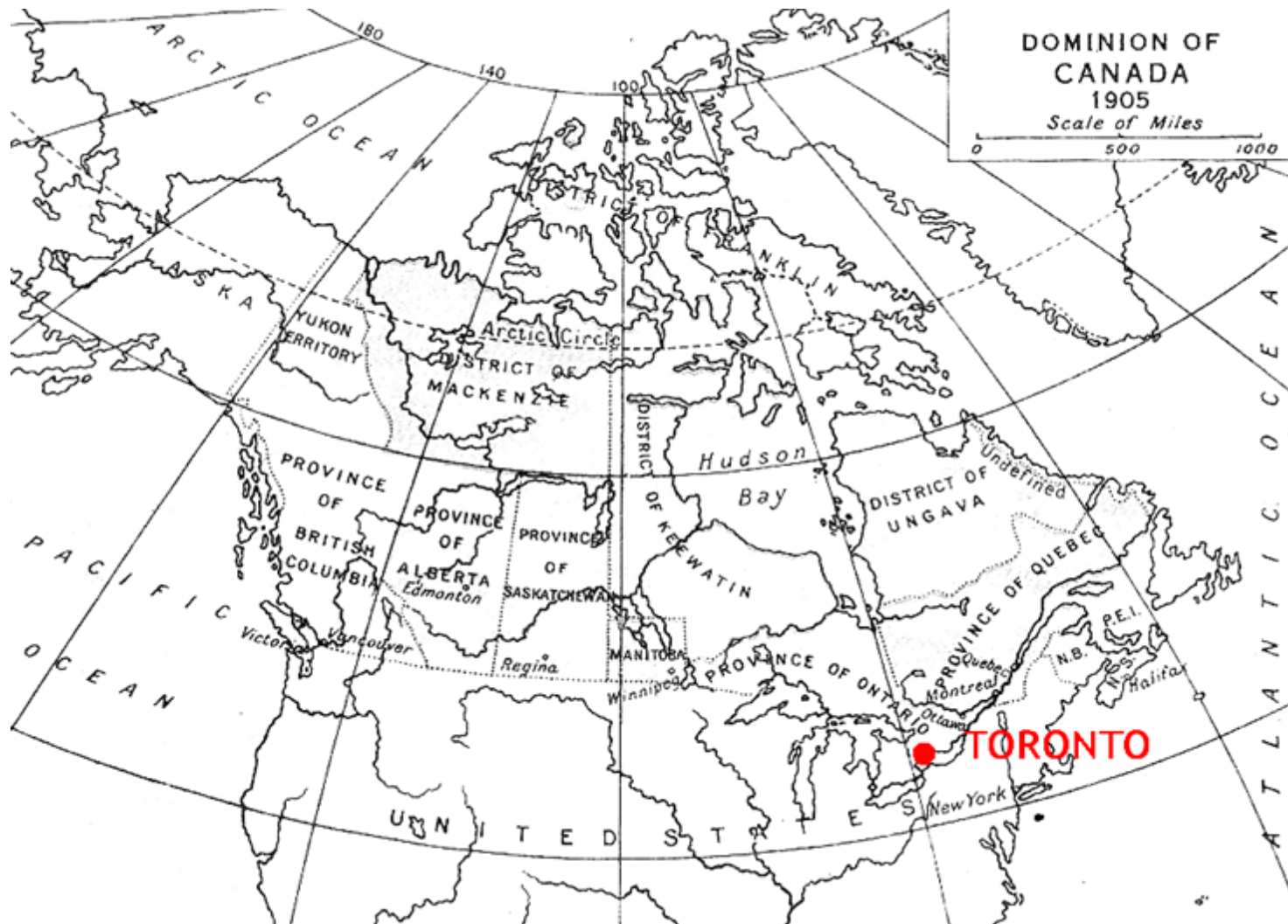


Factors Influencing Infant Mortality in Toronto during the 1918 Influenza Epidemic

Federation of Canadian
Demographers Conference
2 June 2010
Stacey Hallman and Alain Gagnon
University of Western Ontario





Toronto, Canada 1905 (Adapted from John Bartholomew and Son, Ltd [1927: 21]).

