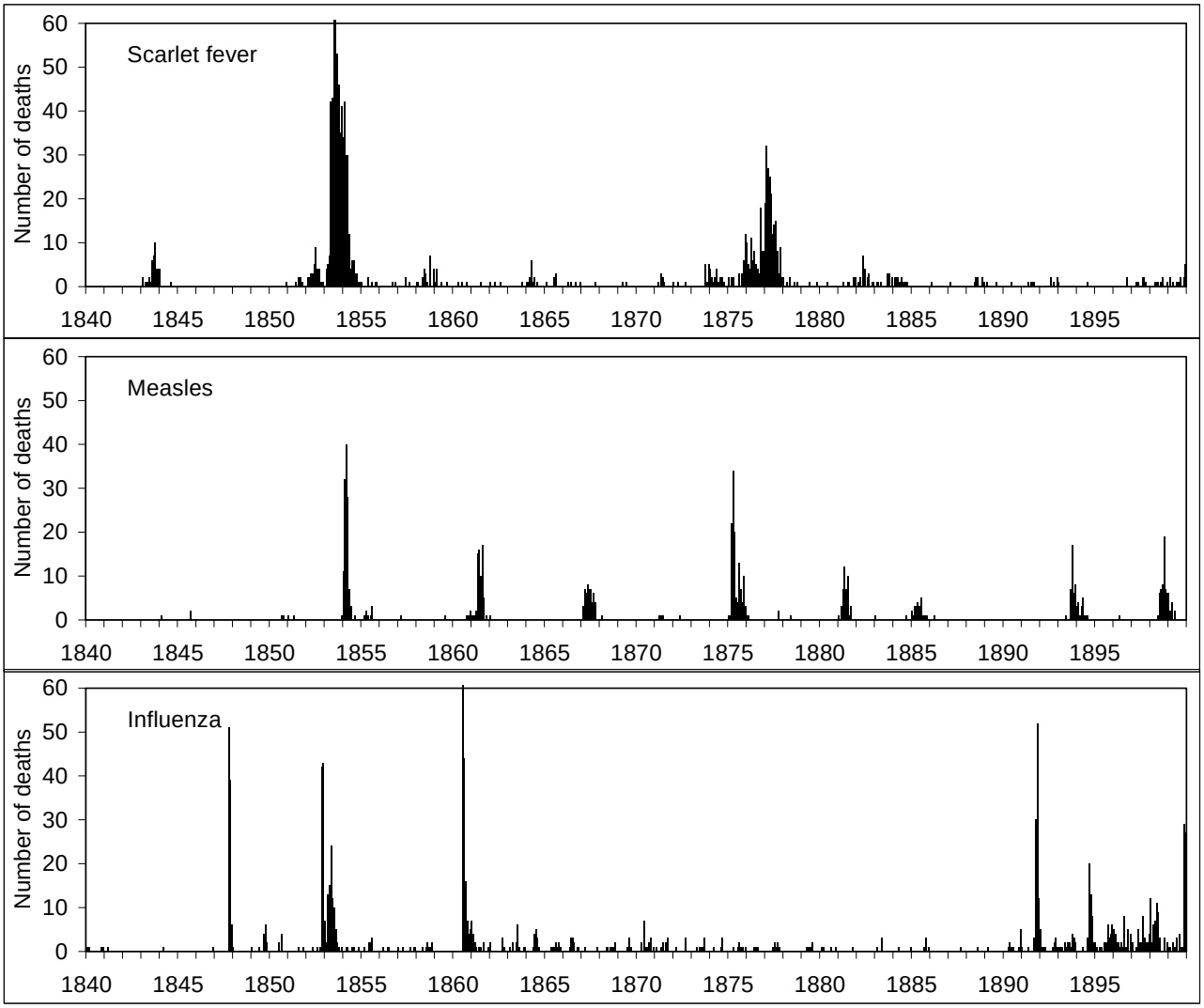

Figure 2. Registered deaths attributed to scarlet fever, measles, influenza, by month of death, Tasmania, 1852–54

