

Sex differences in mortality by ethnic background

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Abstract

In the Nordic countries the female survival advantage has been observed at least since the middle of the 18th century. The extent of the gender gap in mortality is varying substantially between countries. Denmark and Sweden are considered countries with a small gender gap in mortality. In this study we address whether the substantial differences in the gender gap that are observed between countries can also be observed for different immigrant groups. Previous research has indicated that migrants enjoy better health and lower mortality compared with the host population. Considering the healthy migrant effect and predominantly male migration from non-Western countries to Denmark and Sweden in 1960-70s, as well as high fertility in their female spouses, we expect to find smaller sex differential mortality among migrants than in the ethnic Danish and Swedish populations. We use high-quality register data covering the whole Danish and Swedish population over several decades to address our research question.

Background

At least since the middle of the 18th century, when the first Swedish life tables by sex were constructed, it has been known that on average women live longer than their male counterparts. Research has shown that both biological and social/behavioral differences contribute to the gender gap in mortality [1, 2]. Among the most industrialized countries we have observed many similarities in trends of sex differential mortality. During the 20th century the gender gap increased continuously and since the beginning of the 1980s it has been slowly narrowing. Despite these similarities, studies have shown that the extent of the female survival advantage differs substantially across countries. Denmark and Sweden are considered to be the countries with small gender differences in mortality. This study seeks to address whether this is also true for different immigrant groups in Sweden and Denmark.

Previous research has indicated that migrants enjoy better health and lower mortality compared with the host country population, so called healthy migrant effect [3-5]. The most commonly cited explanation for this phenomena suggest that those who migrate have to be fit enough to make the effort and survive the trip, adapt to new life circumstances and often new culture, and work hard in the host country [6]. Moreover, most countries require applicants for labor migration to undergo a thorough medical examination that leads straightforwardly to the selection of healthier individuals to enter the host country. Some studies have suggested that health advantage in migrants diminishes over time, at older ages, and in the second degree migrants [7, 8]. In addition, mortality differences in immigrants versus national population may differ substantially by cause of death and country of birth [9-11].

Some studies have indicated that migrants have worse general health and physical function and higher risks of long-term illness than their native-born counterparts [12-15]. Socio-economic inequalities, adaptation abilities, and discrimination were proposed to explain these differences. However, in some host countries, e.g. the US, Germany, France, migrants were found to have survival and health advantage despite lower socio-economic conditions [16-18], so called Latin paradox. Several methodological problems were suggested to explain the Latin paradox, such as remigration of unhealthy persons to the origin country at old ages (salmon bias), underestimation of mortality of foreigners due to biased death numerator and population denominator [19-21].

A substantial migration to Denmark started in 1960s and involved mainly male labor migrants from Turkey, Pakistan, and Yugoslavia. Lower mortality rates among immigrants than in the host country populations have been found in Denmark [22] and other Scandinavian countries [5, 19]. However, some studies indicated higher use of emergency care, prevalence of self-reported mental health problems, and worse perceived health in some immigrant groups primarily from non-Western countries compared with ethnic population in Denmark and Sweden [14, 23-25]. Despite worse health, immigrants were absent from work less often and had healthier lifestyle in terms of alcohol and vegetable consumption than the citizens with Danish background [26, 27]. Immigrant women were found to have higher fertility rates, but also higher risk of stillbirth and higher infant and under-five child mortality compared with ethnic Danish women [22, 28, 29].

Research Question

Only few studies investigated mortality in migrant population by gender [15, 25]. Little is known about the magnitude of sex differential mortality in migrants compared with ethnic Danes and Swedes. Thus, we propose to look at ethnic differences in survival through the lens of gender. We focus primarily on labor migration as this group is expected to be different from other migrant groups with respect to health status at the time of migration and motivations to emigrate from the home country and assimilate in a new country. Considering healthy migrant effect and predominantly male migration from non-Western countries to Denmark and Sweden in 1960-70s, as well as high fertility in their female spouses, we expect to find smaller sex differential mortality among migrants than in the ethnic Danish and Swedish populations. We expect to find slightly smaller or similar sex differences in survival in migrants from Western countries and native-born Danes or Swedes.

Data and Methods

Denmark and Sweden maintain systematically organized databases, called registers that contain the information on a wide variety of the population characteristics, with nationwide coverage and a very low percentage of missing data. Several registers will be used to in the present study, including the total population register, the migration registers, the cause of death registers, as

well as other registers with socio demographic information. For Sweden, data access has been established. For Denmark, the data application procedure has been initiated.

In this study we use hazard regression models to examine the influence of various predictors on the individual's mortality. Hazard regression, also called event-history analysis or survival analysis, represents the most suitable analytical framework for studying the time-to-failure distribution of events of individuals over their life course. The failure event in our analysis is the death of the individual. The baseline hazard of our model $h_0(t)$ is age and is assumed to follow a Gompertz distribution. The Gompertz distribution, proposed by Benjamin Gompertz in 1825, has been widely used by demographers to model human mortality data. Gender differences in mortality are tested through interaction models with gender, ethnicity and the interactions between gender and ethnicity as main independent variables of interest.

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