Materials

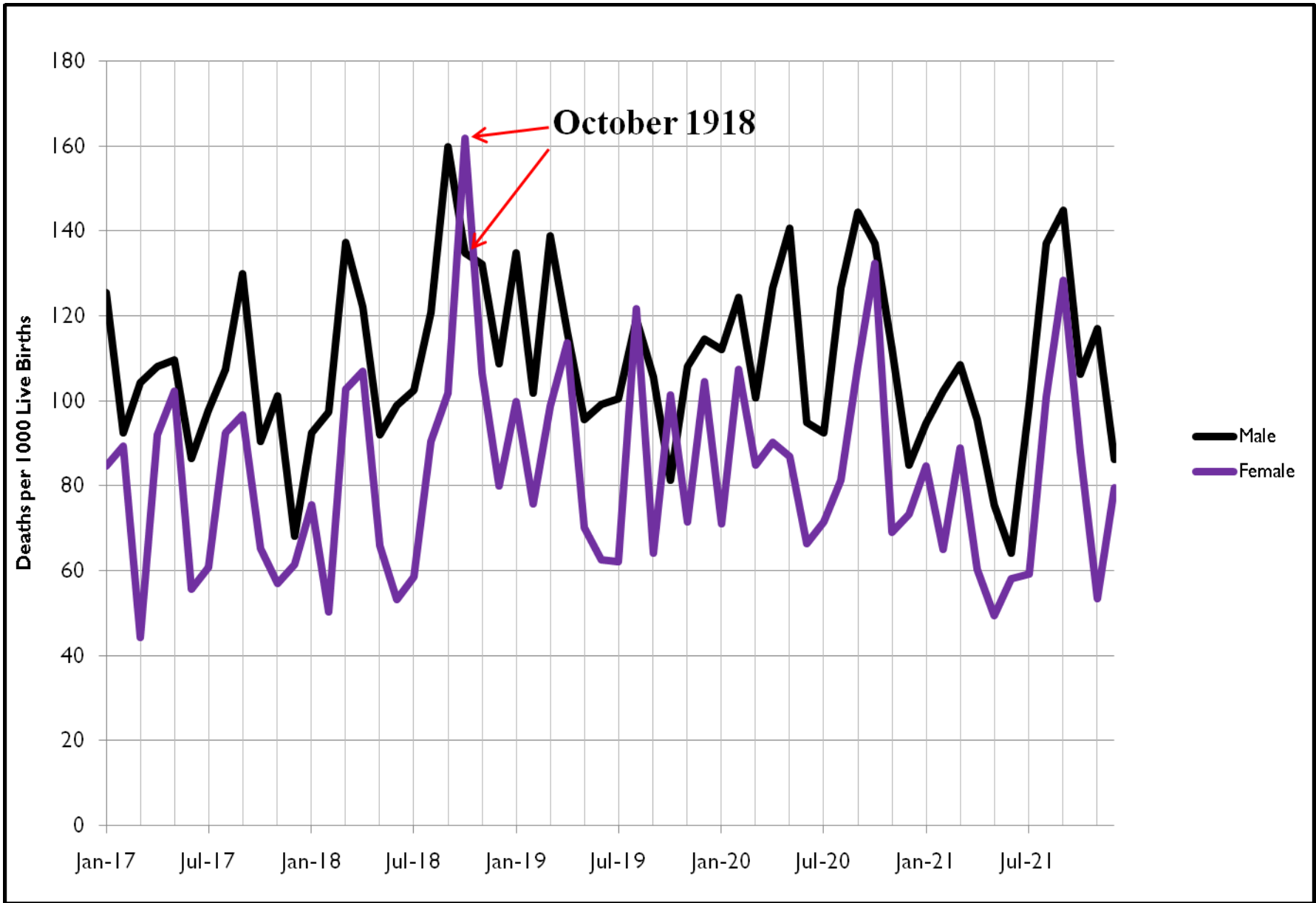


❖ Registered Death Records of the Province of Ontario, 1917-1921 (Archives of Ontario, Toronto, Canada).

