Document généré le 16 avr. 2024 21:01

Urban History Review
Revue d'histoire urbaine

URBAN HISTORY REVIEW
REVUE D'HISTOIRE URBAINE

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Volume 19, numéro 1, june 1990

Trends and Questions in New Historical Accounts of Policing

URI : https://id.erudit.org/iderudit/1017575ar
DOI : https://doi.org/10.7202/1017575ar

Aller au sommaire du numéro

Éditeur(s)

Urban History Review / Revue d'histoire urbaine

ISSN

0703-0428 (imprimé)
1918-5138 (numérique)

Découvrir la revue

Citer cet article

Barkin, R. & Gentles, I. (1990). Death In Victorian Toronto, 1850-1899. *Urban History Review / Revue d'histoire urbaine*, *19*(1), 14–29. https://doi.org/10.7202/1017575ar

Résumé de l'article

L'examen des 24 124 décès consignés dans les registres des cimetières Potter's Field et Necropolis de 1850 à 1899 montre que le taux de mortalité n'était pas moins élevé à Toronto que dans les autres villes du XIX^{e} siècle. La moyenne d'âge au décès augmente graduellement durant ces 55 années, mais on constate que plus de 40 % des décédés sont des enfants de moins d'un an. Parallèlement à la tuberculose, principale cause de mortalité chez les adultes, la typhoïde, causée par la mauvaise qualité de l'eau potable, fait des ravages importants.

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Death In Victorian Toronto, 1850-1899

Risa Barkin and Ian Gentles

Abstract

A study of the 24,124 deaths recorded in the burial registers of the Potter's Field Cemetery and the Necropolis from 1850 to 1899, indicates that Toronto, like other nineteenth-century cities, experienced very high mortality. The average age at death rose gradually over the fifty-year period, but infants under the age of one year constituted over 40 percent of all burials. Tuberculosis was the leading cause of death among adults, while poor water produced substantial mortality from typhoid.

Résumé

L'examen des 24 124 décès consignés dans les registres des cimetières Potter's Field et Necropolis de 1850 à 1899 montre que le taux de mortalité n'était pas moins élevé à Toronto que dans les autres villes due XIX siècle. La moyenne d'âge au décès augmente graduellement durant ces 55 années, mais on constate que plus de 40% des décédés sont des enfants de moins d'un an. Parallèlement à la tuberculose, principale cause de mortalité chez les adultes, la typhoïde, causée par la mauvaise qualité de l'eau potable, fait des ravages importants.

The study of historical demography in Canada has been hampered by the relative lateness of the establishment of an efficient national system of civil registration. In addition, there are in English Canada no systematic parish records upon which the historian can draw for demographic research.[1] Despite these handicaps, a major contribution in the field has been made by Robert Bourbeau and Jacques Legare in their pioneering study of Canadian mortality between 1831 and 1932.[2] However, as they point out, before 1931 the censuses provide us with only the number of deaths for the years preceding their publication; in other words all we have at the national level from the census of 1852 until that of 1921 is a snapshot of mortality once every ten years. Furthermore, the figures are not reliable, since they are based on human memory, and very likely underestimate the mortality of those who died alone.[3]

Another problem bedeviling the history of Canadian demography is the high rate of in-and-out migration in comparison with much more stable countries like Britain and France. Most demographic techniques assume either that the population under study is closed or that migration into or out of the population is negligible. For Canada this is manifestly untrue. During most of the 19th century there was substantial immigration from England, Scotland, Ireland and the United States. Nevertheless, it is generally agreed that the latter part of the century witnessed a net loss of population owing to migration to the U S. The deficit was more than made up by the great waves of European immigration that took place in the first two decades of this century.

Based on the available information about crude death rates and the percentage of the population aged 65 years and over, which is available for the whole country decennially from 1851 and for Quebec from 1831, Bourbeau and Legare have produced the following table for life expectancy at birth (e_0) of men and women. This is compared with the figures derived from the Ledermann standard life table.[4]

Both tables show a significant rise in life expectancy over this half century, due in the main, apparently, to improved public health.[5] It is widely recognized that mortality was much higher in 19th century cities than it was in the countryside.[6] With reference to England and Wales, Wrigley and Schofield have concluded that "the rapid rise in the proportion of the population living in cities had much to do with the absence of any significant improvement in expectation of life between 1820 and 1870."[7]

Another salient feature of later 19th century demography in Europe and North America is the higher life expectancy of women over men. It is now recognized that maternal mortality in childbirth prior to the 20th century was not as high as some have thought,[8] and in the latter part of the 19th century, women appear to have widened the gap even further. In England at least the drop in female mortality does not appear to have been brought about by any improvement in the safety of childbirth. Rather it is attributable to a disproportionately rapid fall in female deaths from the greatest killer of the 19th century: tuberculosis. In mid-Victorian England about half the women who died between the ages of 15 and 35 were killed by some form of consumption. In contrast, no more than one per cent of these women died from pregnancy or childbirth-related difficulties. In the 1840s and 1850s about eight per cent more women than men died from tuberculosis. After the 1880s however, it had become a disease that regularly struck more males than females.[9] It remains to be seen whether the Canadian experience of male/female mortality was similar in the Victorian age.

