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The 2018 Conference

With the participation of The Netherlands Demographic Society (NVD)

The University of Winchester

10-12 September 2018

Abstracts

Plenary abstracts

Monday 10 September – 3.30pm

Father's role in the development of children's diverging destinies

Professor Renske Keizer (Erasmus University)

In the last decade, the scholarly focus on understanding what childhood conditions matter most for mitigating or widening inequality in child outcomes has changed. Traditionally, scholars have focused on poverty and, somewhat more recently, family structure as key explanations. However, there is increasing awareness that the intergenerational transmission of (dis)advantages is often filtered through intra-familial dynamics, in particular parenting practices. Recent studies that have examined the role that parenting plays in inequality in child outcomes have mainly focused on mothers. The role that fathers play in their children's development, and in specific how inequalities in children's outcomes evolve via fathers' involvement in parenting has often been neglected. Research that sheds light on fathers is, however, urgently needed, because current demographic trends have led to a polarization in fathers' involvement with their children. In this keynote I will provide a brief overview of the literature on fatherhood, and will devote attention to studies on linkages between father involvement and children's developmental outcomes. In addition, I will discuss the (potential) role fathers may play in the intergenerational transmission of social inequality. Finally, I will discuss the importance of national context, showing how laws and policies may influence not only father involvement, but also how they may either strengthen or mitigate the role that fathers play in the development of children's diverging destinies.

Tuesday 11 September – 3.30pm

Linking mortality to the last: Solving the geographical problems

Professor Danny Dorling (University of Oxford)

In 1994, as an overconfident postgraduate researcher, roughly half the age I am now, I gave a talk with this arrogant title at the annual BSPS conference in Durham. I thought it was then possible to explain the UK north/south divide in mortality by looking at lifetime migration patterns. In short, people in the South of England lived longer because those that did not were more likely to migrate to the North before they died, and the South attracted more healthy migrants than the North did. In this talk I want to expand on that idea to consider the importance of migration from and to the European mainland for trends in mortality within the UK. To what extent have mortality rates in the South of England been kept low because of the arrivals of so many young mainland Europeans, mostly in better health than the incumbents, and how has the outflow of more elderly people from the South of England, especially to the European mainland for retirement contributed to the relatively good health of Southern England? The lecture will be illustrated, but is largely speculative, including speculation over what we might expect in future trends in infant and neonatal mortality across Europe and possible effects of the restriction to the movement of midwives and others who help maintain the social reproduction of society. I am hopeful that there might be someone in the audience, possibly now in the mid-twenties, who might think these questions are worth looking into in greater depth and better than I am able to.

Ageing & the life course

Strand organizer: Athina Vlachantoni (University of Southampton)

The role of paid work across the life course & later life – Monday 10 September 1.30pm

Work histories of older adults in China: increasing social heterogeneity across cohorts?
Maodi Xu, Maria Evandrou, Jane Falkingham; University of Southampton

While the labour market behaviour of older adults in China is gaining increasing attention, there remains a dearth of research on work histories within the Chinese context in comparison with western literature. To evaluate the adequacy and future financial sustainability of the public pension system, a holistic understanding of the work histories of current older adults is crucial. This research provides unique evidence on the work experiences of individuals aged 60 and over (born between 1930 and 1954) over the life course, using retrospective life history data from the China Health and Retirement Longitudinal Survey. Results reveal a picture of significant social heterogeneity within work trajectories; there are differences in terms of the dominating economic activities, the intensity of work and the timing of the labour market exit between different living areas and genders. Such differences are largely shaped by the wider economic and institutional context, as well as by key personal characteristics such as educational attainment. Cohort comparisons highlight how different groups of current Chinese elders have been affected by changes in the labour market over the past sixty years, particularly the growth of the non-agricultural sector and the rise of the private sector following the opening up of the economy in the 1990s. These findings emphasise the importance of ensuring policy design that deliver equitable pension entitlements for those Chinese elders residing in rural and urban areas, and between genders.

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For money or for love? Work-family life courses and later-life health
Marco Tosi[1], Emily Grundy[2]; [1]London School of Economics, [2]University of Essex

Most previous studies have focused on family or employment histories singly, while others have analysed work-family life course trajectories using a sequence of employment and marital states. In this paper, we consider a larger amount of information including family and fertility histories as well as indicators of employment and social economic status to analyse how individuals' investments in family and work are associated with later-life health. We examined respondents aged 65-75 at baseline using data from five waves of the UK Household Longitudinal Study. The findings from latent class analysis show that women's life course types can be distinguished by different investments in family and work: on the one hand, the 'short working life' and 'lower class, early family' groups invested more in family than in work; on the other, the 'childless higher SES' group prioritized career over the family. Among men, those who invested less in education and work had also less family involvement ('childless lower SES'), while those in higher socio-economic position invested in both family and work ('higher SES, 2 children'). We ran multilevel models predicting physical and mental health (SF-12). The results indicate that among both men and women weak ties to the labour market and the combination of lower SES and early and large family were associated with more health problems in later life. Findings from growth curve models show that the health disparities associated with work-family life course types persist over time.

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Grandchild care and grandparents' labour supply in Europe
Ginevra Floridi; London School of Economics

Despite the growing research interest on grandparenthood in Europe, not much is known about the relationship between regular grandchild care provision and grandparents' labour supply in mid- to later life. Estimating such relationship is problematic due to the likely presence of unobservable personality traits associated with grandparents' participation in both roles. In this study, I address selection by jointly modelling labour supply and grandchild care provision through a recursive bivariate approach. Using data from the Survey of Health, Ageing and Retirement in Europe, I investigate the relationship between regular provision of grandchild care and two employment outcomes: the probability of being employed and the average weekly working hours. I focus on European grandmothers and grandfathers aged 50–69 with a grandchild younger than 15 and, for the analysis of working hours, I further restrict the sample to those who are in paid employment. The results suggest that, across Europe, the association between regular grandchild care and labour supply differs by grandparental gender and educational attainment. Among grandmothers, grandchild care provision is not linked with the probability of working, but employed grandmothers who look after their grandchildren work on average for less hours. By contrast, among grandfathers, regular grandchild care provision is significantly associated with a lower probability of working, but not with average working hours. Separate analyses by educational attainment reveal that the conflict between grandchild care provision and labour supply only holds for lower-educated grandparents, likely due to the earlier age at grandparenthood among individuals this group.

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A new Census-based measure of socioeconomic position for New Zealanders aged 65 years
Daniel Exeter[1], Olivia Healey[1], Nichola Shackleton[2], Michael Browne[1], Ngaire Kerse[1], Arier Lee[1]; [1]School of Population Health, University of Auckland, [2]Centre of Methods and Policy Application in the Social Sciences (COMPASS), University of Auckland

In 2013, the elderly population accounted for 14% of the total population in New Zealand and, as in many countries around the world, our ageing population is expected to increase significantly over the next 50 years. In many studies of health inequalities among the population at 65 years, researchers typically use individual-level measures of socioeconomic position such as income, occupational class and/or educational attainment, or area-level deprivation indices, which normally centre on the working-age population. However, there is growing consensus that these measures fail to represent the circumstances of older people. In this study, we propose a framework for measuring socioeconomic position among those aged 65 years using 11 census variables representing four constructs of relevance to this population (house value, housing income, tenure, assets and savings). Using the 2013 Census microdata available within Statistics New Zealand's Integrated Data Infrastructure, we provide a demographic snapshot of the study population, before implementing the proposed SEP measure and exploring the association between SEP and a number of health and social outcomes. Preliminary results show a strong association between outcomes such as smoking or area-deprivation. We conclude this presentation with a discussion of the potential uses for this tool in research and planning, in addition to its limitations and future research opportunities.

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The impact of earlier parts of the life course on later life – Monday 10 September 4.45pm

Gender gaps in later-life cognition among older Indian adults: examining the effect of early-life conditions

Prashant Kumar Singh[1], Ridhi Kashyap[2], Lucky Singh[3]; [1]Department of Policy Studies, TERI School of Advanced Studies, New Delhi, [2]Department of Sociology, University of Oxford, [3]National Institute of Medical Statistics, Indian Council of Medical Research, New Delhi

While existing work from the developed world has highlighted how men do worse in cognitive functioning at older ages than women, studies from less developed country contexts indicate the opposite pattern, with women doing worse. In this study, we examine if and how disadvantages accrued in early childhood can help explain gender gaps in cognitive and health outcomes in later life in the Indian context, where a marked son preference has been linked to significant gender gaps in early life conditions. Using data on adults aged 50 and over from the nationally representative WHO-Study of Global AGEing and Adult Health (SAGE) for 2007-08, we examine to what extent parental education, childhood residence and height explain male-female differences in cognitive health in later life. Our results indicate that cognitive function scores are worse among women than men in India. Although women continue to do worse than men, controlling for early childhood circumstances (in particular height followed by parental education) significantly reduces the gender gap in cognitive function among older adults. In contrast, early-life variables such as childhood place of residence do not show a statistically significant association with cognitive function, and do not help in explaining the gender gap.