- 8952 records, 9016 individuals.
- 5237 male, 3556 female, 223 unknown.
- 2587 neonatal, 3404 postneonatal, 3009 stillborn.

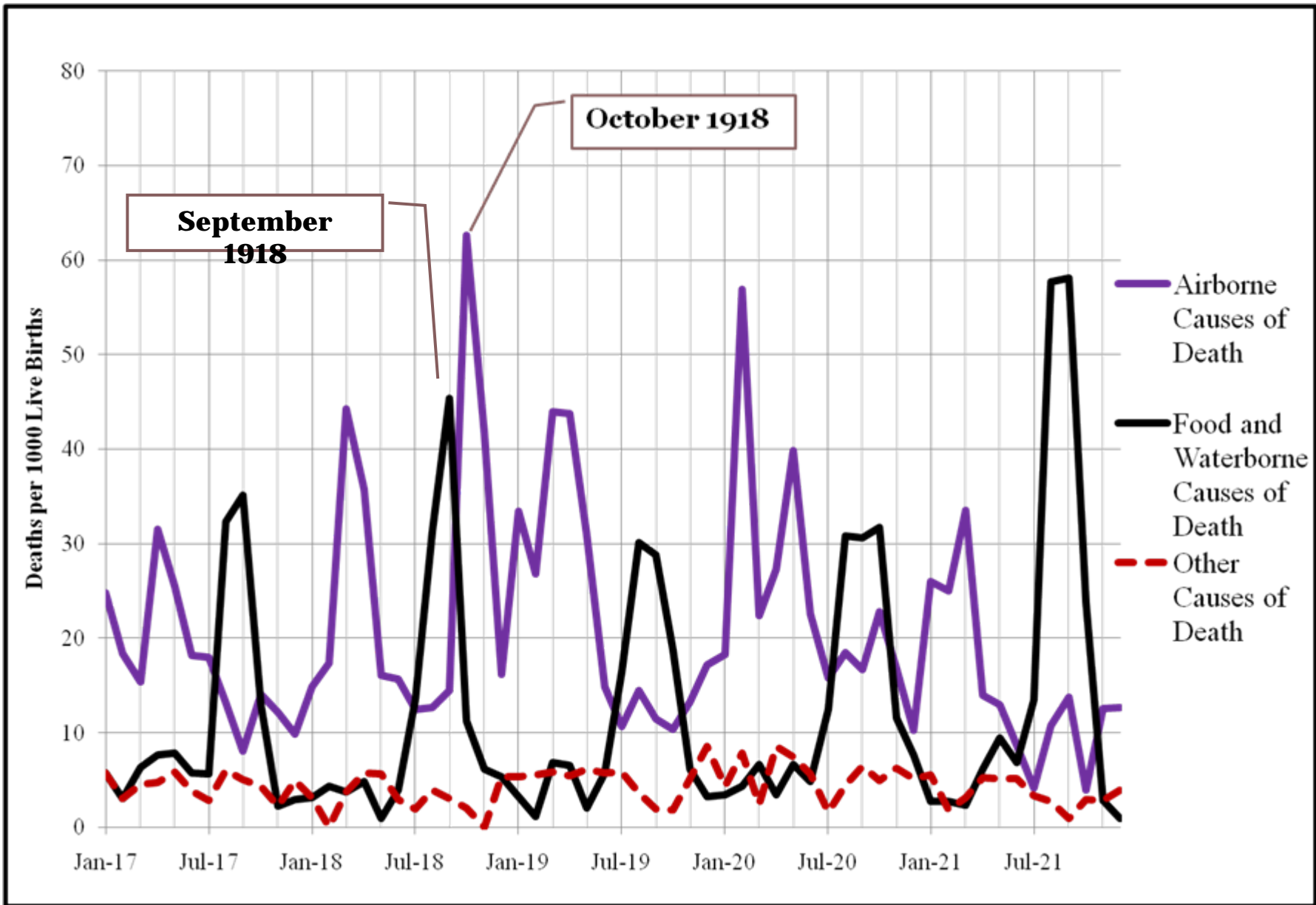
❖ Monthly birth totals from the Sessional Papers of the Legislative Assembly of Ontario (Archives of Ontario, Toronto, Canada).