Given the unsatisfactory nature of national census records, the best hope of obtaining a more accurate picture of Canada's

Table 1
Canadian Life Expectancy in the Second Half of the Nineteenth Century

	e_0 (Bourbeau & Legare) m & f	e_0 (Lederman) m	f
1851	29.98	40.03	42.14
1861	34.40	40.58	42.66
1871	37.50	41.41	43.76
1881	41.60	43.50	46.02
1891	44.45	43.92	46.49
1901	47.70	47.19	50.15

Table 2
Deaths by suicide and drowning in late 19th-century Toronto

	1850-67	1868-85	1886-99	totals
suicide: M	4	18	10	32
F	2	5	4	11
drowning: M	56	102	39	197
F	14	15	5	34

demographic history lies in local studies. Cemetery records have remained a largely untapped source until very recently. The city of Toronto, for example, boasts four sets of well-kept cemetery registers dating from the second half of the 19th century and before. Those belonging to the Toronto Necropolis, St James' Cemetery and the Potter's Field Cemeteries are preserved. The register of the Catholic Cemetery of St Michael are kept by the Catholic Archdiocese of Toronto.

This article is based on a tabulation of 24,124 deaths recorded in the Necropolis and Potter's Field registers from 1850 to 1899. The records of the St Paul's and St Michael's cemeteries remain to be examined. The Potter's Field Cemetery was created for poor people, and was closed in 1855. Its records yield a total of 1,817 deaths for the six years 1850-55. This number is too small to yield any meaningful insights into the contrast between mortality among the poor and the better off. What makes the Necropolis register a gratifyingly rich source, apart from the very large number of entries, is the range of information it provides. Each entry contains five pieces of data for the deceased person: name, sex, cause of death, age at death, and place or country of birth. The information is not without its difficulties. The causes of death, for example, frequently diverge from modern medical categories. They sometimes turn out to be more a description of symptoms than an accurate etiology of the disease that brought about the death. Even though most entries appear to have been based on a doctor's report rather than the impression of the scribe (as in earlier centuries), the descriptions include some relatively unhelpful terms such as ague, bleeding, bowel complaint, cholic, convulsions, croup, dropsy, fever, natural decay, old age, palsy, sudden death, water on the brain, and vomiting. Other entries inadvertently provoke a smile: kicked by horse, hit by shovel, and visitation of God. Nevertheless, the number of these obscure entries is quite low. Apart from convulsions, inflammation, and debility, the most common causes of death fall into categories familiar to modern medicine: consumption, stillbirth, bronchitis, cholera, scarlet fever, lung disease, whooping cough, typhoid, dysentery and diarrhoea.

Suicide was rare in the first third of the period (1850-67: four males and two females), but became much more common in the middle third (1868-85: eighteen males and five females), while declining slightly towards the end of the century (1886-99: ten males and four females). While there were great fluctuations in the suicide rate, the relationship between the male and female rates remained fairly stable: women were only about a third as likely as men to take their own lives. How many suicides were concealed in other categories can never be known. One wonders, for example, how many of the frequent drownings were suicides.

Another problem raised by the sources is the category of unknown. A small proportion of deaths list sex as unknown. The great bulk of these, however, were stillbirths, and it seems probable that most of the rest — who died mainly of convulsions, respiratory or gastric complaints — were newborn babies. One must also be cautious about the accuracy of estimates of age in an era before most people possessed birth certificates, and when there is no way of checking the age stated by their closest relative or caregiver against an objective source like a parish register. It remains to be seen whether the tendency for the numbers in the first half of each decade of life to be overstated, as was discovered in England, will be found for this cohort.[10] Fortunately, the proportion of entries for which the place of birth and the cause of death are unknown, is quite low, which increases the value of this source for the study of migration and disease respectively.

A final problem connected with the records of the Necropolis and Potter's Field cemeteries is that they exclude most of the Catholic population who were buried in St Michael's cemetery. Thus, the Irish population, most of whom were Catholic, are underrepresented. It has been observed that the Irish Catholic population in American cities experienced the highest mortality of any ethnic group.[11] The records of the Necropolis indicate that there was also a substantial population of Irish protestants dwelling in Victorian Toronto. Their pattern of mortality was probably closer to that of the Scots and English than it was to their Catholic compatriots.

The cemetery records are invaluable in providing a pre-census glimpse of the ethnic origins of Toronto's population. While the population of Canada as a whole declined slightly toward the end of the 19th century, Toronto grew by leaps and bounds (Table three).[12]

The place of origin of those who died in the second half of the nineteenth century is shown in Table Four.

Table 3
Toronto's Population Growth, 1850-1890

1851	30,775
1861	44,821
1871	56,000
1875	68,678
1881	96,196
1890	181,220

Table 4
Place of Origin of People Buried in the Potter's Field and Necropolis Cemeteries, 1850-99

	1850-54	1855-9	1860-4	1865-9	1870-4
Toronto	169	996	1,413	1,598	2,137
Rest of Ontario	5	7			
Rest of Canada and Newfoundland	8	81	74	135	285
U.S.A.	5	138	130	115	110
England	47	235	245	307	562
Ireland	50	218	241	250	370
Scotland	126	261	241	182	228
Continental Europe	1	14	16	10	26
West Indies	1	2	3	1	4
Other	1	5	1	1	5
Unknown	80	30	11	42	13
Totals	**493**	**1,987**	**2,375**	**2,641**	**3,740**