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Gender differences in the links between childhood circumstances and allostatic load in later life

Thijs van den Broek; London School of Economics

Poor childhood circumstances can be seen as the launch pad for a lifetime of health problems (Raphael, 2011). In addition to having an immediate health impact that remains apparent throughout people's lives, they may initiate a chain of risk, that is, set people off on a life course filled with events and experiences that are detrimental for health. Few scholars have thus far explored the potentially gendered nature of these chains of risk. We use UK Household Longitudinal Study data from ~1,100 women and ~1,000 men aged 60-80 to examine potential gender differences in the links between poor childhood circumstances (low parental socio-economic status; absence of at least one parent) and allostatic load. Allostatic load, i.e. the accumulated physiological 'wear and tear' of the body is measured with an index of 12 biomarkers, 8 of which are blood-based. Preliminary unadjusted analyses show that for both men and women, low as opposed to high parental socio-economic status was associated with substantially higher allostatic load (~25% of a standard deviation). These differences were attenuated after adjusting for parity, marital status and educational attainment, but remained substantial and statistically significant for women. There were large allostatic load differences by educational attainment, but with slight gender differences. Women with low educational attainment had higher allostatic load than women with intermediate or high levels of education, whereas for men only those with high levels of education had lower allostatic load, and there was little difference between men with low and men with intermediate levels of educational attainment.

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Cumulative disadvantage over the life course: does it matter for later life depression?

Georgia Verropoulou, Eleni Serafetinidou, Cleon Tsimbos; University of Piraeus

The main aim of the study is to assess the impact of cumulative disadvantage in three domains of life, health, socioeconomic status (SES) and adverse experiences, on later life depression, decomposing total effects to indirect and direct in order to evaluate possible mediations, while also considering differentials by gender. The sample derives from combining cross-sectional data from the second wave of the Survey of Health, Ageing and Retirement in Europe (SHARE), carried out in 2006-2007, with retrospective information from SHARELIFE (wave 3), carried out in 2008-2009. The sample includes 23,816 persons participating at both waves. The analysis is based on logistic regression models and a decomposition approach. The findings indicate that greater socioeconomic disadvantage, a higher number of adverse

experiences and more health problems are associated with higher chances of depression for both men and women. In spite of the significance of past conditions, in particular for women, concurrent circumstances, especially concerning health, seem to have greater importance. Although all three types of disadvantage have a significant and independent effect on later life depression, there is a synergy and interdependence between them. Indirect effects of SES and adverse events are mediated mainly through health. Health and SES disadvantage have a slightly greater impact among men, whereas adverse experiences are somewhat more important among women. To disentangle these complex associations further analysis is needed based on longitudinal information. Adversity should be measured comprehensively, combining information on stressors from different domains of life.

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Life course transitions in later life in Indonesia: To what extent do life histories and family networks shape these?
Elisabeth Schroeder-Butterfill; Centre for Research on Ageing, University of Southampton

Later life is often characterised by significant transitions in an older person's circumstances. Sometimes transitions may be planned and desired (e.g. ceasing work or moving in with an adult child. At other times transitions can be unexpected and unwanted (e.g. losing a spouse, falling ill or losing the support of a child). This paper asks to what extent later-life transitions are shaped by a person's life history and by their family networks. A person's life history influences the relationships they have formed, the assets and resources they have been able to accumulate and the social status they have gained. It is likely that these in turn influence which transitions are experienced later in life, how they are experienced and how well an older person adjusts to the transition. The paper draws first on longitudinal household survey data from a community in Java, Indonesia, to identify the frequency of key transitions over a 5-year period (e.g. changes in health, work and marital status or living arrangement). It then uses in-depth qualitative data from ethnographic fieldwork in the same community to place observed transitions into the context of older persons' life histories and family networks. This is expected to reveal that accumulated disadvantages over the life course make certain deleterious transitions more likely, but whether these result in lower wellbeing depends on whether supportive family networks exist. The evidence can contribute to arguments for the development of minimum state provision in Indonesia to lessen the impact of deleterious life course transitions in later life.

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Support provision & receipt across the life course – Tuesday 11 September 9.00am

Unmet need for social care among older people in England
Athina Vlachantoni; Centre for Research on Ageing and ESRC Centre for Population Change, University of Southampton

Understanding the nature and extent of unmet need for social care among older people is a critical policy priority in the United Kingdom and beyond, as national governments juggle the provision of adequate social care for a growing older population with competing funding priorities. Several factors can heighten the experience of unmet need among older people, for instance their family environment, and their health and socio-economic status. This paper contributes empirical evidence on the patterns of unmet need for social care among older people in England today, focusing on the individual characteristics associated with experiencing unmet need in relation to mobility tasks, activities of daily living (ADLs) and instrumental activities of daily living (IADLs). The results show that about 55 per cent of older individuals with an ADL difficulty had unmet need, compared to 24 per cent of those with an IADL difficulty and 80 per cent of those with a mobility difficulty. Characteristics reflecting greater vulnerability were more strongly associated with the risk of experiencing unmet need for ADLs, and such vulnerability was greater for particular ADLs (e.g. bathing), and for a higher

number of ADLs. The findings reaffirm the complexity of conceptualising and empirically investigating unmet need in later life, and add to our understanding of the challenges of providing adequate and appropriate social care to older people

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Intergenerational relations: The changing pattern of economic and social transfers within Chinese families
Yazhen Yang, Maria Evandrou, Athina Vlachantoni; University of Southampton

The trends of rapid population ageing, modernisation and urbanisation, changing family structure and weakening filial norms in China are exerting pressure on intergenerational relations within Chinese families. This study investigates the changing intergenerational financial and social support within Chinese families, as well as the impact of changes in co-residence upon the provision of support to or from their parents, based on statistical analyses of the China Health and Retirement Longitudinal Study (CHARLS) data (2011, 2013 and 2015). The preliminary results indicate that the proportion of older people receiving financial support from adult children declined, while the proportion of respondents providing such support to adult children increased between 2011 and 2015. The proportion of respondents receiving assistance with ADL/IADL activities increased from 2011 to 2015, and a higher proportion of this group provided care to grandchildren during this time. The hybrid method combining fixed and random effects models suggests that co-residing with adult children is negatively associated with both the provision of upstream (OR=0.61, p<0.01) and downstream (OR=0.57, p<0.05) financial support, and positively associated with the receipt of social support provided by adult children (OR=2.01, p<0.01). Intergenerational co-residence shows a significant association with the flows of financial and social support within Chinese families over time, and this may reflect a causal relationship. The policy implications of such findings need to be taken into account at the national, regional and local level in order to strengthen the intergenerational ties and to improve older people's well-being in China.

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Care provision to ageing parents and changes in quality of life in Sweden and Denmark. A difference-in-difference study
Thijs van den Broek[1], Emily Grundy[2]; [1]London School of Economics, [2]University of Essex

The impact that providing care to ageing parents has on adult children's lives may depend on the long-term care (LTC) context. When affordable state-supported care services are more widely available, there is less pressure on family members to provide care, which may mean that care-giving has less of an impact on caregivers' wellbeing. LTC coverage has traditionally been generous in Sweden and Denmark, but there has been substantial retrenchment in Sweden in the 1990s and more recently in Denmark. We use longitudinal Survey of Health, Ageing and Retirement in Europe (SHARE) data, collected between 2004 and 2015, to explore differences between the two countries in the impact of care-giving on quality of life. The fact that Danish LTC cutbacks took place considerably later than the cutbacks in Sweden allowed us to conduct difference-in-difference analyses to shed light on possible effects of the availability of state supported LTC services on the impact of care-giving on quality of life. Fixed effects regression analyses showed that care-giving was more detrimental for quality of life in Sweden than in Denmark. However, this country difference did not weaken significantly when LTC coverage was reduced in Denmark. Possibly, the way care-givers are supported shapes the care-giving experience more than LTC coverage.

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Old age without children: How childless women see their future and what do they do to improve it?

Monika Mynarska[1], Sylwia Timoszuk[2];[1] Institute of Psychology, Cardinal Stefan Wyszyński University in Warsaw, [2]Collegium of Socio-Economics, Warsaw School of Economics

In an era of population aging, appropriate care services for seniors are of crucial importance. Poland constitutes a particularly challenging case in this respect. On the one hand, children are the main care providers for elderly parents in Poland. On the other hand, the share of childless individuals has been increasing markedly in recent cohorts. With a poorly developed care system for seniors, childless individuals might become particularly vulnerable in their old age. Do they think and try to do anything about it when they are still in the prime of their life? This is the question that motivated our research. We draw on qualitative interviews with 55 childless women aged 31-42, who declared that it is likely or possible for them to never become mothers, either by choice or due to various circumstances. We address two questions: (1) How do they imagine their old age, and (2) what actions (if any) do they take or plan to take in order to secure a good quality of life as they get older? Both questions are asked in relation to the respondents' childlessness. Our informants recognize they are likely to face numerous difficulties in their old age, mainly related to a deteriorating health and economic hardship. But they take few haphazard actions to prevent that. In-depth, qualitative data allow for investigating the reasons for women's passive or disorganized approach in this respect. We also depict examples of a few good practices that should be promoted and supported.

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Socio-economic status across the life course – Tuesday 11 September 1.30pm

Kenya's Older Persons Cash Transfer Programme: Who benefits in the Nairobi slums?

Gloria Chepngeno-Langat, Nele van der Wielen, Maria Evandrou, Jane Falkingham; University of Southampton

With the number of older people in sub-Saharan Africa growing rapidly, and with the majority entering old age in poverty, many countries have introduced non-contributory pension schemes targeted at the most poor. In resource poor environments, where the majority of people live below the poverty line, identifying those most in need for the limited resources available is challenging. This paper provides the first assessment of the older persons cash transfer programme (OPCTP) in Kenya - a programme which combines a 2-stage selection process involving community-based selection and proxy means tests. The paper investigates whether the 2-stage process ˜correctly'' identifies the targeted vulnerable older people or whether the selection is driven by other factors, such as active participation in the community. Further, it explores whether receipt of the OPCTP results in an improvement in well-being, proxied by the beneficiaries' perception of having enough money to meet basic needs. Data from informal settlements in Nairobi are analysed. Money metric measures and non-monetary indicators were used to evaluate the targeting efficiency and impact of the OPCTP. The study finds no indication of community elite favouring. Using propensity score matching, the paper evidences that the OPCTP helps to raise the living standard of older people.