- 62 222 births.
- 32 348 male, 29 874 female.



Interpretations

- ❖ Lack of a large increase in infant mortality rate not without precedent:
 - United State (Noymer and Garenne 2000).
 - Ontario (McKinnon 1945).
- ❖ However, as of yet there has not been a comprehensive analysis of the pandemic on Toronto.
- ❖ Also, no studies of the pandemic based on infant death records for comparison of the results.
- ❖ Reasons for this finding are unknown.



Differences by Socio-Economic Status?

- Chief Medical Officer of Health: the flu is “spreading most rapidly among the poor” (The Globe, 10 October 1918).
- Sydenstricker 1931, for the 1918 influenza epidemic in the USA:
“There were marked and consistent differences . . . Among persons of different economic status . . . Apparently the lower the economic level the higher was the attack rate. This relationship was found to persist even after allowance had been made for the influence of factors of color, sex, and age, and certain other conditions” (1931:155).
- In Winnipeg: “Influenza was not democratic in its effects; those lower in the social hierarchy suffered greater hardship” (Jones 2007:9).
- MacMurchy of Toronto in 1911:
 - “The rich baby lives – the poor baby dies” (Piva 1979:125).
- However, the flu is often described as “democratic:” it effects people of all socio-economic statuses equally, due to virulence and rapidity of spread (Crosby 1989, Tomkins 1992, Barrett and Brown 2008).

The Sample

- All infants (live and stillborn) who died in October of 1917, 1918 and 1919 in Toronto:
 - 1917: n=120; m=71, f=44, unknown=5
 - 1918: n=207; m=99, f=99, unknown=9
 - 1919: n= 153; m=81, f=68, unknown=4
- A test sample to determine if there are differences in mortality by socioeconomic status, by:
 - Religion
 - Value of building
 - Location of residence

Sources

- Tax Assessment Rolls for three years:
 - 1917 for taxation in 1918
 - 1918 for taxation in 1919
 - 1919 for taxation in 1920
- The 1917-1919 City Directories
- The 1911 Census