	1875-9	1880-4	1885-9	1890-4	1895-9	Total
Toronto	2,291	1,698	1,305	1,136	1,136	13,879
Rest of Ontario	—	—	—	—	—	12
Rest of Canada & Newfoundland	242	159	158	355	322	1,819
U.S.A.	100	65	47	63	56	829
England	396	274	255	284	339	2,944
Ireland	291	222	181	216	199	2,238
Scotland	254	204	186	190	152	2,024
Continental Europe	12	9	4	12	15	119
West Indies	2		—	—	3	17
Other	4	2	—	2	2	23
Unknown	2	1	8	4	29	220
Totals	**3,594**	**2,635**	**2,144**	**2,262**	**2,253**	**24,124**

Table 5
Ethnic Origin of Toronto Residents in the mid-nineteenth century

Place of Origin	1850	1861
England and Wales	4,958	7,112
Scotland	2,169	2,961
Ireland	11,305	12,441
Canadian (non-French)	9,856	18,767
Canadian (French)	467	435
U.S.	1,405	2,031
Other	515	510

Table 6
Mean Age of Adults Buried in the Necropolis, 1850-99

	1850-54		1855-9		1860-4		1865-9		1870-4	
	M	F	M	F	M	F	M	F	M	F
no.	109	113	481	376	488	453	522	469	791	672
mean age	45.4	42.4	43.6	41.0	48.1	45.9	48.5	47.9	46.2	44.9
	1875-9		1880-4		1885-9		1890-4		1895-9	
	M	F	M	F	M	F	M	F	M	F
no.	659	587	538	506	492	459	593	538	586	589
mean age	49.0	48.4	50.9	52.8	53.1	55.9	55.0	53.7	56.2	55.9

Bearing in mind that the bulk of the Irish population would have been buried in the Catholic cemetery, and therefore do not show up in these figures, the pattern of ethnic origin is similar to that discovered by Masters for the mid-century.[13]

At first glance what is striking about the cemetery records is the high number of people born in Toronto. However, the bulk of the Toronto-born were children. If those below the age of 16 were subtracted, the proportion of the *adult* population born in Toronto would be seen to be much smaller. The average age of the adults (aged sixteen and over) who were buried in the necropolis rose from 43.9 to 56 between and middle and the end of the century. (Table Six).

The mention of those who died under the age of 16 brings us to the question of infant and child mortality. The data reveal that between thirty and forty-six of those whose deaths were recorded in the two cemeteries were under one year old. (Table Seven). Given the high rate of Catholic Irish mortality in other North American cities during this era, it is unlikely that the population buried in St Michael's would have experienced a lower infant mortality.[14]

Toronto's infant mortality in the later nineteenth century was therefore shockingly high. Indeed, the rate may have exceeded that which prevailed in England and Wales between the sixteenth and eighteenth centuries, and may even have exceeded the infant mortality of the great British industrial cities in the nineteenth.[15] Further research will be needed to determine precisely the reasons for Toronto's very high infant and child mortality in the nineteenth century. There can be little doubt, however, that the underlying causes of infant mortality were poor nutrition, poor sanitation and the absence of immunization from those manifold childhood diseases whose existence is only a dim memory today — diptheria, whooping cough, polio, scarlet fever — as well as the great nineteenth century killers — TB, cholera, typhoid and typhus. Another cause of infant death must have been the ingestion of contaminated cow's milk, leading to bovine tuberculosis.[16] Not until 1918 did Toronto pass the first ordinance requiring the pasteurization of milk.[17]

What were the principal causes of death in Victorian Toronto, as revealed by the records of the two cemeteries? In almost every year the single leading cause was consumption or tuberculosis.

In the third quarter of the century tuberculosis deaths approximately kept pace with the rise in population. In the last quarter of the century, however, mortality from this disease declined absolutely; as a proportion of the population it shrank even faster. Public health measures were beginning slowly to have their effect.[18]

Tuberculosis may have been the most lethal, but the horror disease of the 19th century was cholera. Originating in India it first reached Canada in 1831, coincidentally with a surge of Irish immigration. There were then repeated epidemics every few years in Canada between 1832 and 1871. Cholera is caused by a bacillus that can live independently in water for lengthy periods. Once swallowed, if it survives within the stomach, it is capable of multiplying rapidly.[19] Its effect is to make the walls of the intestine more permeable to water. The consequence is vomiting, dehydration, spasms, cramps, a sunken face, blue skin colour and eventually kidney failure. This process can take place within a matter of hours or days, and carries off at least half its victims. Today the disease is curable with antibiotics and intravenous transfusions. In the 19th century, however, there was no known cure. It was commonly believed that the disease was connected with filthy living conditions, since it was mainly the poor who were afflicted. In England in 1848 Dr John Snow had established the correlation between the incidence of cholera and a contaminated water supply, but his findings were not widely accepted by the medical profession until the 1880s. The last serious epidemic in Toronto occurred in 1854, though there was a steady mortality from the disease right until the end of the century. In 1854 there were 183 burials due to the disease in the two cemeteries, the overwhelming majority occurring in Potter's Field at Yonge and Bloor streets.[20] High though it was, the mortality rate in 1854 was significantly lower than it had been in 1834. "Butcher suppliers were cleaner, and water had been drained from stagnant cellars. The clothing and bedding of the dead were destroyed by fire, or baked at a high temperature, and then thoroughly washed in chloride of lime. The infected corpses were encased in coffins as soon as possible after death and covered with 25 pounds of lime."[21]

