Historical demography strand

Strand organisers: Dr. Alice Reid, Dr. Hanna Jaadla (University of Cambridge)

Historical demography: census-based research. Tuesday 15 September 11.00am

Education, geography and fertility decline: Evidence from 1970 Colombia - *Juliana Jaramillo Echeverri, London School of Economics*

Colombia experienced one of the fastest declines in fertility in the world: children per woman fell from 7 in 1960 to 3 in 1985. However, the regional character of the decline has been neglected in previous research. This paper provides a detailed empirical perspective of the geographical variation of Colombia's fertility decline. My empirical analysis draws on individual-level data from the complete census of 1973. Using the Own Child Method, I estimate age-specific and total fertility rates disaggregated by education levels and marital status for women between 13 and 52 years old, at the regional level. Comparing women born across time and space, I observe women born between 1910-1920. The results show that women born in the 1910s and located in the Andean region had on average one fewer child than the average woman born in the same period. By the time of the fertility transition these women had completed their fertility life, which means that lower fertility levels predate the fertility decline. Using Local Indicators of Spatial Association -- LISA, I find supporting evidence of geographical clusters of low fertility in the Andean region and in Nariño, for women with completed fertility. Clusters of high-fertility are localized in the departments of Antioquia, Boyaca, Caldas, Cesar, Caqueta, La Guajira and Valle del Cauca. I argue that the differences in fertility levels and its evolution are related to two important regional characteristics: the economic structure of the region, and its socio-cultural norms.

Email: j.jaramillo1@lse.ac.uk

Continuity and change in spatial patterns in UK fertility: the case of London - *Hannaliis Jaadla[1], Alice Reid[1], Eilidh Garrett[2]; [1]University of Cambridge, [2]University of Edinburgh*

In 2018 the Borough of Camden in north London had a Total Fertility Rate (TFR) of 1.10 children per woman, the lowest TFR of all local authorities in England and Wales, while Barking and Dagenham in east London had the highest at 2.28 (ONS Birth Summary Tables 2018). It is striking that this strong east-west pattern in London's fertility has persisted for at least 150 years: the fertility decline which formed part of the first demographic transition is generally not thought to have started until the 1870s, but in 1851 Mayfair in London already had below replacement fertility but many areas of east London had TFRs of over five children per woman (PopulationsPast.org). This paper will explore the evolution of this geography over time and discuss whether the factors driving the observed pattern of fertility are the same today as in the nineteenth century, and consider possible reasons for its persistence. The main data sources are full count individual level decennial census data from 1851–1911 (Schürer and Higgs 2014) and summary statistics from the twenty-first century censuses (2001 and 2011) for London boroughs and wards. Our modelling strategy is to estimate OLS and spatial models of the relationship between the level of fertility and a range of contextual variables for each geographical unit.

Email: hj309@cam.ac.uk

Reflecting on the past: Forerunners and spatial diffusion of the fertility decline in England and Wales, 1851-1911 - *Stephanie Thiehoff[1], Andrew Hinde[1], Brienna Perelli-Harris[1], Agnese Vitali[2], [1]University of Southampton, [2]University of Trento*

Examining fertility on the sub-national instead of national level often reveals striking regional differences and strong spatial clustering in fertility patterns. The aim of this paper is to investigate whether spatial diffusion mechanisms contributed to the decline in fertility in England and Wales between 1851 and 1911. Additionally,

we ask if regional sub-cultures, including religion, might have been drivers of the decline. For the analysis, we use historical small-scale geographical data from the Populations Past project as well as from the 1851 Census of Religious Worship. First, we identify leading areas of demographic innovations. To examine spatial diffusion mechanisms, we construct spatially lagged Y models to model Total Marital Fertility Rates between 1851 and 1881 as well as 1881 to 1911. These models are calculated separately for level and change variables. Descriptive maps highlight that not just middle-class and textile areas, as known before, but also North Wales and Cornwall were forerunners of the fertility decline between 1851 and 1881. During this initial phase, the prevalence of affiliation to new dissent religions (only level available) such as Methodists and married women working (level and change) seem to be key drivers of the fertility decline. After the initial drop in fertility (1881 to 1911), the proportion of professional workers (level and change) and married women working (level) together with the increase in schooling (change) are important for understanding the decline. For both periods, the models suggest that spatial diffusion mechanisms contributed significantly to the decrease in fertility in England and Wales

Email: s.thiehoff@soton.ac.uk

Using volunteer-transcribed nineteenth century census records: assessing their merit compared to existing data sets – *Oliver Duke-Williams, University College London*

Research questions: Do data transcribed by volunteers for family history use have potential for repurposing as a historical demography resource? Are there reasons to do so, given that existing versions of this data already exist for analysis? Methods: Descriptive statistics and mapping are used to report general characteristics of a data extract; record linkage will compare results with exact matches, metaphone and Levenshtein distance. Data sources: The paper is based on an extract of c. 2million records from the FreeCEN dataset, representing a complete transcription of census records for Cornwall from 1841 to 1891. FreeCEN (part of FreeUKGenealogy) is a volunteer-transcribed set of records, primarily assembled for family history research. Applications: The FreeCEN data can be used for a variety of purposes, with examples shown of interpretation of census instructions. They are useful in this regard as they are not restricted by significant licence conditions. When used in combination with I-CeM data, the two datasets can be used for cross-comparison to assess transcription quality. A primary application explored is the potential to extract linked longitudinal records by comparison of individual characteristics at multiple time points. Preliminary results: Preliminary results have focussed on uniqueness of individuals and groups of individuals within separate censuses. Surname, first forename and birthplace responses are unique within the data for 64% of individuals in 1851, rising to 76% in 1891.

