

# Historical demography

**Strand organizer: Hannaliis Jaadla (University of Cambridge)**

**Britain's mortality transition session convener: Eilidh Garrett (University of Edinburgh)**

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**Historical demography: New perspectives on historical mortality patterns – Monday 9 September, 4.45pm**

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## **The demographic foundations of the lived experience of kin death**

***Diego Alburez-Gutierrez, Emilio Zagheni***

***Max Planck Institute for Demographic Research, Germany***

The last two centuries have been marked by increases in life expectancy, reductions in family size and changes in the timing of fertility. We analyse how demographic change has altered individuals' lived experience of death during the lifetime. A first analysis draws upon historical and projected age-specific vital rates for Sweden and uses formal demographic analysis to measure trends in the extent and timing of child loss, in the average age at first experience of death of a maternal kin member, and in the type of kin death experienced. A second analysis compares the model predictions with data from user-generated online genealogical communities. Ongoing analyses do the same, drawing on the Swedish Multigenerational Register. Our results indicate a considerable reduction in child loss across cohorts, an increase in the average age at first experience of maternal kin death, and a shift in the first death experience, from that of a sister, mother, or aunt to that of a grandmother. These transformations of the life course have profound implications for the health and well-being of individuals and families.

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## **A breakpoint analysis of health transitions in England compared with the Nordic Countries**

***Catalina Torres, Jim Oeppen***

***Interdisciplinary Center on Population Dynamics (CPop), University of Southern Denmark***

The Nordic countries are a natural basis for comparison when assessing the modern rise in life expectancy in England. Although the Nordic countries were pioneers in the collection of demographic data, reliable annual estimates of  $e_0$  start relatively late in some of these countries when one is interested in the complete process of modern mortality decline. For instance, by the time that reliable estimates from the Human Mortality Database (HMD) become available, there is reason to believe that gains in survival had already started in some countries. Among the countries with the maximum recorded levels in life expectancy at birth,  $e_0$ , the Scandinavian region occupies a prominent place, as Norway, Sweden, Denmark, and later Iceland too have been frequently in the top positions from the 19th century. Here we extend the annual time series of  $e_0$  estimates for our Nordic populations back in time before the HMD, using a simple indirect method. Using these extended series and the Health Transition as theoretical framework, we compare England's progress with the Nordic countries (including Finland), from the mid-18th century until today. The phases of the health transition in each country are identified with a breakpoint analysis and this is complemented with information about the timing of major events with potential impacts on population health. We find that not all countries went through the same phases of the transition. Additionally, similar events occur close to the identified breakpoints, regardless of the timing of the latter or the duration of the phases.

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## **A two-parameter hazard function to fit historic mortality patterns**

***Hugo J P La Poutre***

***Economic and Social History section, University of Groningen, The Netherlands***

When describing mortality patterns of ancient populations, one is often confronted with small sample sizes, or with missing data on several age groups. In such cases, a hazard function that covers the whole age range can be used to correct for capriciousness due to sample size, and to fill the gaps. Which function is capable of describing the mortality pattern accurately, and is restrictive enough to correct for capricious data at the same time? To relate to both adults and children, this paper introduces an extension of the hazard function for adults as proposed by Thatcher (1999). Tested against a large collection of life tables from the 17th to the 21st centuries, the new model is found to fit the data well. However, since this model contains five parameters, it is more flexible than desired. In order to meet the need for a restrictive model, the number of parameters is reduced from five to only two. This two-parameter model can be fitted to the aforementioned set of life tables almost as accurately as the five-parameter model.

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### **Historical demography of England & Wales – Tuesday 10 September, 9.00am**

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## **Wealth and adult male height in late 18th century Dorset**

***Hannaliis Jaadla, Romola Davenport***

***University of Cambridge***

In this paper, we investigate the relationship between relative wealth and height for men recorded in the Dorset Ballot lists in the 1790s. We also aim to explore the influence of local communities and urban-rural environments on physical stature. Height has very often been used as a primary measure to assess health and health inequalities in the past. However, most of the previous historical research relies on heights recorded by institutions, especially armed services or prisons. This has led to understandable concerns about the quality of height data, where the height requirement imposed by many armed services results in the left truncation in the distribution and the changing selection effects regarding criminality or self-selection into military service may have affected the underlying distributions. In this paper, we use a unique data source that represents the full height and social distributions of adult males between ages 18 and 45 in Dorset in the late 18th century. The preliminary findings suggest that there are significant differences in height by relative wealth, but also that this relationship was modified by urban residence.

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## **The decline of infant mortality in England and Wales, 1912–39**

***Romola Davenport***

***University of Cambridge***

Secular improvements in childhood and young adult mortality in England and Wales are discernible from circa 1870 at the national level. However infant survival did not rise markedly until after 1900, and improvements were confined to post-neonatal ages until the late 1930s. Infant diarrhoeal mortality, a major contributor to excess urban mortality, also showed no marked decline until the second decade of the 20th century. These patterns present a puzzle, because many of the factors assumed to affect infant health, including maternal health, urban sewage disposal and water quality, improved

markedly before 1900. Most studies of infant mortality in England and Wales address the period circa 1850–1911, when the Registrar General reported mortality data in a fairly consistent format for a relatively stable set of administrative units. The format and units of reporting were altered substantially in 1912, and this has led to a relative neglect of the interwar period. This is unfortunate, because this period witnessed very large falls in mortality, especially for infants. Here we use data on births and deaths from the annual reports of the Registrar General to study infant mortality by age, sex and legitimacy status over the period 1912–39, for rural and urban districts within England and Wales. We report the geography of infant mortality, and the timing and geography of changes in the age structure of infant mortality, as well as changes in the size and age pattern of the survival disadvantage of illegitimacy.