Typhoid is another water-borne disease which became a serious threat until the city took effective measures to protect its drinking water. In 1845 Toronto had built its main east-west sewer, placing the outlet at the foot of Peter Street, adjacent to the waterworks intake. The quality of water was in consequence extremely variable. Witnesses at a major downtown fire in 1866 saw a fire engine spurt forth mud and catfish that it had drawn from the hydrant at the corner of King and Yonge Streets. The absence of any water filtration, combined with "the system obstinately persisted in, of emptying into the bay all the filth of the city, public and private . . ." constituted a serious health hazard. The hazard was compounded by the fact that thousands of animals were slaughtered annually in the city, and the offal discharged into the sewers, further contaminating the water supply. If that were not bad enough, numerous cattle were fed on the slop from the Gooderham and Worts distillery, and the manure that was emptied into Toronto Bay in the spring from this source "could be measured by the furlong." In the 1860s Toronto was thought by many to be one of the dirtiest and unhealthiest cities on the continent.[22] The result of the city's carelessness about its water supply was a

Table 7
Infant and Child Mortality in Toronto, 1850-99

A. MALES	1850-54 no.(%)	1855-9 no.(%)	1860-4 no.(%)	1865-9 no.(%)	1870-4 no.(%)
Total Deaths	242	1,027	1,142	1,272	1,870
Deaths under 1 yr.	89(37)	402(39)	445(39)	539(42)	820(44)
Deaths 1-5 yrs.	30(12)	86(8)	117(10)	106(8)	156(8)
Deaths 6-15 yrs.	14(6)	58(6)	92(8)	75(6)	103(6)
Total infant & child deaths	133(55)	546(53)	654(57)	720(57)	1,079(58)

	1875-9 no.(%)	1880-4 no.(%)	1885-9 no.(%)	1890-4 no.(%)	1895-9 no.(%)
Total Deaths	1,673	1,211	1,009	1,101	1,045
Deaths under 1 yr.	768(46)	521(43)	390(39)	347(32)	348(33)
Deaths 1-5 yrs.	159(10)	95(8)	67(7)	84(8)	64(6)
Deaths 6-15 yrs.	87(5)	57(5)	60(6)	77(7)	47(4)
Total infant & child deaths	1,014(61)	673(56)	517(51)	508(46)	459(44)

Table 7 (cont'd)

B. FEMALES	1850-4 no.(%)	1855-9 no.(%)	1860-4 no.(%)	1865-9 no.(%)	1870-4 no.(%)
Total deaths	204	776	983	1,058	1,505
Deaths under 1 yr.	62(30)	231(30)	334(34)	404(38)	617(41)
Deaths 1-5 yrs.	23(11)	98(13)	124(13)	105(10)	130(2)
Deaths 6-15 yrs.	6(3)	71(9)	72(7)	80(8)	86(6)
Total infant & child deaths	91(45)	400(52)	530(54)	589(56)	833(55)
	1875-9	**1880-4**	**1885-9**	**1890-4**	**1895-9**
Total deaths	1,488	1,082	894	973	975
Deaths under 1 yr.	672(45)	444(41)	319(36)	302(31)	293(30)
Deaths 1-5 yrs.	145(10)	82(8)	63(7)	67(7)	53(5)
Deaths 6-15 yrs.	84(6)	50(5)	53(6)	66(7)	40(4)
Total infant & child deaths	901(61)	576(53)	435(49)	435(45)	386(40)

Table 8
Deaths from Tuberculosis recorded in the Necropolis and Potter's Field Cemeteries, 1850-1899

A. MALES	1850-4	1855-9	1860-4	1865-9	1870-4	1875-9
no.	15	149	140	157	176	158
%	6	15	12	12	9	9
(total deaths)	242	1,027	1,142	1,272	1,870	1,673
		1880-4	1885-9	1890-4	1895-9	1850-99
no.		94	57	31	59	1,036
%		8	6	3	6	9
(total deaths)		1,211	1,009	1,101	1,045	11,592
B. FEMALES	1850-4	1855-9	1860-4	1865-9	1870-4	1875-9
no.	5	123	128	144	160	149
%	2	16	13	14	11	10
(total deaths)	204	776	983	1,058	1,505	1,488
		1880-4	1885-9	1890-4	1895-9	1850-99
no.		96	47	38	58	948
%		9	5	4	6	10
(total deaths)		1,082	894	973	975	9,938

steadily increasing mortality from typhoid and other diseases.

Typhoid deaths peaked in the 1870s. Until that decade the supply of drinking water had been in the hands of private companies. After a twenty-year campaign that had got underway in the 1850s a public waterworks was finally established. Typhoid deaths then dropped at the same time that Toronto's population surged upward. The wooden conduit was replaced with steel in the late 1870s,[23] but this was not the end of the city's tribulation over its water supply. In addition to the sewage that was piped into the Bay the contents of many domestic privies continued to be dumped there. In August 1890 a pile was inadvertently driven through the under water conduit pipe, causing it to take in a large quantity of contaminated water. In February 1893 the conduit pipe was again broken; it rose to the surface and sucked in a lot of the human waste that had been deposited on the ice during the winter.[24] The melancholy result of these accidents was that the reported cases of typhoid shot up in the fall of 1890 and 1891, and the late winter of 1893.