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Education and employment trajectories of young adults in England and Wales

Alina Pelikh; University of Liverpool

This paper investigates how birth cohort, gender, and socio-economic background influence education and employment trajectories of young adults born between 1974 and 1990 in England and Wales. We investigate how (and whether) the British pattern of the transition to adulthood with an early transition from school to work was affected by societal changes including the expansion of higher education and economic and housing crisis. We apply sequence analysis with specification of dynamic hamming distance measure and partinioning around methods clustering algorithms to combined life histories from the British Household Panel Survey (BHPS) and the Understanding Society study (UKHLS). We compare

sequences of three birth cohorts (1974-79, 1980-84 and 1985-90) up until age 26 and follow the older cohorts until age 30 and 35, respectively. Next, we investigate how various trajectories lead to inequalities in labour market outcomes in later life. Around one third of young adults from each birth cohorts has obtained higher education by age 26 which confirms the prevalence of the rapid school-leaving trajectories among young Britons. The trajectories of the youngest cohort 1985-90 have shown to be the most turbulent. The decrease in 'successful' direct school-to-full-time-work trajectory among the youngest cohort was replaced by the prolonged stay in education (up to 10 years) and increase in part-time employment. The proportion of university graduates from lower socio-economic backgrounds has increased among the youngest cohort yet remaining significantly low. The distinctive for Britain early transitions from school to work are still prevalent, although becoming more complex and precarious in particular among young people from lower socio-economic backgrounds.

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Transition into retirement and changes in health-related behaviours: An investigation on English men and women
Herica La Valle; University of Southampton

This paper deals with the changes in health-related behaviours as associated with the occurrence of life events; specifically, it focuses on the transition into retirement. Since health behaviours are not fixed characteristics of individuals and, as such, they can be modified, understanding the drivers of their changes is the first step of a health promotion strategy. In this paper, it is hypothesised that a key event in an individual's life such as retirement can be an opportunity to change health behaviours. In particular, the following research question is addressed: Are individuals who retire more likely to quit smoking/increase physical activity/reduce alcohol consumption compared with those who do not experience the transition? The analysis is conducted on individuals aged 50 and over and a particular emphasis is put on the investigation of gender differences. Data are drawn from the English Longitudinal Study of Ageing (ELSA), which provides information on individual health, employment, family and fertility histories. By merging all the seven waves of the survey, the changes in work circumstances of respondents can be reconstructed as well as the changes in behaviours between one wave and the next. The analysis is carried out by using multinomial regression and by running three models, i.e. one for smoking, one for physical activity and one for drinking.

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Adult children's education and parental health and mortality in England and Wales. A regression discontinuity approach
Cecilia Potente[1], Patrick Praag[2], Christian Monden[2]; [1]University of Zurich, [2]Nuffield College/University of Oxford

Parents with better-educated children are healthier and live longer, but why is that the case? Previous research on this question has been largely associational and was thus not able to account for all confounders such as genes that would predict both children's education and parental longevity. Our study uses the 1972 educational reform in England and Wales, which increased the minimum school leaving age from 15 to 16 years, to identify the effect of children's education on parental health and longevity in the linked census data from the ONS Longitudinal Study. Our intent-to-treat estimates reveal that children's education hardly affects a wide range of outcomes related to parental mortality and health ratings. Effect sizes are small and rarely reach conventional levels of statistical significance. We interpret these findings against the backdrop of universal and free health care in England and Wales.

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Understanding the characteristics of older persons & cohorts

How do the post-World War baby boom generations compare?
Ngaire Coombs, Angele Storey, Lisa Jones; Office for National Statistics

The post-WW2 baby boom generation turned 70 in 2016. They have lived through a period of unprecedented economic, social, cultural, technological and medical change, and were the first to benefit from the NHS. Babies born earlier, during the baby boom that followed WW1 lived through the Great Depression, were young adults during WW2, and turned 70 in the early 1990s, just as recession hit the UK. Both generations were born in the aftermath of World Wars, but have had very different experiences throughout their lives. How do their situations compare in their 70s? Across multiple indicators, the post-WW2 baby boom cohort fares better in their 70s than the post-WW1 baby boom cohort. They were more likely to survive to age 70 in the first place, and having reached age 70 can expect to live for longer, with a decrease in the gap between male and female life expectancy. This has driven an increase in the proportion married and a decrease in widowhood, although a side effect of this may be the increase in the likelihood of being divorced. They are less likely to smoke in their 70s, and less likely to be childless. They are better educated, are staying in the workplace for longer, consider themselves more financially secure, and are far more likely to be living in homes that are owned outright. The presentation will discuss these differences with reference to the events and influences which have affected these cohorts throughout their lives.

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Brazilian Ninis: A cohort analysis
Anne Caroline Costa Resende, Mariangela Furlan Antigo, Carolina Guinesi Mattos Borges; Universidade Federal de Minas Gerais

Despite the strong economic growth seen in Brazil in the 2000s, with a significant increase in the formal labour market and in real income, along with reductions of inequality and poverty levels, the proportion of the Ninis just marginally fell in the last two decades. Despite these gains, the widespread presence of youths between 15 and 24 years old that are not in school, nor in the labour market, remained a persistent and, apparently, structural phenomenon. Based on this scenario, this work acknowledges the model developed by Behrman et al. (2014), in which the time allocation of youths is influenced by individual, familiar and local factors, and, furthermore, by macroeconomics factors. Empirically, in order to determine the Ninis' condition for youths between 15 and 24 years old, data from the Continuous National Household Sample Survey (PNAD), from the Brazilian Institute of Geography and Statistics (IBGE) between 1992 and 2015 was analysed. The usage of a pseudo-panel method allows the observation of the evolution of cohorts over time, tracing their life cycle. The estimations display that local causes, such as being in high school, higher than average schooling and higher males' occupational rates reduce the proportion of the Brazilian Ninis, as well as the fertility rate. In addition, a favorable macroeconomic environment contributes to a smaller proportion of youths that are neither in work, nor in school.

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Exploring the incidence of falls among the older Kuwaiti population
Hadeel Alsaleh, Saseendran Pallikadavath, Julie Udell, Amy Drahota, Mark Amos; University of Portsmouth

Globally, much attention has been paid to the characteristics of falls within older populations. However, it is important to consider regional contexts of falls. This study provides evidence of the incidence of falls in Kuwait, which is currently unknown. We conducted a population based retrospective cross-sectional study in Alrazi Orthopaedic Hospital-the only orthopaedic hospital in the country. Older adults' fall profiles were compiled via an audit across three months of Accident & Emergency (A&E) admissions records from May to July 2016. We recorded the total number of older patients (50 and above) who reported a fall, as well as patients' age, gender, nationality, and diagnosis. The results of the study show an incidence of falls of 4.20 per 1000 and 2.28 per 1000 for serious falls. The incidence of both falls and serious falls increases with age on the probability of having a serious fall of the older age group (OR= 1.89, P= 0.004) compared to younger age

group. We modelled scenarios for the effect of differential rates of A&E attendance on estimated incidence to account for differential non-response. The rate of both fall and serious fall among Kuwaitis is considerably higher than among non-Kuwaitis; falls among non-Kuwaitis are likely to be underreported, our analysis reveals that this under-enumeration would need to be in the region of 70% to explain the differential rates. Exploring the risk factors, understanding, and attitudes towards falls prevention in Kuwaiti residents is an important next step to address this health issue.

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BREXIT: Before and after

Session organizer: Athina Vlachantoni (University of Southampton)

Tuesday 11 September 11.00am

Love in a time of Brexit': Bi-national families and the UK's EU Referendum
Jane Falkingham, Maria Evandrou, Athina Vlachantoni and Zhixin Frank Feng; ESRC Centre for Population Change, University of Southampton

Partnerships between individuals of different ethnicity or nationality have been increasing as a result of intra-European migration, as well as migration into Europe by individuals born elsewhere. Bi-national partnerships have frequently been used as an indicator of social integration, particularly in the case of partnerships which result in bi-national children. Against the background of the impending Brexit, this paper explores the prevalence and characteristics of bi-national partnerships in the UK using data from the UK Census 10% sample and the Understanding Society dataset. In addition, the paper explores the association between the type of partnership and the preferences of respondents on whether the UK should remain in, or leave the European Union. The results show that around 3 percent of all partnered individuals aged 18 and over in the UK were in partnerships were one partner was UK-born, and the other was born in another EU country; this equates to around 2 million people. Individuals in bi-national partnerships were more likely to support the UK remaining in the EU. Those in UK-EU partnerships which also included children, were even more likely to support the UK remaining in the EU. However, approximately one-quarter of persons in UK-EU partnerships supported the UK leaving the EU, highlighting the complex influence of having a non-UK-born partner on one's views on Brexit.