Email: o.duke-williams@ucl.ac.uk

Historical demography: Mortality. Wednesday 16 September 4.00pm

Differences in mortality of children under five years by sex and gender: The case of El Sagrario, Zacatecas, México between 1835-1845 - *Miriam Angélica Camacho Martínez, Escuela Nacional de Antropología e Historia, Mexico City*

The calculation of infant mortality has been used to measure well-being in a population, the causes of high or low infant mortality will depend on the social, economic, political, time and place in which it is investigated. Research question: the following investigation had as main objective to reveal the differences in the mortality of children under five in relation to sex (in their biological aspect) and gender (as a cultural construct). Method: the statistical techniques of historical demography were used under the approach of demographic anthropology. Data: the source of the data analysed were the departures of deaths (between 1835 to 1845) of the church "El Sagrario", located at the city of Zacatecas, México. Results: the results indicated differences in the causes of mortality by sex, gender and age. In neonatal mortality there was a greater number of deaths due to infectious processes (fevers), there was a male predominance (53%) and diseases related to the

respiratory system. Infant mortality had as main causes of death fevers, respiratory infections and male mortality was slightly higher (52%) than female (48%). Mortality from the second year of life had a predominance of mortality due to gastrointestinal infections, fevers, nutritional deficiencies and epidemic diseases (measles), women recorded higher mortality (53%), especially measles. Potential applications: these results confirm that the impact of cultural and biological factors will have effect in relation to age. Likewise, the cultural value attributed to gender will have a fundamental role towards the care provided to children.

Email: miriamcm2002@gmail.com

A long shadow of mild shocks on health: The intergenerational perspective on the Fetal Origins Hypothesis - *Emre Sari, Mikko Moilanen, and Hilde L. Sommerseth, Arctic University of Norway*

Conditions in early life, and even mild shocks in utero, may affect health later in life. According to the fetal origins hypothesis, adverse maternal environment casts a long shadow in people's life as it increases the likelihood of having adverse health outcomes. As a contribution to the current literature, we hypothesize that the effects of relatively mild economic shocks during pregnancy may have a disadvantageous influence on a child's later life health, such as earlier death, and this adverse impact endures in the next generation. The data of the study reported in this article was obtained from individual-level microdata, which includes three-generation linked individuals born between 1734-1840, in the municipality of Rendalen in Southeast Norway. The empirical research approach adopted for this study is causal mediation analysis within the framework of the linear structural equation model. As a result, we find that the child of a mother who experienced a price increase in the year of her birth lived 0.58 years shorter than those born in years with more favorable conditions. Additionally, the lack of access to nutrition in the year of mother's birth can indirectly affect her child's lifespan for 0.65 years negatively. Thus, the most striking result of the study is that these indirect causality links detected give us the sign that even a mild shock experienced in early childhood can be transmitted through generations.

Email: emre.sari@uit.no

Multi-level modelling using the 1911 'Fertility Census': analysing historical under-five mortality inequalities in London – *Sarah Rafferty, University of Cambridge*

The 1911 census of England and Wales included a series of questions designed to gather information on the 'fertility of marriage', thereby providing a rich data source for analysing married couple's fertility and early-age mortality experiences in the early twentieth century. At this time, although infant and early childhood mortality had begun to decline, the city of London was still suffering from over one in eight children dying before their fifth birthday. London was not homogenous however, instead being a mosaic of diverse communities experiencing health inequalities. The data from the 1911 Fertility Census therefore provides an opportunity for historical demographic analysis of early-age mortality inequalities within one varied urban area. Without age and cause-specific mortality data to investigate this, a Mortality Index has been constructed for over 250,000 married couples living in London at the time of the census. Using the Brass indirect estimation method, the Mortality Index is defined as the ratio of actual deaths to expected deaths for women married less than 15 years and corresponds to the under-five mortality rate. With the Mortality Index as the response variable, the hierarchal structure of the census data has been exploited through multi-level modelling. Data at both a couple-level and registration sub-district-level is analysed simultaneously, therefore studying individual and aggregate effects. Data for these analyses has been drawn from the Integrated Census Microdata project and further official statistical sources. The study aims to untangle the demographic, socio-economic and spatial factors influencing under-five mortality in early twentieth century London.

Email: slr74@cam.ac.uk

The surprising efficacy of early public health interventions: a perspective from evolutionary biology – *Romola Davenport, University of Cambridge*

The COVID-19 pandemic has aroused new interest in the efficacy of traditional preventive public health practices. In the absence of a vaccine or cure modern societies have been forced to resort to long-standing methods of quarantine, isolation, economic shutdowns and social distancing. This paper re-examines the effectiveness of these measures before germ theory. It argues that there was an association between pathogen virulence and early control. In England the most lethal diseases, including plague, typhus, cholera, typhoid, smallpox and malaria, were controlled by the mid-nineteenth century because the characteristics of the pathogens involved meant that disease transmission was relatively tenuous. The chains of transmission could be broken by relatively crude and incomplete interventions, including national quarantine, in the case of plague, and by local and uncoordinated actions in the cases of smallpox and waterborne diseases. These types of intervention were however ineffectual against diseases of greater infectiousness with strictly person-to-person transmission, and chronic infections such as tuberculosis. These latter types of disease were less lethal, and more sensitive to nutritional status. Thus, the early control of the most lethal diseases was associated with large reductions in epidemic mortality, but also shifted the distribution of causes of death towards less virulent diseases of the extremes of age and of poverty. This epidemiological shift strengthened the associations between health and longevity, and between longevity and social status. Put another way, the surprising success of early public health interventions reflects the fact that they were directed at 'low-hanging fruit'.

Email: rjd23@cam.ac.uk