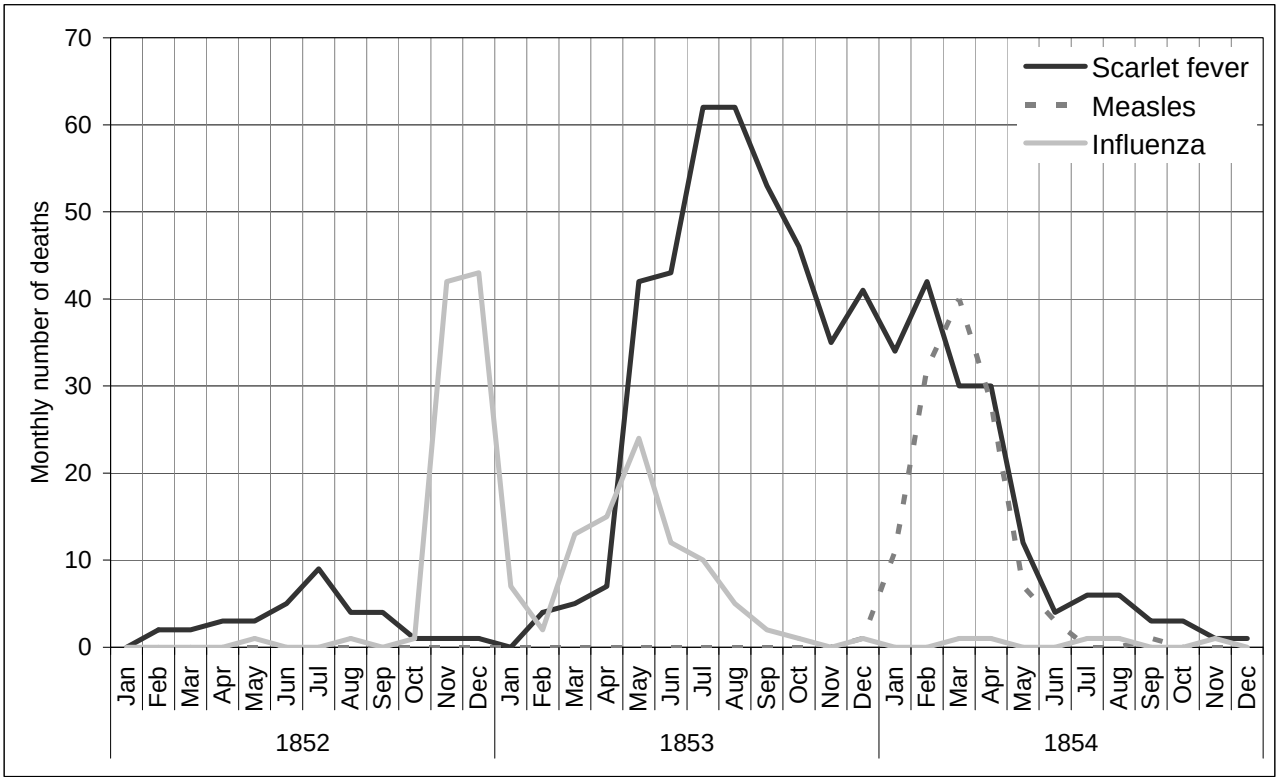

Figure 3. Registered deaths attributed to scarlet fever, measles, influenza, by age at death (%), Tasmania, 1852–54