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## **Premarital sexual activity and marital fertility during the first demographic transition in England and Wales**

*Alice Reid<sup>1</sup>, Eilidh Garrett<sup>2</sup>, Hannaliis Jaadla<sup>1</sup>*

<sup>1</sup>*University of Cambridge*, <sup>2</sup>*University of Edinburgh*

This paper will examine the influence of premarital sexual activity and marriage patterns on pre-nuptial pregnancy, age-specific marital fertility and illegitimacy between 1851 and 1911 in England and Wales. This period witnessed the start of the first demographic transition: fertility was declining both within and outwith marriage: overall marital fertility started to decline from the 1870s or 1880s, and illegitimate fertility from 1851 or before. Delayed marriage also contributed to declines in overall fertility. Of all of these factors, falling marital fertility contributed most to lower overall fertility, and fertility declined among all women in age groups above the mean age at marriage (mid-20s upwards). Among women in their early twenties, however, marital fertility rates increased sharply. We hypothesize that increasing marital fertility rates among young women were due to the increasing selection of pre-nuptially pregnant women into marriage. Two factors contributed to this; on the one hand, the increasing demands of Victorian respectability increased the likelihood that unmarried pregnant women would marry before the birth of their child, transforming potentially illegitimate births into pre-nuptially conceived but legitimate births. On the other hand, with increasing marriage age these women will form a higher proportion of married women in their early twenties. Our paper will explore plausible levels of exposure to pre-nuptial sexual activity and marriage chances of unmarried pregnant women which would be consistent with observed patterns and changes in illegitimacy, nuptiality and age-specific marital fertility in England and Wales. We will test our theories using longitudinal data from Kilmarnock, 1861–1901, and Ipswich, 1871–1911.

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## **Britain's mortality transition – Tuesday 10 September, 4.45pm**

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### **Analysing the decline of English mortality from Big Data; 90 million individual records 1838–2007**

*Neil Cummins*

*London School of Economics*

Recent scholarship on the historical US (Anderson et al. 2019) questions the effects of public health measures in reducing infant mortality. For the UK, the debate is also unsettled as Szreter's critique (2005) of the McKeown hypothesis (1976)

illustrates. I analyse a new dataset of every English birth and death from 1838 to 2007 to test competing hypotheses concerning the decline of adult and infant mortality in England and Wales. The underlying data is individual, allowing me to stratify the data by sex, ethnicity and economic status (as revealed from surnames).

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## **Determinants of temporal and seasonal patterns of infant and child mortality in Scotland, 1900–73**

***Beata Nowok, Chris Dibben***

***University of Edinburgh, Administrative Data Research Centre***

At the beginning of the 20th century, deaths of children dying before their fifth birthday accounted for more than 30% of all deaths in Scotland and by 1973 this share had dropped to around 2%. When a similar comparison is made for the seasonality, as expressed as an excess winter mortality index (EWM), a very different pattern is observed. Relatively low excess rates at the beginning and end of the period are strongly contrasted to high rates in the 1920s and 1930s. This pattern in the 1920s and 1930s appears to be associated with outbreaks of severe seasonal influenza. During this period the EWM for the youngest was even higher than for the oldest age groups. Geographically disaggregated time series show that the Western lowlands region (the region incorporating the industrial Greater Glasgow area) was driving this pattern at the national level. In this paper we use linked individual level data from birth and death certificates to explore demographic, environmental, socio-economic and cultural factors that affect infant and child risks of dying. In order to consider the complexity and age-specificity of the determinants of infant survival, we look at different phases of infant and child life separately.

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## **Tracing the epidemiological transition in the deaths occurring on the Isle of Skye, Scotland, 1861–1970**

***Eilidh Garrett<sup>1</sup>, Alice Reid<sup>2</sup>, Lee Williamson<sup>1</sup>, Chris Dibben<sup>1</sup>***

***<sup>1</sup>University of Edinburgh, <sup>2</sup>University of Cambridge***

Omran's theory of the Epidemiological Transition is central to much academic thinking on the mortality transition and demographers across the world have long wished to trace the evolution of mortality decline using the causes of death given on individual death certificates, as the interpretation of published statistics is hampered due to the details of the registration practices, medical nosologies, and clerical classification schemes used in their compilation being seldom fully known. The Digitising Scotland (DS) project is transcribing the contents of all certificates of birth, marriage and death registered in Scotland between 1856 and 1970, including the date and cause of each death as well as the sex and age at death of the deceased. While DS aims to investigate all deaths within the study period, this paper will report on an initial exploration of the deaths occurring on the Isle of Skye, Scotland. The paper will focus on the coding and interpretation of cause of death. It will use a coding scheme, devised for use with the DS project, which is based on the WHO International Statistical Classification of Diseases (ICD10) with additions to cover causes of death encountered in historical records. This schema will be used to monitor changes in the way that causes of death were described and to follow the evolution of the epidemiological transition on Skye as it unfolded over 110 years.

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