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Examining homogeneity in EU and non-EU migrants in pre-Brexit UK
Nahid Kamal, Gabriela Mejia-Pailles; PopDev Consultancy

Although there has been much focus on consequences of Brexit on EU migrants, little is known about its implications on migrants from the rest of the world. This analysis compares the demographic and socio-economic characteristics of two groups of migrants: those from EU countries and from the rest of the world. These two groups are examined by when they arrived in the UK; either recent migrants having arrived during the five years preceding the census or older migrants having arrived 5+ years preceding the census thus qualifying for naturalization. Their age, education, activity status and health needs were examined. The micro-data file of the 5% sample of the 2011 Census of England and Wales was used for this analysis. Preliminary results suggest that the proportion of the population aged 19-64 years was higher among migrants from non-EU countries. However, relatively more EU migrants of this age group were in employment. That said, recent migrants in both groups were less likely to be employed.   For both recent and longer-term migrants, those from non-EU countries showed higher levels of education than their EU counterparts. This research highlights the important considerations that need to be taken into account in the social policies following Brexit. Any vacuum created in the labour force by Brexit may prove challenging to fill given the differences in the skills and backgrounds of EU and non-EU migrants. The EU and non-EU groups could complement one another, for example higher educated non-EU migrants potentially contributing towards supporting the healthcare needs of the proportionately larger elderly EU migrants.

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Brexit and EU student migration: Evidence from a natural experiment.

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This paper represents the first attempt to study the causal impact of Brexit, namely the UK's departure from the European Union (EU), on the post-graduation mobility decisions of EU students. We exploit the British government's formal withdrawal notification under Article 50 as a natural experiment and employ a difference-in-differences design. Using data from a new survey of graduating international students, we find that EU graduates are significantly more likely than non-EU graduates to plan on leaving the UK upon graduation immediately after the announcement. Interestingly, results are especially driven by all students from the new EU countries and students from the EU15 countries who are uncertain of their migration plans. We further show that the deterrent effects are stronger for students who are females, elder, study non-STEM subjects, have low grade expectations, receive student funding for their studies, and study at Russell Group universities. These findings carry important implications for the post-Brexit UK in transition and for European countries with emerging calls for their own referendums.

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Renationalised belonging? The effect of Brexit on EU immigrants' attitudes to British citizenship

Chris Moreh[1], Derek McGhee[2], Athina Vlachantoni[3]; [1]York St John University, [2]Keele University, [3]University of Southampton

Intra-EU migrants have traditionally faced few pressures or incentives to formalise their 'permanent' residence or to naturalise in their EU host countries. Focusing on the UK, the paper examines changes in practices and attitudes to such 'legal integration' in the context of Brexit. Combining an analysis of the latest available secondary administrative data on naturalisation trends and primary data originating from an online survey (N=1517) undertaken in the months before the EU Referendum, the paper assesses whether Brexit is the sole motivating factor behind a renewed interest in British citizenship, or whether other factors also play a significant role. The results presented in the paper reveal both continuity with pre-Brexit processes and the strong but differential effect of Brexit. Results from regression models in particular show that factors related to more intrinsic attitudes, such as the migrants' initial reasons for migration, interest in legal integration options leading to a higher awareness of such options, and potentially Euroscepticism are also important factors driving a preference for naturalisation. Through this analysis the paper makes a significant contribution to understanding the complexities of legal integration processes in times of radical structural change, allowing for initial conclusions to be drawn regarding the possible political demographic consequences of Brexit.

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Data quality

Session organizer: Phil Humby (Office for National Statistics)

Wednesday 12 September 9.00am

How to compensate for missing data in bio-marker data sets: A simulation study based on the English Longitudinal Study of Aging (ELSA)
Tina Hannemann, Natalie Shlomo; University of Manchester

In recent years more and more large-scale social surveys include bio-marker information gained from blood, hair or saliva samples. The analysis of such data among large samples has enhanced socio-medical research in many aspects e.g. the analysis of C-reactive proteins in blood samples as early indicators of chronic inflammation, the underlying cause for many cardio-vascular diseases. Due to attrition, lack of consensus or technical issues in the taking and analysis of the bio-marker sample the number of valid bio-marker samples is often largely reduced in comparison to the original survey sample, which can cause serious bias if ignored in the analysis. This paper tests various methods to overcome missing data bias, using the complete bio-marker sample from the second wave of ELSA. Thereby, three scenarios ((1) missing completely at random (MCAR), (2) missing at random (MAR) and (3) missing not at random (MNAR)) and five methods ((1) complete case, (2) Inverse propensity weights, (3) Mills' Ratio, (4) multiple imputation and (5) multiple imputation + Mills' Ratio) are taken into account. Each combination of scenario and method is simulated 20 times and the average compared against the "true" data. Results show different success levels to compensate for missing data, depending on the pattern of missingness and the five methods. While some methods achieve results close to those of the "true" data others introduce substantial bias (coefficient magnitude and significance). With the rise of the popularity of bio-marker studies, the impact of non-random missing data should be carefully addressed in future socio-medical research.

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Depends who's asking: interviewer effect on abortion data in Malawi DHS
Tiziana Leone, Laura Sochas, Ernestina Coast; London School of Economics

In Malawi, abortion is legally only permitted to save a woman's life. The morbidity and mortality burden of unsafe abortion remains high. The 2015 Malawi Demographic and Health Survey (DHS) included induced abortion-specific questions; previous DHS evidence on abortion has often been discarded due to low quality and insufficient data. The aim of this study is to assess the validity of the abortion-specific question and to test the impact of the interviewer on the level and quality of response and whether there is an impact at household level. We used a logistic regression of the outcome: reporting ever having an abortion, with cross-classified random intercepts at the level of the sampling cluster and the level of the interviewer. This allows us to consider simultaneously the amount of variance in the outcome associated with different interviewers, and the variance associated with different communities, while controlling for relevant demographic characteristics. Cross-classified random effects are used because interviewers and clusters are not nested within one another. Results show a clear interviewer effect. The variance of the interviewer effects was very large: 1.37, much larger than the variance for the sampling clusters, 0.28. Interviewer controlling for women's demographic characteristics, accounted for nearly 28% of the variance in the odds of reporting an abortion. In contrast, the sampling cluster where women were interviewed (their community), accounted for only 5% of the variance. This study calls for a wider awareness of the impact of interviewers on the data outcomes, in particular when questions are sensitive.

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Trends in DHS data quality in Sub-Saharan Africa: An analysis of age heaping over time in 34 countries between 1987 and 2015

Mark Amos, Tara Stones; Portsmouth Brawijaya Centre for Global Health, Population and Policy; University of Portsmouth

This paper evaluates one aspect of data quality within DHS surveys, the accuracy of age reporting as measured by age heaping. Other literature has explored this phenomenon, and this analysis builds on previous work, expanding the analysis of the extent of age heaping across multiple countries, and across time. This paper addresses this by making a comparison of the magnitude of Whipple's index of age heaping across all Demographic and Health Surveys from 1986-2015 in Sub-Saharan Africa. We use a random slope multilevel model to evaluate the trend in the proportion of respondents within each survey rounding their age to the nearest age with terminal digit 0 or 5. We find that broadly speaking the trend in the proportion of misreported ages has remained flat, in the region of 5% of respondents misreporting their age. We find that Nigeria and Ghana have demonstrated considerable improvements in age reporting quality, but that a number of countries have considerable increases in the proportion of age misreported, most notably Mali and Ethiopia with demonstrate increases in excess of 10% points.

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Update and data quality in UK Mixed-device online surveys

Olga Maslovskaya, Gabi Durrant, Peter WF Smith: University of Southampton

We live in a digital age with high level of use of technologies. Surveys have started adopting technologies including mobile devices for data collection. There is a move towards online data collection in the UK, including the plan to collect 75% of household responses through the online mode of data collection in the UK 2021 Census. However, evidence is needed to demonstrate that the online data collection strategy will work in the UK. No research has been conducted so far in the UK to address response quality among general population in mixed-device online surveys. This analysis uses the Understanding Society Innovation Panel Wave 9 and two sets of experiment data from the ONS Online Household Study. Descriptive analysis and appropriate multilevel regressions are used to study data quality indicators such as break-off rates, item nonresponse, response style indicators, and response latencies in online survey in the UK. Results suggest that we can be less concerned about respondents using smartphones for future surveys, even for longer ones as breakoff rate is relatively low and data quality is not very different. The findings from this analysis will be instrumental to better understand data quality issues associated with mixed-device online surveys and in informing best practice for the next UK Census 2021. The results can help improving the design of the surveys and response rates as well as reducing survey costs and efforts.

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Demography, inequality & social policy

Strand organizer: Wendy Sigle (London School of Economics)

Fertility & economic inequality in Europe – Monday 10 September 4.45pm

The impact of fatherhood on wage inequality among British, Finnish, and German men.
Rossella Icardi, Lynn Prince Cooke, Anna Erika Hagglund; University of Bath

Having children predicts gender wage inequalities. Fatherhood is associated with greater wages that contrast with motherhood wage penalties, but not all fathers benefit equally. In this paper we theorize how the effect of fatherhood across the wage distribution might vary with the constellation of family, state, and market institutions that constitute 'fatherhood regimes'. Britain and Germany are modified male breadwinner states, although the German labour market enabled more men to support dependent wives and children. Finland is a solidaristic regime, with institutional supports for both dual-earning and greater wage equality among men. Using 2000 to 2014 waves of British, Finnish, and German national panel data and unconditional quantile regression, we compare the fatherhood premium across the wage distribution in each country. We also compare how much of the gross fatherhood wage premium at each quantile is accounted for by observed and stable unobserved characteristics. In all three countries, both gross and net premiums are greater at the 80th than 20th quantile of the wage distribution. At the 20th quantile, observed characteristics account for more of the British fatherhood premium than in the other two countries. In all three countries, however, observed and time-invariant unobserved characteristics account for most of the premium at both the 20th and 50th quantiles. Net of characteristics, there is an unexplained premium only at the top of the distribution that is largest in Germany and somewhat smaller in Finland. We conclude that parenthood sustains only elite men's advantage, to varying degrees across regimes.