Figure 4. Infant mortality rate by sex, Tasmania, 1845–1899

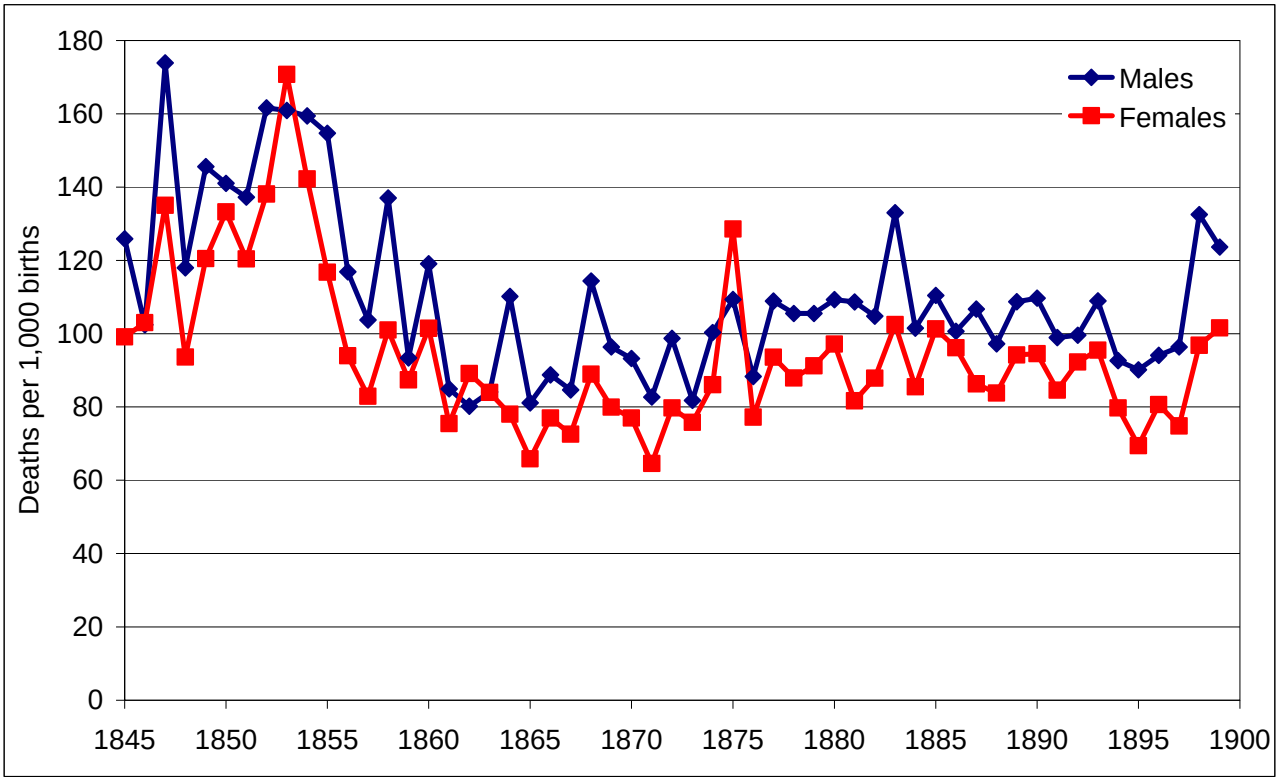

Figure 5. Death rate by sex, age 1–4 years, Tasmania, 1845–1899

