Explorations in Economic History 48 (2011) 207–225

Contents lists available at ScienceDirect

Explorations in Economic History

journal homepage: www.elsevier.com/locate/eeh

The health cost of living in a city: The case of France at the end of the 19th century

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ARTICLE INFO

Article history:
Received 25 March 2010
Available online 23 December 2010

JEL classification:
I18
N33
N93

Keywords:
Migration
Health
Differential mortality
Rural–urban gap
France

ABSTRACT

Despite a long standing debate over urban living conditions during industrialization, the impact of rural–urban migrations on health and mortality remains an open question. We observe both mortality and geographical mobility in a large longitudinal dataset of French males and show that rural–urban migrants benefited from clear advantages over those who already lived in the city. However, this benefit fades in a few years. Further we find no evidence of a spike in mortality among rural migrants as they encountered the more severe disease environment of cities, instead it seems their initially superior physical human capital was depleted over time.

1. Introduction: standards of living and local health conditions

That cities suffered higher mortality than rural areas was a commonplace among nineteenth century social scientists (Vedrenne-Villeneuve, 1961). As early as the eighteenth century, scholars had used differences between monks' mortality and that of 'ordinary' people to show that mortality differs by social and economic conditions (Moheau, 1994 [1778]). Nineteenth century researchers also pointed out the awful living conditions in cities and the very high mortality that prevailed there (Villermé, 1830). However, the role of different factors in the urban–rural gap were unknown. Then, the causes most frequently put forward were overpopulation, poor housing conditions, bad water supply, slope of the land and, of course, poverty. More recent studies have also pointed out that industrialization itself was partly responsible for higher mortality in cities (Landers, 1993: especially chapter 7; Vögele, 1998; Woods, 2000: chapter 8). Not only did cities offer worse living conditions –quality of housing, of food or the disease environment– but working conditions were much harder than in the countryside (Gaspari and Woolf, 1985; Neven, 1997; Szreter and Mooney, 1998).

More broadly we can contrast two views about high urban mortality. One view sees high urban mortality as the consequence of a very low stock of urban infrastructure combined with a high influx of poor migrants. The lack of clean water, healthy food and decent housing meant that cities were very crowded and hazardous. At the same time work was both long and physically taxing for much of the population. Although these living conditions would improve with economic growth, they may have worsened in the initial decades of industrialization (Williamson, 1982; Steckel, 1995; Steckel and Floud, 1997; Komlos, 1998). Most scholars now agree that there was indeed a sharp decline in health during industrialization (Haines, 2004) but that long-term health

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doi:10.1016/j.eeh.2010.12.002

conditions improved much more. In other words, the initial cost of industrialization on health was, on a middle and long run basis, more than compensated (Galloway, 1985; Fogel, 2004). The arguments about the low quality of the urban infrastructure extend directly to the health stock of the population. There is a growing literature dealing with the consequences of early life conditions on mortality (Fogel, 1986; Bengtsson and Lindström, 2000; Hong, 2007). It shows that poor living conditions during childhood have negative effects on later life (Elo and Preston, 1992). Just how this specific effect interacts with later mortality differentials remain an open question. In other words, we may wonder what part of the urban–rural mortality differential is due to an adverse environment. To begin with, those born and raised in cities may die at high rates at any age because of poor living conditions in their youth. Those who grew up in the city and survived until 20 years old, however, are heavily selected and may be strong enough to survive longer in the harsh urban environment.

The second approach focuses more directly on the disease environment, as it is well known that most diseases remain endemic in cities. Considering the causes of mortality, Kuagbenou and Biraben conclude that "two-thirds of the deaths were linked to infectious or parasitic disease" in Paris in the 1840s (Kuagbenou and Biraben, 1998: 37). Hence the higher mortality of cities could have come from a higher morbidity that was itself the result of the higher prevalence of infectious diseases. The argument about overall mortality in urban areas has implications for migrants as well. Indeed, some scholars argue for an immunization process: cities attracted people from different regions, each carrying a different disease and different acquired immunities (Lee, 1997; Costa, 2003). Prior exposure reduces the chances of dying later in life from infectious diseases; hence the higher urban mortality in cities may result from the high migration rate to and within cities. In this view, migrants to cities had to confront communicable diseases and their low prior exposure implied a lack of immunity and consequent higher mortality.