Records Linkage

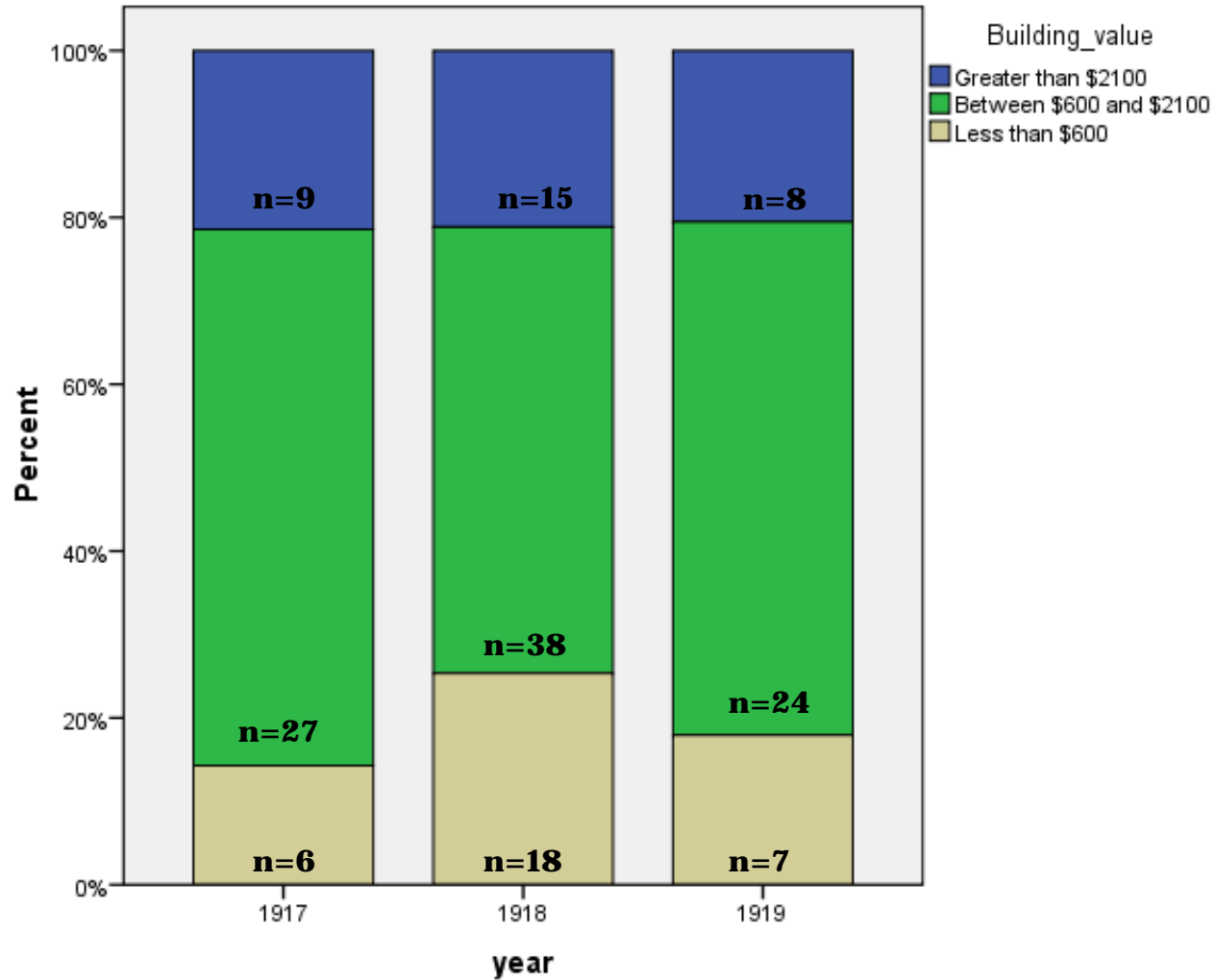
- Used the location of death in the registered death records as the address of residence.
- Of 480 infants, 163 died in hospital.
- Hospital deaths: used city directories to find addresses.
- 341 families were found in the Assessment Rolls (71%).
 - 185 (54%, 39% of the total) were a match for a parent or family member.
- 139 could not be matched.