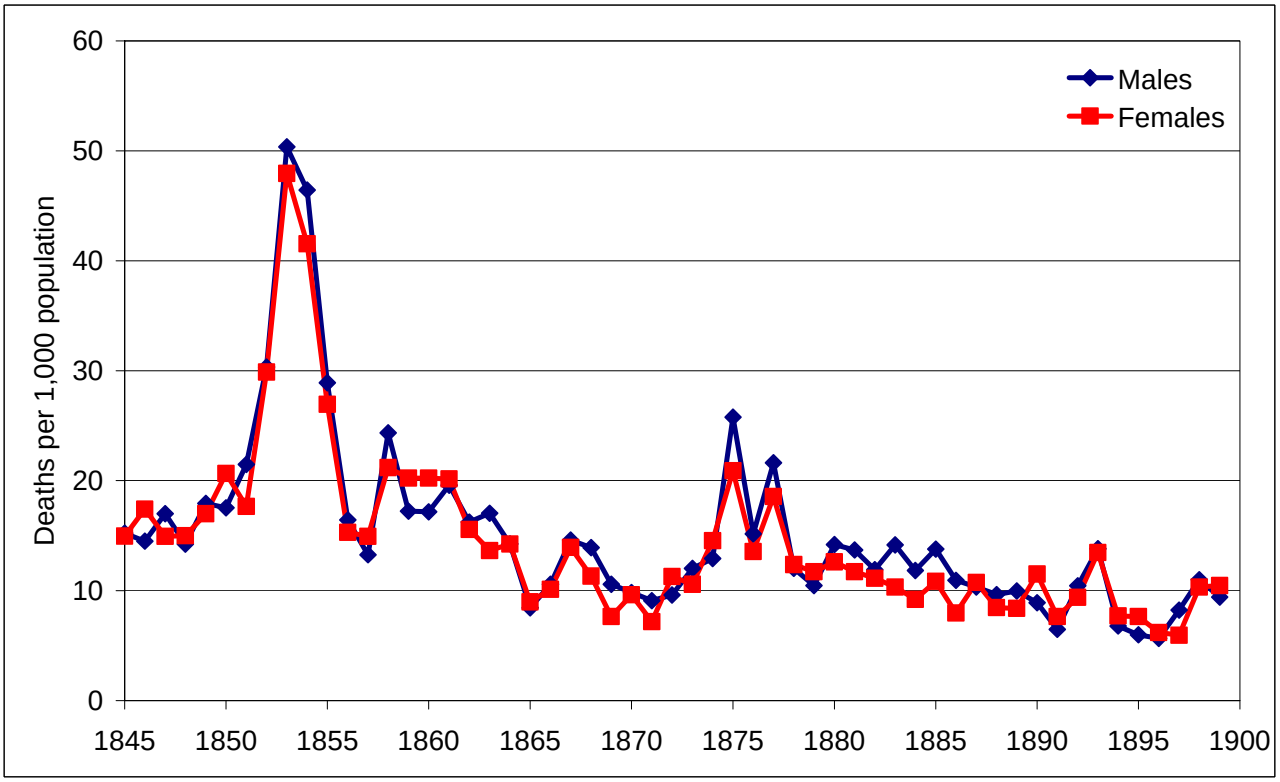

Figure 6. Death rate by sex, age 5–9 years, Tasmania, 1845–1899

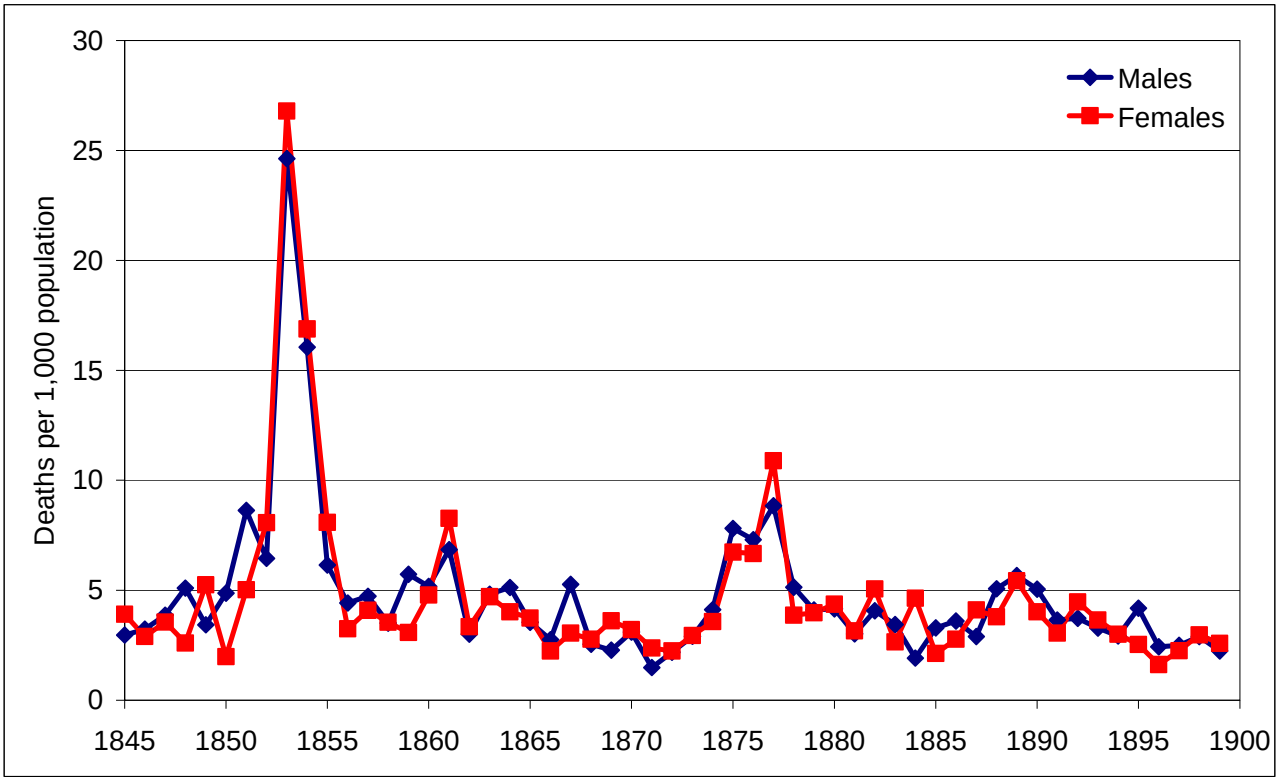

