A socially neutral disease? Individual social class, household wealth and mortality from Spanish influenza in two socially contrasting parishes in Kristiania 1918–19

Introduction

Studies of historical epidemiology have shown that poor populations suffer more from the burden of disease and death from epidemics, with cholera and tuberculosis being two good examples. However, much of the literature since 1918 has favored the view that the Spanish influenza pandemic of 1918–19 struck victims independent of class or other social indices. This view has prevailed although contemporary household surveys after the 1918 pandemic showed that there were indeed clear differences between the classes in disease incidence and that case fatality rates from influenza and pneumonia also varied according to socioeconomic status.

Method and hypothesis

This analysis is the first to combine multivariate event history analysis with unique individual and household-level data to test the conservative hypothesis that Spanish influenza was a socially neutral disease with respect to mortality.

Data

The analysis uses mortality and census data from two intentionally selected socially contrasting parishes in the Norwegian capital of Kristiania (renamed Oslo in 1924), namely Frogner and Grenland-Wexels. The nominal censuses for 1918 and 1919 used here allow a very close follow-up of individuals from the start of the pandemic in the early spring of 1918 through to the end of it in the winter of 1919. Finally, registration of deaths and the carrying out of the censuses were on the whole undisturbed by the First World War, as Norway was a neutral country.

Results and Conclusion

The figure shows that there is a 19–25 percent lower mortality in the two upper classes vs. the lowest class, but the estimates are not statistically significant. The results also show that there is a partly linear decline in mortality by size of apartment. Households residing in apartments with 2, 3 and 4 rooms, for example, have 34, 41, and 56 percent lower mortality rates, respectively, than those residing in 1-room apartments. Finally, we see from the figure that there is a 49 percent higher mortality rate for those residing in the poor parish of Grenland-Wexels compared with the affluent parish of Frogner, all other factors being the same.

Model

The hazard rate for individual \( i \) with \( n \) covariates, \( X=(X_1, X_2, ..., X_n) \), is modeled as

\[
h_i(t) = h_0(t) e^{\beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n}
\]

\( t \) is time elapsed from 1 February 1918 (\( t=0 \)) to death from Spanish influenza, and \( h_0(t) \) is a hazard function for an individual who scores zero on all \( n \) covariates.

Reference


From: Oslo City Archive, Censuses of 1918 and 1919 for the parishes of Frogner and Grenland-Wexels, and Anmeldte døde i Oslo 1918-21.