Neighborhoods and Child Mortality in an Industrializing Port Town: A Micro-Spatial Analysis of Landskrona, Sweden, 1890-1939

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Extended abstract

The turn of the twentieth century was a period of rapid decline in child mortality and a time of industrialization and urbanization in Sweden. It was also a period of growing social disparities in child mortality. The inequality in child survival was connected to a range of factors, including access to water- and sanitation, housing conditions, infant and childcare, and possibly nutrition. In addition to parental socioeconomic status, neighborhood conditions likely impacted child health through several of these factors. In this paper, we study the importance of the social neighborhood for infant and child mortality in an industrializing port town of southern Sweden during the period 1890-1939, which was the real breakthrough period of Swedish industrialization. We use individual-level socioeconomic and demographic data from population registers which have been geocoded at the block level. Using a k-nearest neighbor approach we construct dynamic measures of social neighborhood conditions from information on social class. In addition, we adjust for physical aspects of the neighborhoods, such as proximity to major industries. We use spatial survival analysis to estimate the association between cumulative social neighborhood variables and the risk of infant and child death, adjusting for parental socioeconomic status. In addition to total mortality, we also analyze cause-specific patterns of broader diagnosis groups, for example, airborne diseases and food- and waterborne diseases.

A previous study of total child mortality in the same area showed how a socioeconomic gradient emerged in child mortality in the second half of the nineteenth century (Dribe & Karlsson 2022). This was clear for both post-neonatal mortality and child mortality, while there were no systematic class differences in neonatal mortality (see figures below). It is well known that neonatal mortality to a large extent is related to complications from pregnancy and birth, and is usually not closely associated with socioeconomic factors. The emergence of class differences in childhood mortality was partly related to the epidemiological transition and to the declining importance of highly virulent infectious diseases (epidemics), such as smallpox, measles, and whooping cough, and instead a dominance of less virulent infections, both airborne (such as tuberculosis and pneumonia) and food- and waterborne (e.g. typhoid, diarrhea). Morbidity and mortality from several of these infectious diseases were more dependent on nutrition, as well as on access to uncontaminated food and water, and crowding. This development may have contributed to a gradual emergence of a mortality gradient by social class.

Later in the nineteenth- and early twentieth century, knowledge about disease transmission improved and active treatment against several of the important diseases developed. This implied increasing possibilities for the socioeconomically more advantaged groups to get ahead in terms of mortality decline, which further increased mortality differentials.

In this paper, we use data for Landskrona between 1890 and 1939. Landskrona is a mid-sized industrial port town in southern Sweden, and although it is not statistically representative of Sweden, it experienced similar social, demographic, and economic developments as other comparable cities in the country during the period under study (Dribe & Svensson 2024). The city went through an industrial expansion from early in the twentieth century connected to shipbuilding, food processing, and textiles. In 1900, Landskrona had a population of about 14,000, which increased to 20,000 by 1940.

Landskrona was in many ways a typical working-class town. Average income and the level of education were lower than in most Swedish cities but trends in income inequality broadly coincided with the national trends, at least for the periods when they can be compared (see Brea-Martinez & Dribe, 2024).

The data come from the Scanian Economic-Demographic Database (SEDD) (Bengtsson et al. 2021; Dribe and Quaranta 2020). The sources are continuous population registers linked to income and taxation registers. SEDD contains information on births, marriages, deaths, occupations, and in- and out-migrations. We use a spell-based extraction from the database (Quaranta, 2015, 2016) to which we add neighborhood data. Neighborhoods are created from geocoded street blocks from the population registers 1890-1939, reconstructed using historical maps and aerial photos from Landskrona City Archives and the Land Survey. We can continuously follow the residential histories of all individuals in the town.

We measure socioeconomic status by social class (HISCLASS, Van Leeuwen & Maas 2011) which in turn is derived from HISCO-coded occupations (Van Leeuwen et al. 2002). Class origin is based on father's occupation and grouped in four classes: White-collar high (higher professionals and managers), white-collar low (lower professionals, lower managers, clerical and sales personnel), blue-collar high (skilled workers), and blue-collar low (low- and unskilled workers).

For the neighborhood social context, we construct variables at the block level, incorporating adjacent or nearby blocks to calculate a spatially weighted neighborhood social class. This spatial lag variable helps us to mitigate some potential biases in the estimates (Kwan 2012). We construct these neighborhood measures bi-annually and measure the neighborhood social class of surrounding same-aged children and adults separately. From these measures, we derive the geographically weighted (GW) share of the neighbors' social class. In our sensitivity analysis, we study neighborhoods of different sizes and characteristics. For the same-aged neighbors, social class refers to one of the parents of the child neighbor, usually the father (for more details, see Hedefalk and Dribe 2020).