Figure 7. Death rate by sex, age 10–14 years, Tasmania, 1845–1899

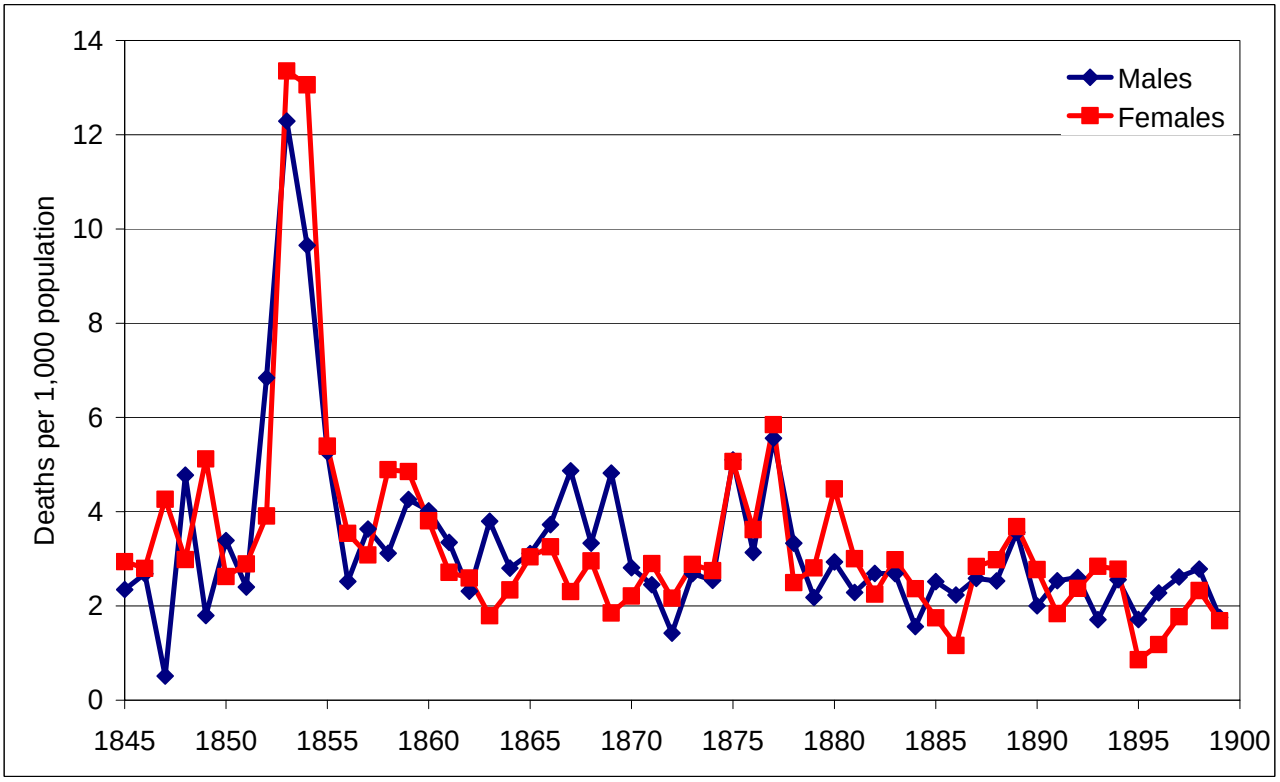

Figure 8. Death rate by sex, age 15 years and over, Tasmania, 1845–1899