Evaluating these hypotheses can help us understand the urban mortality transition: the process in which mortality rates in cities fell below those of rural areas. Was the fall of mortality due to sanitation improvements (Ferrie and Troesken, 2008) or to the diminishing impact of chronic disease (Costa, 2002)? Yet because of problems of selection bias as well as the complex patterns induced by migration, analyses of the comparative mortality of migrants and stayers are very limited. In fact, few studies, if any, have tackled these issues despite the well known importance of migration flows and rural–urban mortality differentials. Without high urbanization and mortality rates the history of the industrial revolution would have been very different and so would the history of the health transition.

Most of the research in these issues has focused on the U.S. in the late nineteenth century based on the Union Army veterans dataset (e.g Cain and Hong 2009). Although both the initial urban mortality penalty and the urban mortality transition are general phenomena, the U.S. and its Union Army veterans lie at one extreme of the circumstances under which urban rural mortality evolved in the later nineteenth century. First U.S. cities were heavily populated with international immigrants, perhaps exacerbating the immunization effect. Second, U.S. rural populations were not nearly as dense as in Europe. Finally, veterans of the Union Army had endured war conditions far harsher that those of other conscripts in the relatively peaceful period between 1870 and 1914. It does seem worthwhile to examine at least one different society where we can quantify urban–rural mortality differences.

We do so for France, at roughly the same time. In the aggregate, France shares a number of similarities with the U.S. and other industrialized countries: first mortality rates increased with settlement size (Tugault, 1973: 32). Moreover, the slope of death attributed to non-infectious diseases has the opposite sign to that of infectious diseases (Table 1). Where tuberculosis, typhoid and other diseases kill at ever higher rates as settlement size increased, the reverse was true for other causes of death which decreased with settlement size. This evidence is inconclusive because it does not control for age or gender. The relatively low mortality of Paris for instance will disappear when we use more comparable populations. But the data are ambiguous in terms of our two hypotheses, as it could be that cities had higher mortality due to higher prevalence of diseases or due to more severe consequences of falling ill because of poor living conditions.

Table 1
Mortality in France by cause and municipality size.
Source: Annuaire statistique de la France 1895–1896.

Population of cities	Mortality rate	Mortality from infectious diseases	Mortality from other causes
Paris	21.84	11.73	10.11
More than 100,000, other than Paris	26.13	13.79	12.34
Between 99,999 and 30,000	25.64	12.45	13.19
Between 29,999 and 20,000	24.46	11.77	12.69
Between 19,999 and 10,000	25.33	11.06	14.27
Between 9,999 and 5,000	24.27	9.93	14.34
Chef lieu with less than 10,000	22.79	8.19	14.60
Other municipalities	21.70	NA	NA

The data for mortality rates by settlement size and cause of death was reported only for canton chef-lieux (the administrative seat of the territorial jurisdiction just above the municipality). Nearly all towns with a population greater than 10,000 were chef-lieux and the localities that reported cause of death comprised a third of the French population. We computed the mortality rate for other localities from the French aggregates.
Infectious diseases include: typhoid, typhus, small pox, rubella, scarlet fever, mumps, diphteria, pulmonary infection, tuberculosis, meningitis, bronchitis, pneumonia, diarrhea, cholera, postpartum fevers and infections. Non-infectious diseases include: cancers and tumor, cerebral hemorrhages, paralysis, cerebral decline, heart disease, senility, suicides and other violent deaths, and other causes, including unknown. Other causes including unknown is about 40% of the total non-infectious diseases but are not related to settlement size.