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Making ends meet with children: A panel analysis based on EU-SILC data for 30 European countries
Sonja Spitzer[1], Angela Greulich[2], Bernhard Hammer[1]; [1]Wittgenstein Centre for Demography and Global Human Capital, [2]University Paris 1 Sorbonne-Pantheon

The arrival of a child changes household income as well as needs, which consequently alters self-reported income adequacy. We analyse the effect of births on subjective economic wellbeing, hereby capturing the direct and indirect costs of young children. The analysis is based on EU-SILC longitudinal data for 30 European countries from 2004 to 2015, enabling comparisons within and between countries as well as different types of welfare regimes. Our results show that children decrease subjective economic wellbeing in all regions, the first child being the costliest. Indirect costs in the form of income losses vary considerably across country groups, but are offset by public transfers. In the short term, direct costs of children explain most of the drop in self-reported income adequacy.

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Female unemployment and child poverty among immigrants in Denmark, 1980-2017
Anna Tegunimataka, Centre for Economic Demography, Lund University Sweden

The challenges of immigrant poverty are many. Unemployment and difficulties in escaping economic hardship have long-term negative consequences for individuals and families and influence the well-being of future generations. This paper has two main aims. First, it studies long-term changes in immigrant family poverty in Denmark, with a particular focus on the developments from 2001 onwards that came with a number of policies directly aimed at immigrant families. Second, it studies the link between female labour force participation and the escape from poverty for immigrant children and families, taking country of origin differences in labour force participation of females into consideration, using bivariate probit models and decomposition techniques with register data of the full Danish population. Denmark is chosen as the

setting for this study as it is a country with low general levels of poverty and an extensive social security system. Yet, poverty levels among immigrants are the highest in Scandinavia and seem to be persisting over time. The period of study (1980-2017) is interesting since it is characterized by large (by Danish standards) inflows of immigrants that coincided with major reforms directed towards immigrant families. Initial results show increasing poverty levels for especially non-western immigrants since the early 2000s and that the difference in poverty levels between ethnic groups can be attributed to differences in female labour force participation.

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Every country wants to be Sweden. Divergent fertility outcomes despite EU convergence of family policy instruments
Wendy Sigle & Joanna Marczak, London School of Economics

The persistence of total fertility rate (TFR) at below-replacement level of 2.1 has led to considerable concerns in many European countries about the potentially harmful economic effects of population ageing. There is an agreement in Europe that meeting the demographic challenges requires policies that support higher fertility and high female labour force participation. The EU played an important role in these developments by setting family policy goals, often based on best practice examples from higher fertility EU countries (usually Scandinavia or France), that other member states are encouraged to follow. Despite EU-endorsed converging family policy instruments across member states, TFR persists at very low levels in Central and Eastern as well as Southern Europe. This prompts questions about whether, or in what circumstances family policy instruments implemented in some of the higher fertility European countries, and encouraged by the EU, can indeed provide a 'blueprint for reform' for other, low-fertility European nations. In this paper we discuss how the impact of family policies depend on the interaction between a 'family package' and the (previous) national public policy logic as well as institutional setting such as the labour or housing market. Overall, we conclude that if governments in some of the very low-fertility nations follow the EU recommendations of introducing policy measures which appeared to maintain high fertility in some of the higher fertility member states, while discounting country-specific institutional setting and wider public policy logic, this may have very limited, or even detrimental, impact on fertility levels.

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Variations in wellbeing within countries – Tuesday 11 September 11.00am

How underwork in Europe affects wellbeing: gender and age effects
Shireen Kanji, University of Birmingham

Underwork, when workers' hours of work are below their desired hours, has received renewed attention in Europe since the Great Recession. The adverse effect of underwork in terms of wellbeing, including depression, has particularly impacted younger workers, for example in the UK (Bell and Blanchflower, 2011). The adverse effects of underwork on wellbeing have been established for the UK by Heyes et al (2017) and for Germany by Wunder and Heineck (2013). Findings from these previous studies are unexpected in that women have been found to be more adversely affected by underwork than men. This article explores further the gender and age differences in the impact of underwork on wellbeing using data from the European Social Survey's rotating module on work and family from 2010. We analyse life satisfaction as a measure of wellbeing, examining its associations with the mismatch in working hours (overwork, matched hours, underwork). In line with other studies we find that underwork is associated with diminished wellbeing for men and a stronger negative effect for women. The u-shaped effect of age on wellbeing, which has been widely found in studies, interacts with underwork so that at all ages workers who report they experience underwork also report lower levels of wellbeing. Having a partner raises wellbeing of itself but it does not compensate for underwork. However, the subjective evaluation of household income is closely related to underwork in its effect on wellbeing, demonstrating how underwork is tied to social inequality.

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Birth cohort size and wellbeing of United Kingdom citizens
Yiwan Ye, Xiaoling Shu, University of California, Davis, Department of Sociology

We investigate the relationship between patterns of population growth and subjective wellbeing of different birth cohorts. Using eight waves of United Kingdom national data from European Social Survey from 2002 to 2016 (N = 17,153), we examine the association between birth cohort size and well-being (sense of happiness, income class, education attainment, and employment) of United Kingdom citizens who were born from 1914 to 2000. Using Age-Period-Cohort (APC) multilevel model, we found happiness varied significantly across birth cohorts. Preliminary results suggest individuals from low birth cohorts tend to have a higher sense of happiness than individuals from high birth cohorts net of individual age effect, period effect, socioeconomic status, health condition, and other demographic controls. Although income class, education, and employment status differ significantly across birth cohorts, birth cohort size does not seem to have an impact on these wellbeing indicators. Birth cohort size and income class interactions show that individuals from higher income classes suffer less from the negative effects of large cohort size, while neither gender nor minority status mitigates this cohort effect. We discuss methodological limitations and policy implications.

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Age at arrival and the integration trajectories of childhood refugees
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A sizeable literature has shown that in most high-income countries, immigrants who arrive in early childhood experience a series of socio-economic advantages over those who arrive during late childhood or adolescence. However, studies have yet to examine whether this is also true for refugees, and how the effect of age at arrival varies over their early adult life course. This is a timely question, particularly in Sweden, and many other European countries, where there has been a significant growth in asylum seeker inflows during recent years and governments are struggling with the question how best to integrate refugees and their children. Using Swedish register data, we examine the impact of age at arrival on refugee integration, by focusing on a comparison of siblings who arrive as children at different ages. The results show that arrival after early childhood constrains the acquisition of human capital, decreases the probability of obtaining citizenship, and reduces earnings prospects over time. Our findings highlight the particular integration challenges that older childhood refugees are facing and suggest the need for targeted policies to support this particularly vulnerable group

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Inequalities among the subcastes of scheduled castes in Maharashtra, India in the context of higher education and employment
Vini Sivanandan, Vinod Sivanandan; Gokhale Institute of Politics and Economics

The present study is a preliminary analysis and gives a summary of findings with regard to the characteristics of employment among the highly educated population of scheduled castes (SCs) of Maharashtra. Although, with affirmative action the representation in employment has increased, the question arises as to whether this has reached across all the subcastes of SCs equally. The objective of this study is to understand the pattern of employment among the subcastes of the SC population in Maharashtra who are graduates and above and absorbed into the workforce. Data for the study is from Census 2011, India and theil index is used to examine the differential in representation as a primary worker in different sectors of employment. Overall result indicates that on the one hand, there is least inequality between subcastes in terms of representation in various sectors of employment, whereas at the other end the representation of SCs by sectors of employment are linked to their traditional occupation. The study also indicates that the mere provision of affirmative action without consideration of background of communities may not yield the desired outcome

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Evaluating policy interventions – Tuesday 11 September 4.45pm

The effectiveness of current labour market integration and job counselling trajectories for newly arrived immigrants and individuals with a migration background in Belgium
Jonas Wood, Karel Neels ; University of Antwerp

Between 2015 and 2030 welfare states throughout Europe will face the long-term implications of the babybust. The UN and OECD have estimated that a significant increase in migration is required to maintain the size of the working age population in Europe. However, migrants typically have employment rates that are significantly lower than natives, fuelling scepticism in the public debate with respect to replacement migration. Unfortunately only a limited body of research has assessed the uptake and impact of general and migrant-specific active labour market programmes and integration policies on labour market outcomes of first and later generation migrants. This study links longitudinal register data from integration, employment and social security offices to analyse the uptake of labour market and integration policies and labour market trajectories of the resident migrant population (first and second generations) and new migrants settling in Belgium in 2005-2016 (first generation, including asylum seekers). Results for the resident migrant population indicate that first and (most) second generation migrant groups are more likely to witness job counselling measures of control and sanction (obligatory job interviews, benefit reduction), that first generation migrants are less likely to witness stimulating job counselling (job announcements), and that both groups are less likely to take up courses or training on the job compared to groups without a migration background. The results for new migrants indicate that groups which are obliged to follow (at least one module) of language training or integration courses exhibit considerably higher language proficiency and integration certificates*.*

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Socio-economic differentials in the uptake of (in)formal childcare in Belgium and their effect on subsequent family formation
Naomi Biegel, University of Antwerp

The positive association between fertility and female employment in OECD countries suggests that family policies have played an important role in reducing the 'parent-worker' conflict. The empirical literature, however, finds only small positive effects of family policies on fertility, but has typically failed to consider eligibility and uptake of family policies at the individual level, as well as population heterogeneity in the uptake and effect of these policies. Using longitudinal individual-level data from the 2001 Census and the National Register, we document socio-economic and educational differentials in the uptake of formal childcare (kindergarten, day care centre, family day care) and informal childcare arrangements (family or household members) in Belgium in 2001 and analyse the effect on subsequent parity progression in the period 2002-2005. This linkage allows us to model uptake of (in)formal childcare arrangements in 2001, controlling for individual and household-level characteristics, as well as proximity and characteristics of grandparents. Additionally we include contextual data on availability and characteristics of formal childcare arrangements at the municipality level. Preliminary results indicate a strong positive educational gradient in uptake of formal care. The uptake of informal childcare is higher among mothers with a degree in secondary education, and lower among higher educated mothers, compared to mothers with no or only primary education. Controlling for local childcare availability, employment opportunities, and working and health status of the grandmother weakens the educational gradient. There is a positive effect of uptake of (in)formal childcare on 2nd birth hazards in the period of 2001-2005.