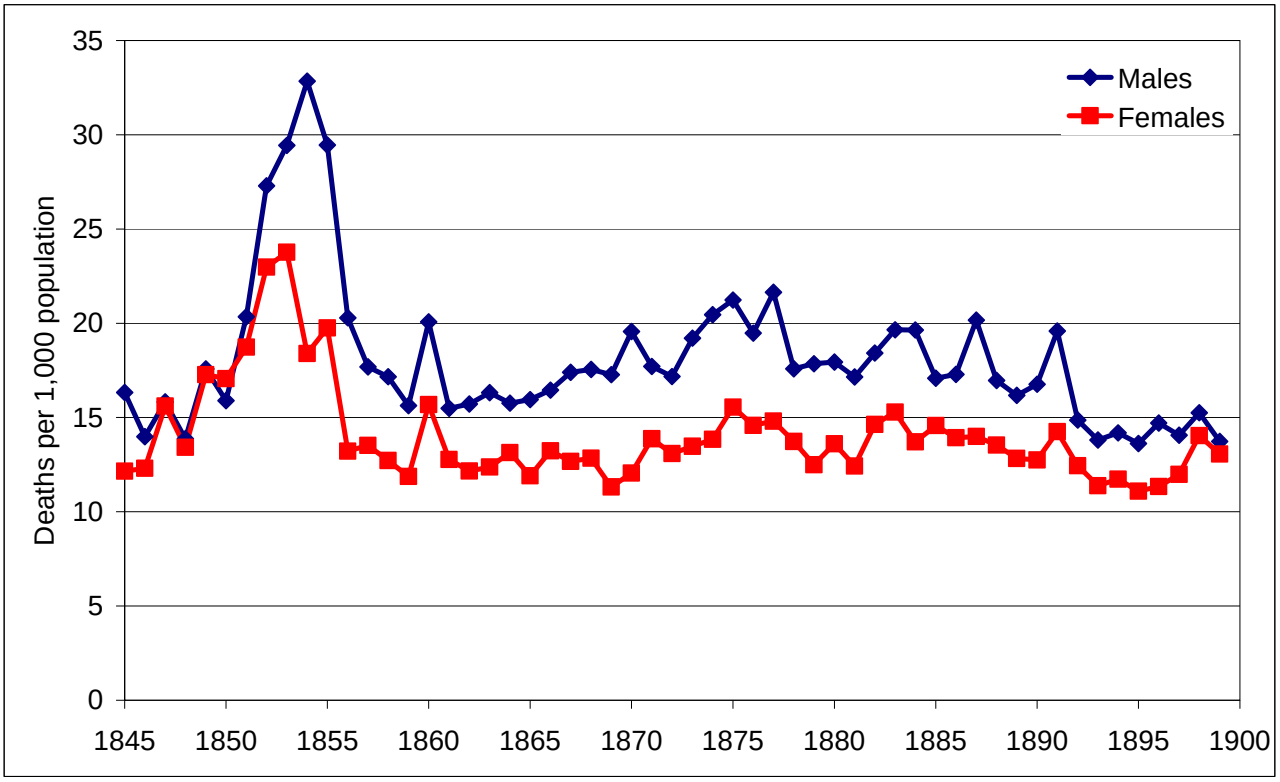

Figure 9. Family-member deaths within 6 months, by time between deaths (%), Tasmania, 1852–54