In the absence of systematic birth and death records we cannot arrive at precise figures for life expectancy in English Canada. However, the age-at-death figures from the cemetery records offer the next best thing. They show that for Toronto from the 1850s to the 1890s, deaths in the first year of life constituted over 40 per cent of all deaths recorded. Infant mortality improved very little in the late 19th century. If a child reached the age of five he had a fighting chance of surviving to middle age or beyond. The mean age at death of those over five years old rose from 40.3 in 1868 to 52.1 in 1898.

According to these figures the mean age at death in Toronto in the late 19th century was dramatically lower than the life expectancy discovered by Bourbeau and Legare for Quebec. Exact comparisons cannot be made between figures for life expectancy(e_o) and figures for age at death, but even a rough comparison is illuminating. An approximate comparison is obtained if we add the life expectancy to the year in which it was measured, and compare the age at death in Toronto. (See Table Eleven) The low age at death in Toronto is doubtless the product of two factors: the high proportion of immigrants in the population, and the debilitating effects of the urban environment. Yet we know that before the end of the century, if not earlier, Toronto had a lower death rate than most other large cities in North America and Europe. In 1866 the Medical Health Officer reported that Toronto's death rate was 26.2 per thousand.[25] By 1897 that rate had shrunk to 15.1 per thousand, and the Medical Health Officer was trumpeting the fact that among 34 European and North American cities, Toronto had the fifth lowest death rate. Montreal, by contrast, with 24.8 deaths per thousand population, had the second highest rate. As Terry Copp has noted, Montreal was one of the unhealthiest cities in the western world in this period.[26] Toronto's mortality was also significantly lower than Boston and New York. The only major U.S. cities that were healthier to live in than Toronto were apparently Chicago, Cleveland and Milwaukee. It may be significant that the Board of Health chose to do these comparative studies, in the late 1890s when diptheria, typhoid and scarlet fever had subsided, rather than in the early years of the decade, when all three infectious diseases had raged out of control.

Table 9
Typhoid Mortality, 1850-99

	1850-4	1855-9	1860-4	1865-0	1870-4	1875-9
Male	0	2	6	13	59	29
Female	0	5	5	8	35	29
Total	**0**	**7**	**11**	**11**	**94**	**58**
		1880-4	**1885-0**	**1890-4**	**1895-9**	**Total**
Male		24	14	32	15	194
Female		24	14	29	11	160
Total		**48**	**28**	**61**	**26**	**354**

Table 10
Reported Cases of Typhoid, 1889-1893

	Cases	Deaths
1889	273	—
1890	907	—
1891	855	—
1892	426	111
1893	476	80
1894	249	34

Sources: *Annual Report of the Local Board of Health for the Year 1894* (Toronto: J.Y. Reid, 1895), p. 8; *Annual Report . . . for . . . 1899*, p. 24.

A propagandistic intent behind the studies purporting to show Toronto's relative healthfulness is also hinted at in the suggestion that the improved mortality was owing to the establishment of the isolation hospital on Broadview Avenue in 1891. In an era where calomel (mercurious chloride) was still being used to treat diptheria, this is a dubious proposition.

The steady rise in the age-at-death from the middle to the end of the 19th century was more likely the result of improvements in preventive public health measures, and perhaps also in nutrition. There are virtually no developments in 19th-century medicine that had a statistically measurable impact on mortality.[27] Not until the use of sulphanimides and antibiotics became widespread after the second world war was medical treatment a significant factor in reducing mortality from infectious diseases.

How many of the deaths recorded in the late 19th century could have been prevented by superior public health conditions, by antibiotics, or by other forms of medical intervention? Accurate answers to these questions are rendered impossible by the problems of nomenclature found in the records. A variety of different terms are used for the same class of conditions. Furthermore, there is a general lack of a standardized nomenclature in the 19th century.

Thus, the records show many deaths listed as paralysis, paralytic stroke or hemiplegia. Apoplexy is also given as a cause of death. In 1853 it was defined as "a malady, sudden in its attack, which arrests the powers of sense and motion; usually caused by an effusion of blood or serum in the brain, and preceded by giddiness, partial loss of muscular power, etc. Occasionally applied to the effusion of blood in other organs."[28] Paralysis is a frequent result of this kind of attack. Sometimes one whole side of the body is affected (hemiplegia), while in other instances only the face, arm or leg on one side is affected. Clearly, all these causes of death would now be classified as paralytic stroke.

More difficult is the problem posed by the use of one term to identify what are now recognized as a variety of diseases. Many adults are described as dying from water in the head or water on the brain. The disease in question could be anything from meningitis to brain tumour, or even brain hemhorrage. Or, again, the term dropsy is sometimes used. Stedmen's *Medical Dictionary* defines it as "a morbid accumulation of watery fluid in the serous cavities and within the connective tissue of the body." Today medical practitioners recognize that it could represent kidney failure, heart failure or lung failure.