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Social cash transfers, generational relations and youth poverty trajectories in rural Lesotho

Thandie Hlabana[1], Nicola Ansell[2], Lorraine van Blerk[3], Elsbeth Robson[4], Flora Hadju[5], Evance Mwathunga[6]and Roeland Hemsteed[3]; [1]National University of Lesotho, [2]Brunel University, [3]University of Dundee, [4]University of Hull, [5]Swedish University of Agricultural Sciences, [6]University of Malawi

Social cash transfers (SCTs) schemes have been introduced in many African countries as a means of addressing poverty and inequality. Some of these schemes target individuals or households on the basis of their extreme poverty; others target groups that are deemed vulnerable due to aging (and unable to work) or young (and need investment in their futures). Although, there is strong evidence that SCTs address symptoms of poverty in target populations, these evaluations have focused on targeted beneficiaries. Understanding poverty through a relational lens, we investigate the indirect impacts of cash transfers on young people's poverty trajectories. We argue that developmental interventions are likely to have wider impacts beyond the targeted beneficiaries. Using a rural village in Lesotho as a case study, we draw on in-depth interviews with young adults, and with people of diverse ages in grant-recipient households, along with a series of participatory group activities with young people, we explore how these social cash transfer schemes are reshaping relationships between generations within and between households in rural communities.

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Developments in official population statistics

Strand organizers: Jim Newman, James Robards (Office for National Statistics)

Monday 10 September 4.45pm

Administrative Data Population Estimates for Northern Ireland
Kathryn Ewan, Northern Ireland Statistics & Research Agency (NISRA)

This presentation will describe how NISRA have used administrative data to estimate the size of the usually resident population through the creation of a prototype statistical database of all usual residents. The statistical database is used to create Administrative Data Population Estimates (ADPE). The ADPE will be used to quality assure the official Mid-year population estimates and the statistical database of usual residents will be used to supplement the 2021 Census enumeration. How the statistical database of usual residents will be used to supplement the 2021 census enumeration will also be described.

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How integrated data can be used for public good
Justine McNally, Admin Data Census, Office for National Statistics (ONS)

ONS has been using integrated data to research into the Government ambition that "censuses after 2021 will be based on alternative sources of data." The Administrative Data Census project has made progress in: producing a range of Research Outputs that are typically produced by the ten-yearly census; comparing these outputs with official statistics; and seeking feedback from users. Research so far has covered the size of the population, household statistics (including the size and structure of households), and a range of population characteristics including income, labour market status, commuting flow patterns, ethnicity and most recently, nationality. These outputs have used a range of integrating methods and data sources including administrative data, commercial (aggregate mobile phone data) and survey data. We are now expanding our research to look beyond what is traditionally produced by the census to understand how integrated data can be used to provide new insights into society. Using integrated data brings a range of new challenges in the production of statistics to meet user needs such as: understanding the data quality and definition differences; developing new methods to measure and adjust for coverage errors; and producing multivariate small area outputs when variables come from different data sources with different coverage errors. A key part of making the best use of the vast range of data available is to demonstrate the public good of using these data. This involves explaining: • Why the statistics are important to shaping public policy • The benefits these statistics bring to the public • How we are protecting the data we are using. This presentation will explore the new types of analysis that are possible from integrated data, the social benefits of producing these outputs and our plans to promote understanding of these benefits.

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Developing international migration statistics from health data to inform the policy debate
Ali Dent and Chloe Pearce, Integrated Data Division, ONS

Background: International migration flows into and out of the country are currently estimated using the International Passenger Survey (IPS). Whilst significant improvements have been made to the IPS in recent years, the landscape and demands for information have shifted and continue to shift. This is one of two presentations showing examples of the work ONS is currently undertaking to make better use of new and existing data sources to better understand international migrations flows to the UK and the impact these migrants have on the economy and society. Objective: ONS are considering the feasibility of using existing data sources to measure the long-term flows of international migrants into and out of the UK. Health data provides information on people who register with a GP with a previous address overseas. New health data also provides information on an individual's changes in status. By making best use of these data sources, we

can better understand the journeys of migrants. Methods and Results: By identifying non-UK nationals and studying their interactions with the health system over time, including any changes in status, we have been able to assess when they arrived and if they have been in the UK for 12 months or more (which is in accordance with the UN Definition of a long-term migrant). We have compared our 'potential long-term immigrants' with our official LTIM series. Our results show that using health data alone, whilst useful in measuring the activity of some migrants, does not provide the full picture of long term migrants coming to live in the UK. Conclusion: Health data alone does not provide the full picture of long term migrants coming to live in the UK. However, it may be possible to over-come some of the limitations in the future by linking health data to other administrative data sources to improve coverage and address measurement errors. Contribution: By making use of the powers available under the Digital Economy Act (2017), ONS have an ambitious programme of work to develop and improve international migration statistics that puts administrative data at the core of migration statistics by 2019. In addition, linkage of administrative data sources from across government will provide greater insight into migrants' journeys and lives and provide a richer set of statistics to inform policy decisions and public debate.

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Improving and developing international migration statistics to inform public and policy debate: Using Admin Data to estimate the impact of non-EU migrants on the UK economy
Joe Gisby and Hannah Teare, MIgration Statistics Division, ONS

Background: International migration flows into and out of the country are currently estimated using the International Passenger Survey (IPS). Whilst significant improvements have been made to the IPS in recent years, the landscape and demands for information have shifted and continue to shift. This session provides two examples of the work ONS is currently undertaking to make better use of new and existing data sources to better understand international migration flows to the UK and the impact these migrants have on the economy and society. Objective: To provide analysis on how Admin Data can be used to measure the impact of non-EU nationals on the UK economy. Methods and Results: Non-EU nationals can be identified within linked administrative data sources in two ways: • Unique identifiers - such as National Insurance Numbers allocated to non-UK nationals working or claiming benefits in the UK • Match key identifiers – using demographic variables such as name and date of birth. Identifying non-EU nationals within linked admin data source such as HMRC tax and DWP benefit data enables us to better understand how they are interacting with the UK economy, and assess what impact they are having in comparison to UK and EU nationals. Conclusion: Analysis of a feasibility extract of linked administrative data has found that benefits data can provide a greater insight into how international migrants interact with the UK benefits system, as well as provide signs of activity for non-EU nationals residing in the UK. Contribution: By making use of the powers available under the Digital Economy Act (2017), ONS has an ambitious programme of work to develop and improve international migration statistics that puts administrative data at the core of migration statistics by 2019. In addition, linkage of administrative data sources from across government will provide greater insight into migrants' journeys and lives and provide a richer set of statistics to inform policy decisions and public debate.

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9.00am Wednesday 12 September

Do we know our data as well as we think we do?
P. Humby, S. Reeves, J. Buxton; ONS

To help answer this question, in 2016/17 ONS' Population Statistics Division produced a series of quality reports on the administrative data sources that contribute to their outputs. This presentation will set out what we were looking to achieve and how we went about it. It will touch on areas where we know our data well and acknowledge where we do not know our data sources as well as we should. Inevitably, this means there are areas we have discovered where we need to improve (and these are not just about understanding the data). The benefits of this work both to ourselves and to those

who use our statistics, as we perceive them, will be outlined. As we are in the process of producing an updated series of reports, including new sources to reflect our changing use of data, the improvements that we have made (based on feedback received) will be outlined. We are enthusiastic about what you think of what we have done: what we have done well, what we could improve, what we have missed, what you use them for. While we are happy to get this feedback at any time, this is a great opportunity to do so face-to-face!

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A shared data set: Aspiring to successful outcomes for vulnerable children in Scotland through strategic needs assessment and performance measures - Implications for official statistics
Cecilia Macintyre, Scottish Government

As part of the Child Protection Improvement Programme, the Scottish Government has committed to working with local areas to improve data and evidence to support continuous improvement. This is in recognition of the importance of having good baseline data to identify and test out areas for improvement as well as planning and performance. A shared dataset focusing on vulnerable children and young people is being developed to help partners who are responsible for, and have a remit for child protection and corporate parenting to gather data and evidence that can be analysed and used to plan and deliver services and enable them to demonstrate performance. The presentation will describe the process of identifying the components of the shared dataset, and summarise the findings from the consultation across a wide range of partners involved in child protection. It will identify the implications this has for the current national and official statistics published by Scottish Government, and present findings of analysis of data collected on looked after children, and the child protection process to meet the needs of users of the shared dataset.