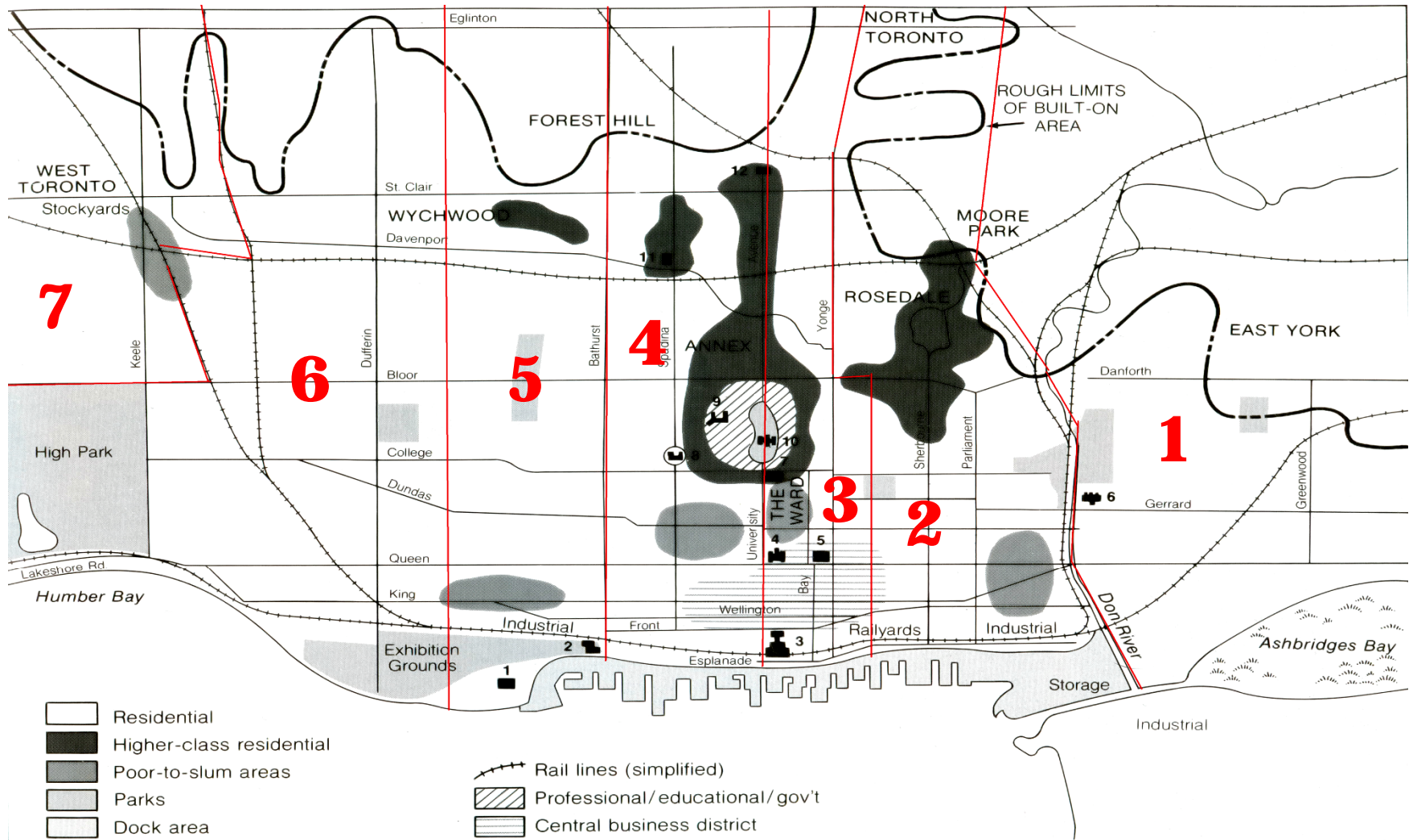
Religion

Religion	1921 Census	Deaths in 1917	Deaths in 1918	Deaths in 1919
Protestant	77.2	77.9 (n=70)	78.7 (n=118)	72.6 (n=77)
a. Anglican	31.0	25.6 (n=23)	27.3 (n=41)	26.7 (n=28)
b. Presbyterian	21.2	15.6 (n=14)	22.7 (n=34)	22.9 (n=24)
c. Methodist	15.7	16.7 (n=15)	18.0 (n=27)	12.4 (n=13)
d. Other Protestant	9.3	10.0 (n=9)	8.0 (n=12)	6.7 (n=7)
<i>e. Baptist</i>		10.0 (n=9)	2.7 (n=4)	4.8 (n=5)
Roman Catholic	13.9	15.6 (n=14)	14.0 (n=21)	21.9 (n=23)
Jewish	8.7	6.7 (n=6)	7.3 (n=11)	4.8 (n=5)
Total	100	100 (n=90)	100 (n=150)	100 (n=105)

Infant Deaths by religion as compared to the religious distribution of the population of Toronto according to the 1921 Census (Piva 1979).