The obstacles posed by the differences in modern and 19th century nomenclature, as well as the occasional vagueness of the records, were not insuperable however. With the invaluable assistance of Dr Martin Barkin, former President of the Sunnybrook Medical Centre in Toronto, we have divided the causes of death into four categories:

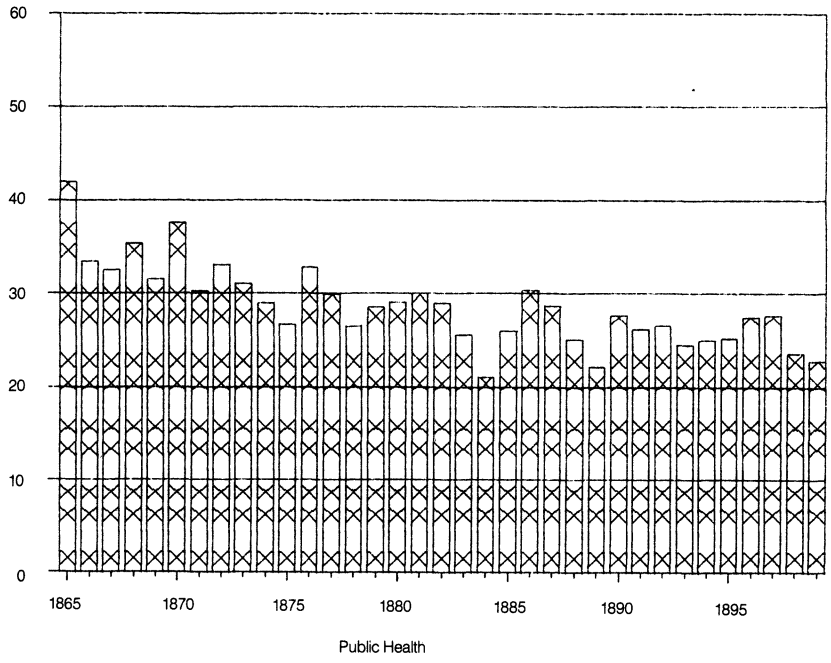
A. Conditions which today are prevented through sanitation (sewers and water purification) or other public health measures (e.g. immunization);
B. Infectious diseases which could be cured by modern antibiotics and/or surgical treatment with a high probability of success (excluding those which would have already been prevented by public health measures);
C. Other conditions now treatable and curable with a high probability of success;
D. Conditions which, even it treatable by other methods today, still do not have an assured high probability of success.

It is startling to realize that the great majority of death-dealing illnesses suffered by our ancestors are now preventable or treatable. Moreover, public health measures — the building of drains and sewers, the piping of pure water to every household, and the institution of large-scale immunization programmes, have done more than all the measures of active medical intervention put together to save human lives. If we also bear in mind the unquantifiable effects of improved nutrition, it is abundantly evident that, despite current concerns about the pollution of water and air, the modern city is a far healthier place to live than its Victorian predecessor.

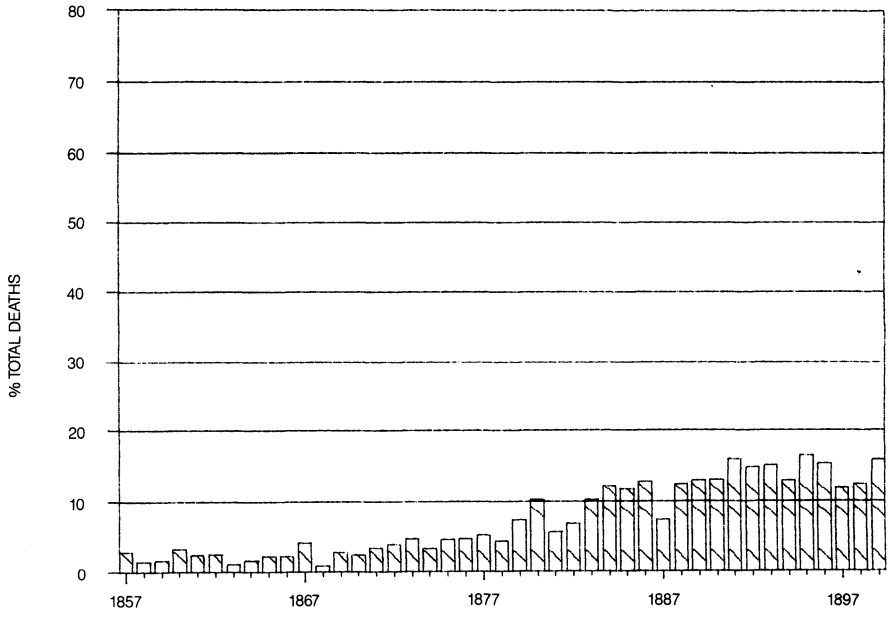
Table 11
Mean Death at Age, 1850-99

A. MALES	1850-4	1855-9	1860-4	1865-9	1870-4
from age 0	27.5	23.2	23.2	24.4	22.7
from age 6	39.6	40.3	42.3	44.1	42.2
from age 16	44.3	43.6	48.1	48.5	46.2
	1875-9	**1880-4**	**1885-9**	**1890-4**	**1895-9**
from age 0	22.8	26.9	30.2	34.1	35.3
from age 6	44.7	47.2	48.5	50.2	53.0
from age 16	49.0	50.9	53.1	55.0	56.2
B. FEMALES	**1850-4**	**1855-9**	**1860-4**	**1865-9**	**1870-4**
from age 0	28.1	22.3	23.9	24.0	22.8
from age 6	40.9	36.4	41.3	42.5	41.2
from age 16	42.4	41.0	45.9	47.9	44.9
	1875-9	1880-4	1885-9	1890-4	1895-9
from age 0	23.3	28.2	33.3	33.4	37.5
from age 6	43.9	49.1	51.4	48.9	53.1
from age 16	48.4	52.8	55.9	53.7	55.9