The statistical analysis is made using Cox proportional hazards models of the risk of death. We adjust for birth year, birthplace, family context, class, and physical characteristics of the neighborhood (population density, building type, building density, and distance to major industry). In the analysis of cause-specific child mortality we use a competing-risk proportional hazards model on groups of causes of death. The coding of cause of death is based on the historical adaptation of IDC-10 (Janssens 2021).

Figures (Dribe and Karlsson 2022)

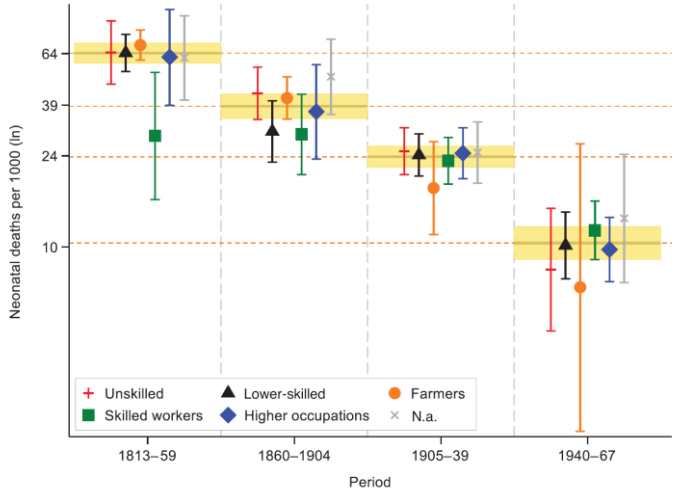

FIGURE 3 Neonatal mortality ratios by social class and period. See fig. 2. *Source:* See tab. 1 [Colour figure can be viewed at wileyonlinelibrary.com]

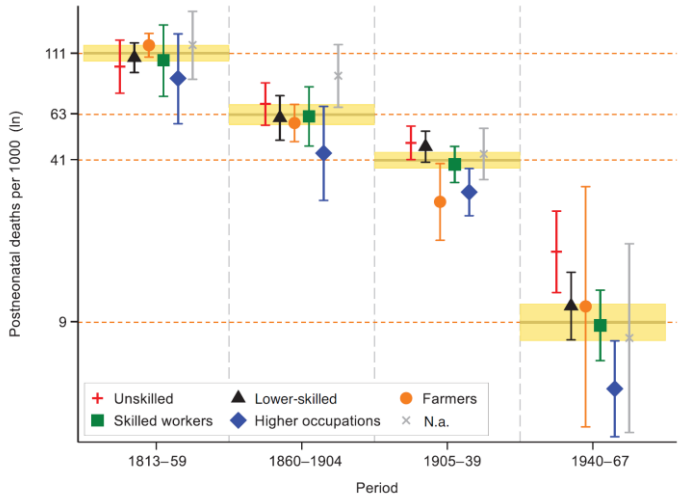

FIGURE 4 Post-neonatal mortality ratios by social class and period. See fig. 2. *Source:* See tab. 1 [Colour figure can be viewed at wileyonlinelibrary.com]

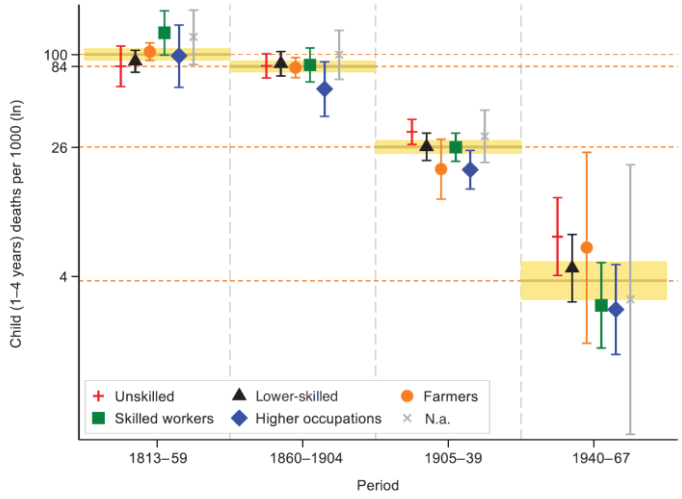

FIGURE 5 Child (1–4 years) mortality ratios by social class and period. See fig. 2. *Source:* See tab. 1 [Colour figure can be viewed at wileyonlinelibrary.com]

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