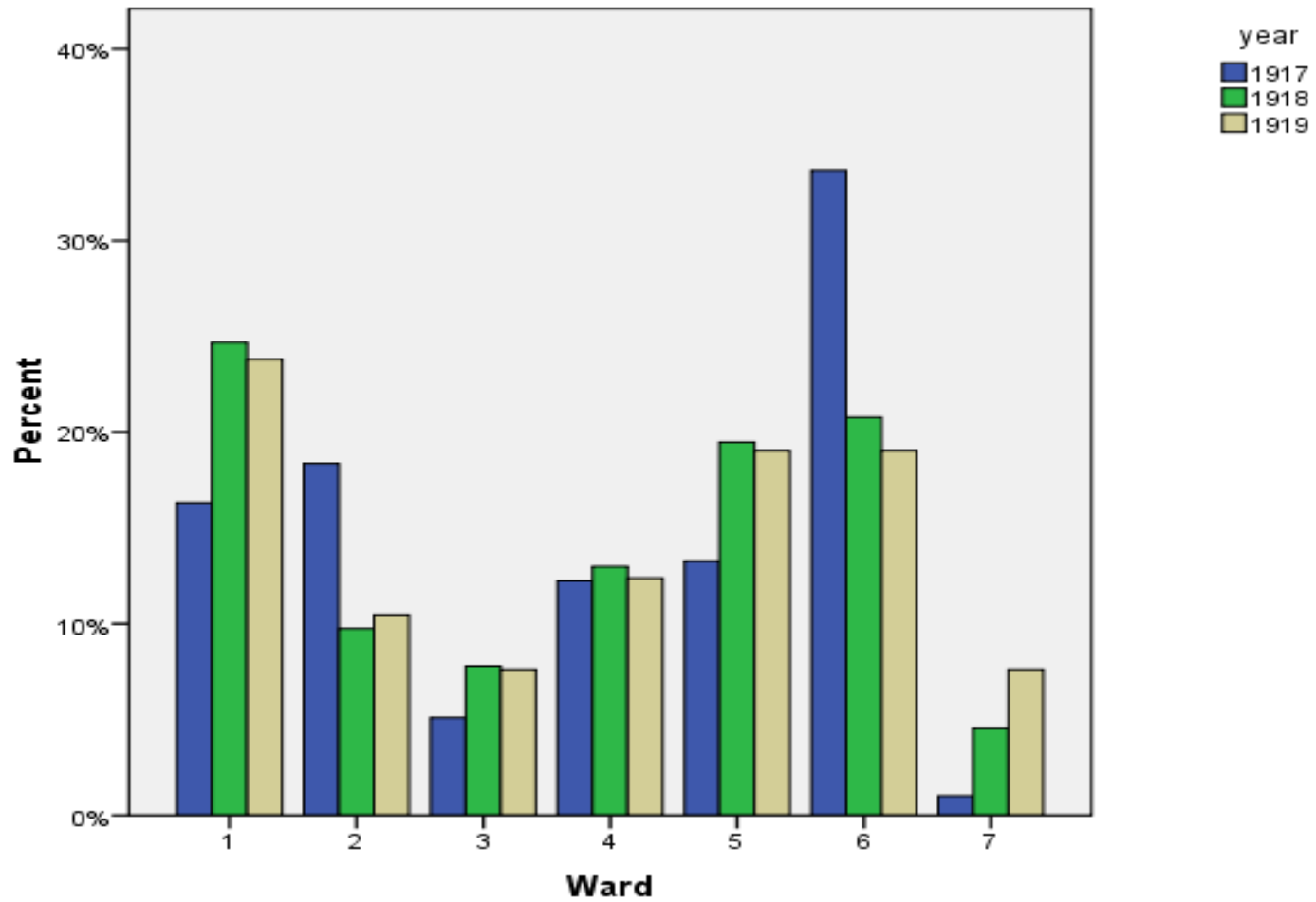
Building Value





Modified from Careless (1984:181), "Toronto by 1915: Land Use"

Ward



Findings

- Increase in infant mortality in October 1918, but not statistically significant.
- Contemporary evidence that the risk of death was not equal for all citizens of Toronto.
- Potential evidence of variations in patterns on infant death by religion, house-size and location within the city.

Further Research

- Extend to the full five year period 1917-1921 and to other Canadian cities.
- Use Geographic Information Systems (GIS) to plot location of death and population totals.
- Determine population and birth rates by ward to calculate expected infant mortality rates.