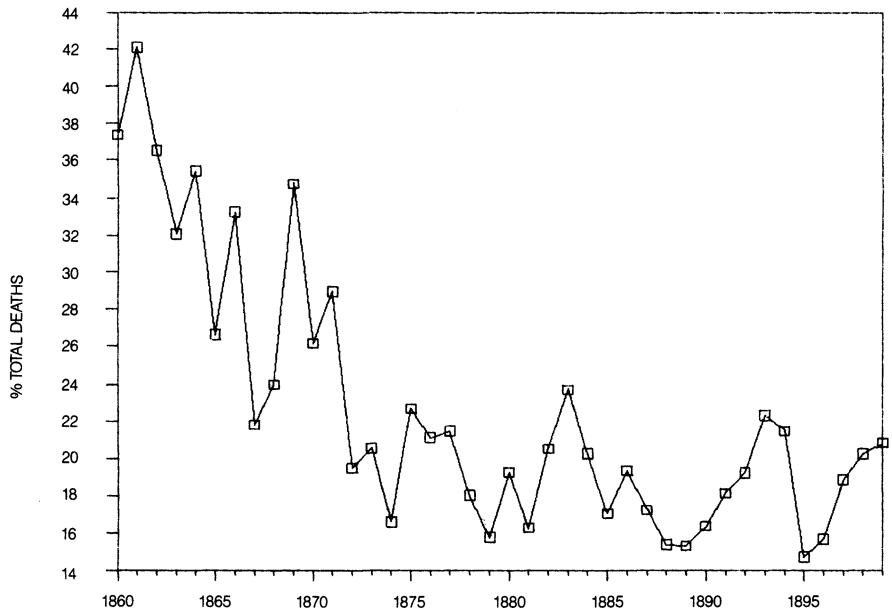
A: PREVENTABLE BY PUBLIC HEALTH MEASURES



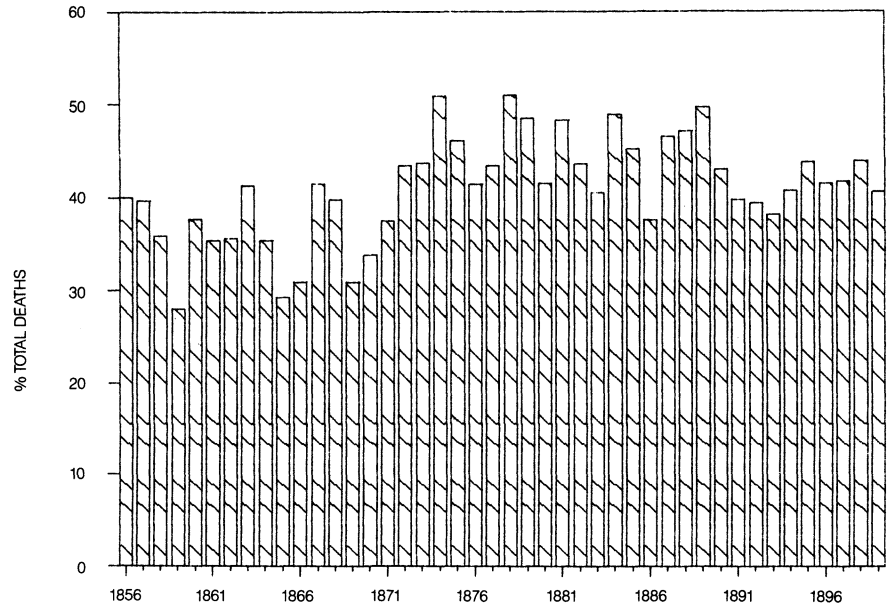
B: CURRENTLY TREATABLE BY ANTIBIOTICS



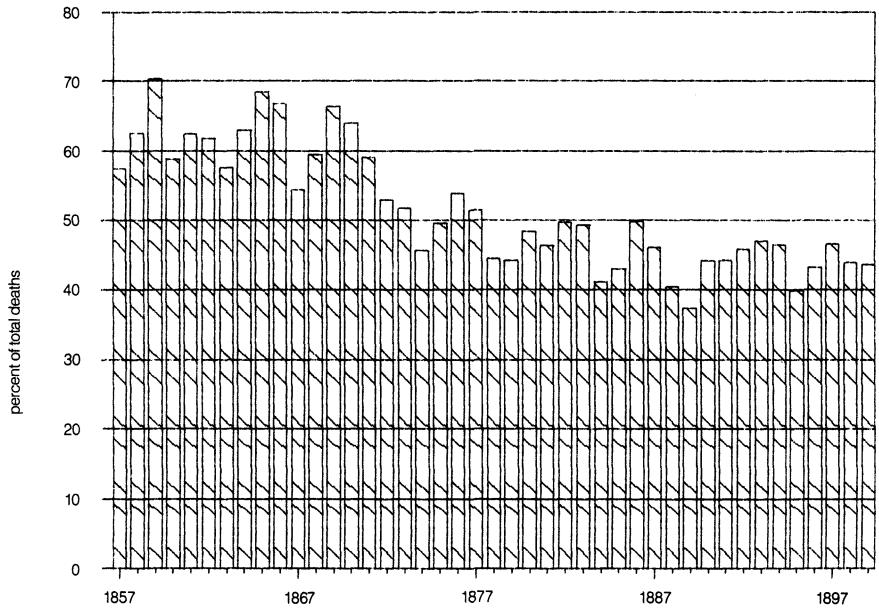
C: PREVENTABLE OR TREATABLE BY MODERN MEDICINE (excluding antibiotics)