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Revisions and the chain of official data: how revised population estimates and updated methods feed into subnational population projections and other official demographic estimates
Neil Park[1], Tim Pateman[1], Andrew Nash[2], Olga Krikun[2]; [1]Population Estimates Unit, ONS, [2]Population Projections Unit, ONS

ONS has a commitment to continuously seek to improve its population statistics, without undermining usefulness to users by making constant changes. The most substantial set of changes that is planned for implementation between the 2011 and 2021 Censuses is being released across 2018. Firstly, a revised back-series of mid-year population estimates for mid-2012 to mid-2016 was published on 22 March 2018. The revisions incorporate the latest admin data available for distributing international immigration estimates to the local authority level, and a new model to distribute international emigration. While changes for most local authorities are relatively small, many local authorities with large proportions of students are revised downwards. The subnational population projections (SNPPs), published on 24 May 2018, use the revised mid-2016 estimates as their base and also use the revised component data. This part of the presentation focuses on the driving forces behind the 2016-based figures stemming from revisions in mid-year estimates, assumptions made in national projections and the SNPP-specific changes in methods. It will also touch on challenges around the interpretability and uses of projections. The SNPPs in turn will feed into the 2016 based Household Projections, to be released in September 2018. Revised small area population estimates and reweighted Labour Force Survey estimates will also follow later in 2018.

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Time-to-death and National Statistics in Scotland
Maria Kaye, National Records of Scotland (NRS)

A person's age is usually measured as chronological age, the number of years since birth, but it can also be measured as thanatological age, the number of years until death. Unlike chronological age, thanatological age is affected by life expectancy. For example, in Scotland, a man aged 65 in 1981 could expect to live 12 more years. A man aged 65 in 2016 however, could expect to live a further 17.5 years; in thanatological terms, he is 'younger' than the man in 1981. This is significant, because literature shows that wellbeing in old age correlates more strongly with years remaining than years lived. Therefore, as life expectancy increases, we would also expect an increase in the number of years a person would be in good health and able to actively participate in society. Life expectancy in Scotland has increased since the 1980s but in recent years, the rate of increase has been stalling. Scotland currently has the lowest life expectancy in western Europe and a rapidly ageing population. Currently, national statistics publications report on both life expectancy and ageing but do not explore how they might interact. Here we use life expectancy and population structure to examine how Scotland's population has aged in both chronological and thanatological terms and how it will continue to age. We present ways in which these statistics might be used alongside the official statistics currently produced by NRS, in order to identify the challenges and opportunities Scotland faces and to inform policy and planning.

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Measuring if we matter
Johannes Hechler, ONS

ONS ultimately exists to guide policy decisions. But it is very hard to actually measure that impact (if any). We monitor the media, and individuals know anecdotes where a policy used our data. But we have no systematic, complete, quantitative proof that we fulfil our mission. And that for a statistical office! An experimental project aims to change that. Most government papers are available as pdfs on gov.uk and reference the ONS products they use. We run a simple word search for ONS products in every document and record results along with the department, publication date and document type (policy, research, consultation etc.). This way we can track who uses which product - by department, product and over time. Now product owners get a tidy, complete list what impact their data had. Management get tangible evidence how ONS is performing overall. In addition staff get to learn coding in an informal, engaging way. The project can ultimately scan for any product, by any data producer. The talk will explain what the scan does, what it doesn't, show first results, and future steps.

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Elections and electoral geographies

Session organizer: Paul Norman (University of Leeds)

Wednesday 12 September 9.00am

The geography of Australia's Marriage Law Postal Survey outcome
Tom Wilson[1], Francisco Perales[2], Fiona Shalley[1]; [1]Charles Darwin University, [2]University of Queensland

After years of public debate about same-sex marriage, the Australian Government put the issue to the electorate in the 'Australian Marriage Law Postal Survey' in late 2017. The survey asked voters whether the law should be changed to allow same-sex couples to marry. Nationally, 61.6% of voters responded 'yes'. But there were marked variations by electoral division, with the proportion of yes votes varying from 26.1% to 83.7%. The aim of this paper is to explore the geographical pattern of the percentage of voters responding 'yes' by federal electoral division and determine the correlates of the pattern. Results of the survey by federal electoral division were obtained from the ABS; other variables by electoral division were obtained from the 2016 Census. Multiple linear regression was employed to establish the relationship between the extent of yes responses at an electoral division scale and the characteristics of those electoral divisions' populations. In 133 of 150 electoral divisions there was a majority of 'yes' responses. Most of the electoral divisions where 'no' responses dominated were located in western Sydney. Strong predictor variables of the percentage 'yes' vote included the proportion of the population describing themselves as having no religion, the proportion with post-school educational qualifications, the proportion of couples being same-sex couples, and the proportion born in Oceania, Europe and the Americas. To a large extent, the geographical pattern of responses in the Australian Marriage Law Postal Survey can be understood by a small number of characteristics of an electoral division's population.

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Immigrant proximity, ethnocentrism and Radical Right vote: a two-level test of the halo effect in England
Nick Hood[1], Jocelyn Evans[2], Myles Gould[1] and Paul Norman[1]; [1]School of Geography, University of Leeds [2]POLIS, University of Leeds

Literature on the bases to Radical Right voting have posited a so-called 'halo effect' to these parties' support, whereby native populations living in areas adjoining communities with high immigrant populations will be more likely to vote for a Radical Right Party than similar voters in areas themselves having high immigrant density. Whilst this concept builds upon similar theoretical bases to conflict and contact theory, the 'halo' mechanism has not been rigorously operationalised, and has only been tested in some local contexts, in France and Sweden in particular. This paper tests these theories on UKIP using the following research questions: 1) Is it possible to operationalise the halo effect? 2) Does the halo effect have an association with Radical Right voting in the UK? 3) If so, does this relationship hold in full voting models controlling for a number of known relevant factors? This paper builds more sophisticated aggregate and individual models of the halo effect. This is done additively, at first testing the halo effect independently before progressively controlling for key socio-demographic characteristics, additional area characteristics including relative deprivation and economic conditions, and finally a distance measure controlling for the proximity of these immigrant populations. Early results have identified spatial order halo variables have an effect on both Radical Right vote share at an aggregate level and propensity to vote at the individual level (univariate) which hold to a lesser extent when accounting for key socio-demographic factors. Further model specifications will control for the additional factors listed above.

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Changing patterns of UKIP support: Preliminary findings from the SCoRE comparative survey
Myles Gould, Jocelyn Evans, Paul Norman, Nicholas Hood; University of Leeds

Electoral support for the 'radical right' parties such as the French FN, the German AfD, the Dutch PVV and UKIP in Britain have received considerable attention in political science, particularly for those elections where they have been successful (e.g. UKIP prior to the 2016 Referendum on leaving the EU). Comparative research on radical right parties in political science has focused mainly on national-level indicators and individual motivations when explaining variations in support for these parties. Whilst some research has used local data to look at how support varies within individual countries, there has been a notable absence of comparative research that formally and simultaneously examines: the regional and 'neighborhood' contexts, and individual determinants of radical right support. The SCoRE (Sub-National Context and Radical Right Support in Europe) project is developing a multilevel analysis for four countries: France, Germany, the Netherlands and GB. In this paper we report principally on the UK both on analysis of existing available secondary political, demographic and socio-economic data from official sources; and also on the comprehensive SCoRE survey of voting. Fieldwork for the latter was undertaken in the GB just after the 2017 General Election and used the same instrument administered by other partner countries (also in 2017). We use multilevel variance-components models to distinguish between different 'sources' of party support and do so number of different voting outcome measures, as well as demonstrate changes in UKIP support between the 2015 and 2017 General Elections

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Voting cleavages at the 2017 general election: was there a 'youthquake'?
Ron Johnston[1], Charles Pattie[2], Kelvyn Jones[1], David Manley[1]; [1]School of Geographical Sciences, University of Bristol, [2]Department of Politics, University of Sheffield

Some analysts of voting at recent UK general elections have identified a decline, even disappearance, of the traditional class cleavage in the pattern of support for the two main parties, a claim contested by others who argue that such a cleavage still exists but in a new form; the cleavage now reflects not differences in occupational status but rather in educational qualifications, the major route to career success in a post-industrial society. Analysts of voting at the 2017 UK general election then suggested the emergence of a new cleavage by age, termed by some as a 'youthquake'. Were either or both of those cleavages major characteristics of the voting pattern then and, if so, were they new? Deploying a new method of exploring patterns in multi-way contingency tables in the search for intersectionality, this paper uses data from the British Election Study surveys for the last four general elections plus the 2016 Brexit referendum to identify the strength of cleavages by age, sex, and educational qualifications at each contest. It finds evidence for the existence of all three, with the age cleavage becoming more pronounced in 2017.

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Using online e-petition data to estimate EU referendum results for UK Parliamentary Constituencies
Nik Lomax, Stephen Clark, Michelle Morris; University of Leeds

The United Kingdom's 2016 referendum on membership of the European Union (EU) is perhaps one of the most important recent electoral events in the UK. The political sentiment of the electorate, with a narrow vote to leave the EU, confounded pollsters, media commentators and academics alike, and has challenged elected Members of the Westminster Parliament. Unfortunately, for many areas of the UK this referendum outcome is not known for Westminster Parliamentary Constituencies, rather it is known for the coarser geography of counting areas. This has implications because it is Parliamentary Constituencies which return an MP. This paper uses novel data and machine learning algorithms to estimate the Leave vote percentage for these constituencies where it was not reported. We utilise information on political sentiment captured by signatories to UK government e-petitions as input data. A range of machine learning algorithms are tested on these data which provides methodological advances beyond traditional regression or ad-hoc approaches. We highlight that such methods are just one of a range of modelling approaches and there is scope for political scientists to apply machine learning algorithms to gain confirmatory or alternative insight in a range of different applications. Our

results are found to correlate well with other estimates which use different methods and data to those outlined in this paper.