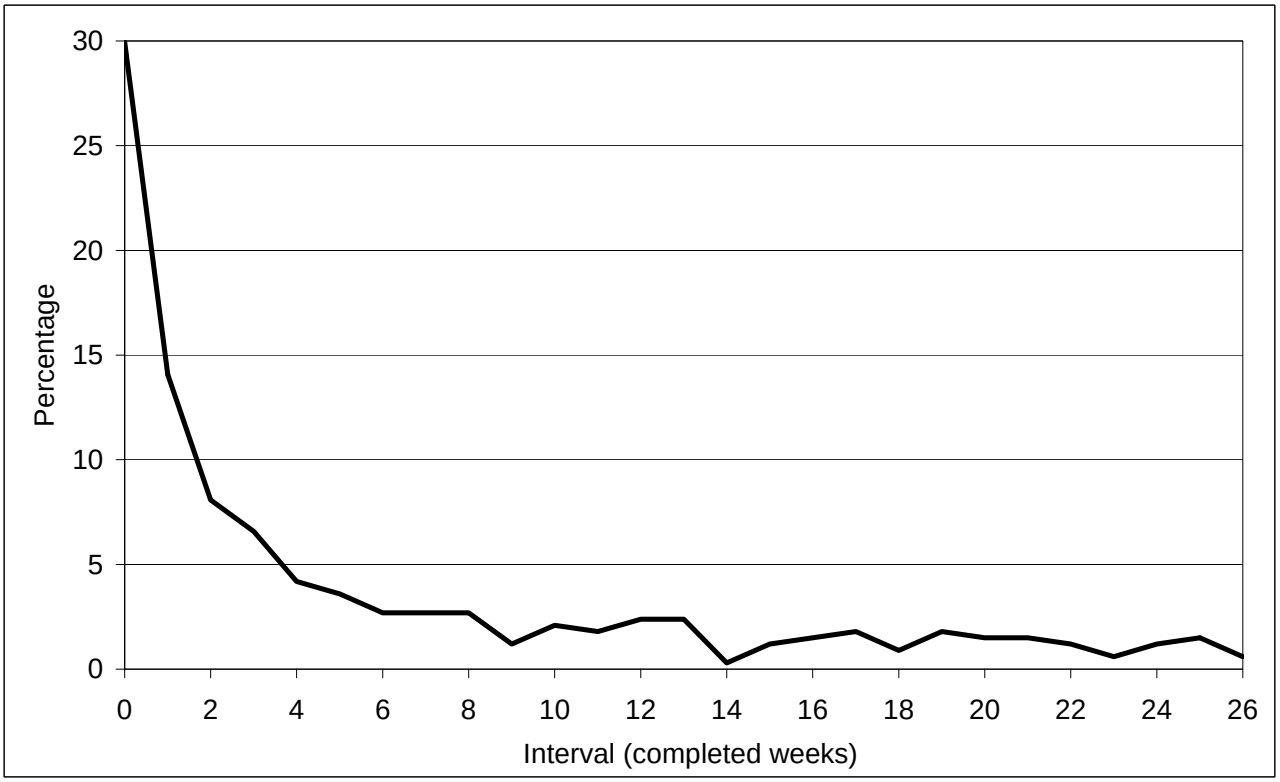

Table 2. Number of families with family-member deaths within 6 months, by relationship type, Tasmania, 1852–54 and 1855–57

	1852–54	1855–57	1852–54	1855–57
Relationship	#	#	%	%
Mother and child (childbirth)	20	11	7	15
Mother and child	35	15	12	20
Father and child	41	7	14	9
Twins soon after birth	8	11	3	15
2 siblings	129	18	45	24
3 siblings	17	4	6	5
4 siblings	6	0	2	0
5 siblings	1	0	0	0
Spouses	18	9	6	12
Parent(s) and 2+ children	13	0	5	0
Number of families	288	75	100	100
Number of deaths	627	154		
Total deaths	5,283	4,276		
2 family members	251	71	87	95
3 family members	25	4	9	5
4 family members	10	0	3	0
5 family members	2	0	1	0
Number of families	288	75	100	100