D: UNPREVENTABLE AND UNTREATABLE



A,B,C: EFFECTS OF PUBLIC HEALTH, ANTIBIOTICS AND MODERN MEDICAL CARE



Notes

1 Kevin McQuillan, "Ontario Mortality Patterns, 1861-1921," *Canadian Studies in Population*, vol. 12 (1985), 32.

2 Robert Bourbeau and Jacques Legare, *Evolution de la Mortalite au Canada et au Quebec, 1831-1931; Essai de mesure par generation* (Montreal, 1982).

3 Ibid., 10; G .A. Condram and E. Crimmins, "A Description and Evaluation of Mortality Data in the Federal Census: 1850-1900:, *Historical Methods*, , vol. 12 (1979), 3-5.

4 *Bourbeau and Legare*, 20, 42.

5 McKeown, *The Modern Rise of World Population* (New York, 1976), 121.

6 H. R. Lentzner, "Adult Mortality Estimates from Successive Censuses: England and Wales in the nineteenth century", *Historical Methods*, vol. 18 (1985), 61.

7 Wrigley and Schofield, *The Population History of England, 1541-1871* (London, 1981), 475.

8 Lloyd Bonfield, et al., *The World We Have Gained* (Oxford, 1987), 259.

9 Sheila R. Johansson, "Sex and Death in Victorian England: An examination of age and sex specific death rates, 1840-1910", in M. Vicinus, ed., *A Widening Sphere: changing roles of Victorian women* (Bloomington Indiana, 1977), 163-4, 169-70.

10 Wrigley & Schofield, *Population History of England*, 109-10.

11 David Ward, *Cities and Immigrants* (New York, 1971), 109-15. See also, Murray W. Nicolson, "Peasants in an Urban Society: the Irish Catholics in Victorian Toronto", in Robert F. Harney, ed., *Gathering Place: Peoples and Neighbourhoods of Toronto, 1834-1945* (Toronto, 1985), 58-9.

12 D. C. Masters, *The Rise of Toronto* (Toronto, 1947), 21, 73.

13 Ibid, 21, 73.

14 However, Nicholson discovered that infants accounted for 39% of the burials in St Michael's and St Paul's in 1855. ('Peasants in an urban Society', *loc. cit.*, 58. This is slightly *lower* than the figures derived from the Necropolis and Potter's Field).

15 Wrigley and Schofield, *Population History of England*, 249, 472, 476. Wrigley and Schofield's figures range between 203 and 277 per thousand. It is impossible to produce comparable figures for Toronto, since we have no birth figures and therefore cannot express the deaths as a proportion of the total population in a given age cohort.

16 M. W. Beaver, "Population, Infant Mortality and Milk", *Population Studies*, vol. 27 (1973), 254.

17 C. Godfrey, *Medicine for Ontario* (Belleville Ont., 1979), 157.

[18] Heather MacDougall, "Health is Wealth: the development of public health activity in Toronto 1834-1890" (University of Toronto, unpublished PhD dissertation, 1982), 405-11.

[19] William McNeill, *Plagues and Peoples* (New York, 1976), 261.

[20] It should be noted that this finding is about 30% higher than the figure given by C. Godfrey in *Medicine for Ontario*, 150. Once the figures from St Michael's Cemetery are tabulated the figure should rise substantially.

[21] G. Bilson, *A Darkened House* (Toronto, 1980), 86, 17, 117; Godfrey, *Medicine for Ontario*, 153.

[22] *Minutes of the Proceedings of the Council of the Corporation of the City of Toronto* (1866), Appendix 11, Report of the Medical Health Officers, 209-10; Eric James Jarvis, "Mid-Victorian Toronto: Panic Policy and Public Response, 1857-1873", (University of Western Ontario, unpublished PhD dissertation, 1979), 236.

[23] F. Jones and D. McCalla, "Toronto Waterworks, 1840-77", *Canadian Historical Review*, 60 (1979), 300-4.

[24] *Annual Report of the Local Board of Health for the Year 1893* (Toronto, 1894), 12.

[25] *Minutes . . . of the City of Toronto* (1866), Appendix 11, 212.

[26] "Public Health in Montreal", in *Medicine in Canadian Society*, ed. S.D.D. Shortt (Montreal, 1981), 395.

[27] MacDougall, "Health is Wealth", 413; T. McKeown, *The Modern Rise of World Population*, 153; P. Herlihy, "Death in Odessa", *Journal of Urban History*, vol. 4 (1978), 432; E. Meeker, "The Improving Health of the United States, 1850-1915", *Exploration in Economic History*, vol. 9 (1971-72), 367-73.

[28] *Shorter Oxford English Dictionary* (1853), quoted in E. Hancock, ed., *Potter's Field Cemetery* (Agincourt: Generation Press; 1983), introduction (unpaginated).