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Ethnicity, religion & inequality

Session organizer: Fran Darlington-Pollock (University of Liverpool)

Tuesday 11 September 9.00am

The spatial division of occupation categories: Analysis for ethnic groups in England and Wales
Sarah Garlick, University of Liverpool, Department of Geography and Planning

This paper contributes to ongoing ESRC North West Doctoral Training Centre-funded PhD research into 'Geographic inequalities in ethnic minority and immigrant labour market experiences in England and Wales'. The paper explores the relationship between ethnic group and broad occupation categories at national and local scales, having applied quantitative spatial analysis methods to Office for National Statistics' 2011 Census data for Middle Layer Super Output Areas [MSOAs]. At the national level, Indices of Dissimilarity have been calculated for each ethnic group resident population within an occupation category, comparing employed residents in each ethnic group to White British ethnic group residents. For MSOAs, Interaction Indices compare the ethnic diversity of employed residents in each occupation category whilst Location Quotients compare the proportion of each MSOA's occupation category population who were from a particular ethnic group to the same proportions nationally. The Indices of Dissimilarity provide a national view of the extent that an occupation category's employed residents from different ethnic groups were evenly distributed residentially. For example, within the Professional Occupations category residents from the Bangladeshi ethnic group were found to be more separate and residents from the White Irish ethnic group least separate from the White British ethnic group. The Interaction Indices highlight local variations in the ethnic diversity of employees within different occupation categories, whilst the Location Quotient figures highlight locations where employed residents from an ethnic group were under- or over-represented in an occupation category compared to the overall population of England and Wales.

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How many Jews are really there? When the national census and genetic testing come together
Daniel Staetsky, Institute for Jewish Policy Research

How many Jews live in the UK? In Europe? In the whole world? There are simple answers to these questions, from the demographic canon: in the UK-about 290,000, in Europe- 1.4 million, in the world-14.5 million. How does one know the number of Jews existing in the world, or in the UK, for that matter? Today, this knowledge comes from the same sources that tell us how many people exist in general: censuses and population surveys. In absence of these, administrative sources on Jewish communities are explored by demographers. The multitude of sources notwithstanding, there has been an incessant conversation in the Jewish community about the imprecise measurement of Jewishness at the national level, as rendered by the census. 'There may be more Jews out there than meets the eye'-such is the gist of the recurring claims. This paper will discuss the reasons to believe the national Census as well as the reasons to doubt it. It will focus on the United Kingdom as a case study of a larger, disciplinary problem of Jewish demography. The paper will supplement the UK census data with data from the large scale genetic testing undertaken across the world by 'MyHeritage'-a company offering genetic testing and ethnicity estimates for its users across the globe. These data will be presented to demographers for the first time in history of this subject, and they allow quantification of the proportion of people with Jewish roots living today in the UK.

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The transition into sustainable employment for Turkish and Moroccan women in Belgium
Julie Maes, Jonas Wood, Karel Neels; University of Antwerp

Belgium is characterized by the largest employment gap between non-European migrant women and native women in the EU15. Further, the Belgian labour market is highly segmented and non-European origin women are overrepresented in precarious employment sectors with low wages. These employment gaps already emerge at the beginning of the professional career, which is worrisome, since early disadvantages in (sustainable) employment have a considerable impact on labour market positions and social protection at later stages of the life course. Therefore, this contribution uses unique longitudinal register data from the MIA Panel (2005-2016) to study early labour market differentials between native women and women of Turkish and Moroccan origin in Belgium (Flanders). Focussing on women of the intermediate and second generation who have finished their education in Flanders, we assessed whether there are differences in i) the transition into sustainable employment, ii) the sector of first sustainable employment, and iii) the duration of first sustainable employment. In addition, we assessed whether and to which degree these differentials can be explained by individual attributes, as well as household and parental characteristics. Results indicate that after controlling for individual, household and parental characteristics differences with natives in accessing sustainable employment decrease and are no longer significant for intermediate generation Turkish women. Regarding sector of first sustainable employment, we find significant ethnic differentials. Finally, the probability to become unemployed or inactive after sustainable employment is significantly higher for Turkish and Moroccan women than for Belgian women, even after controlling for individual, household and parental characteristics.

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Exploring the morbidity-mortality paradox among South Asians in Britain
Matthew Wallace[1], Fran Darlington-Pollock[2]; [1]INED, [2]University of Liverpool

Immigrants from India, Pakistan, and Bangladesh are three of the most important foreign-born populations in Britain. Interestingly, the morbidity-mortality literature on South Asians documents higher limiting long-term illness (LLTI) rates yet lower mortality than the UK-born. Such an inconsistency may be down to differing definitions, time periods, and age-ranges. However, given that LLTI has been proven to be an effective proxy for mortality, such an inconsistency remains striking. We investigate whether the paradox is real i.e. are South Asians living longer, but in worse health, than the UK-born (which would impact demand for health services and require culture-specific health policies) or whether it is generated by overestimation of LLTI, or underestimation of mortality. To achieve this, we calculate age-adjusted and age-specific LLTI and mortality incidence rate ratios through Poisson regression by sex, using the age range 20-24 up to 85+ for Indians, Pakistanis and Bangladeshis, using a consistent definition (country of birth) and period (2010-2012). Death and population counts are taken from the 2011 Census and Office for National Statistics Mortality tables; LLTI and population counts are taken from a 5% sample of the 2011 Census. We observe this morbidity-mortality paradox in all groups except Indian males. The paradox begins emerging around age 40. This paper informs future work wherein we use individual-level, longitudinal data to track South Asians and UK-born by their linked LLTI-mortality status. This will reveal in mortality (rates, time-to-death, and cause of death) among South Asians relative to the England and Wales-born according to their LLTI status.

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Families and households

Strand organizer: Alice Goisis, London School of Economics

Marriage & fertility patterns in less developed countries – Monday 10 September 1.30pm

Family formation in conflict: Exploring fertility and marital Change in post-Soviet Azerbaijan and Tajikistan
Orsola Torrisi, London School of Economics

Within the literature on family formation dynamics in the post-Soviet world, fertility and marriage changes in Central Asia and the Caucasus have been poorly documented, particularly in conflict-ridden Azerbaijan and Tajikistan. This study provides a detailed account of trends and patterns in family formation and structure from independence to recent years in the two countries, with a focus on the changes associated with conflict events. Collating evidence from various sources, including birth and marital histories from Demographic and Health Surveys, Multiple Indicator Cluster Surveys and Living Standards Surveys, census and vital registration data, this study first establishes the temporal pattern in TFR. Then, it retraces patterns in fertility by age, child sex, conflict-related variables and parity using the synthetic cohort method. Third, it investigates the contribution of changing marriage on fertility. Survey estimates indicate that the Tajik fertility transition has been modest. Period declines are associated with the onset and development of conflict and other national crises. Marriage rates dropped considerably in conjunction with conflict years and recovered only in the early 2000s. Between 2006-2011, fertility increased by 13 percent, mainly due to rising childbearing at young ages. In Azerbaijan, the decline is more visible: fertility dropped by 0.8 child per woman during the peak conflict years (1991-1994), effected through a decline in high-order births. Reductions were primarily driven by declining TFR among young conflict-affected women, suggesting immediate disruptive effects of processes like forced displacement. This was followed by birth recuperation for affected women, so that in 2005, they had approximately 1 child more than unaffected women. These findings have important implications for women's status and empowerment in in-transition and conflict-ridden zones.

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Patrilineal fertility and marital bargaining power in Egypt
Mariam Abouelenin, Yang Hu, Karen Broadhurst; Lancaster University

The majority of research on conjugal power relations has been informed by Blood and Wolfe's (1960) resource theory. The basic premise of resource theory is that, within marital relationships, spousal decision making power is dependent upon the amount of resources each spouse contributes to the marriage. In this paper, we explore power differentials between husband and wife, imposed by the Egyptian patrilineal kinship structure and expressed in conjugal decision making. Using the nationally representative Egypt labour market panel surveys (2006-2012) along with multilevel modeling, we look at the way(s) in which women in Egypt attempt to maximize their bargaining power and contribution to the decision making process in the household. However, instead of the traditional sources of bargaining power analysed in the literature; we suggest a novel channel through which women may increase their autonomy and participation in household decision making, namely by using the birth of a son as a prop to their bargaining status. Examining relations within the household and identifying the drivers of bargaining power will have crucial implications for understanding how resources (material and symbolic) are distributed within the family, in terms of major dimensions of family decisions. This study aims to highlight the fact that symbolic resources may be at least as important as material resources in determining conjugal power in patrilineal family systems.

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Missing marriage? Changing marriage patterns in the context of rapid fertility decline in Myanmar
Anne Schuster, Sabu Padmadas, Andrew Hinde; Department of Social Statistics and Demography, University of Southampton

The increasing trend in proportions of never marrying may contribute to fertility decline across Asia. In Myanmar, where the total fertility rate fell from 4.7 to 2.3 children per woman between 1983 and 2014 without widespread use of family planning, changing marriage patterns are particularly important. Data from the 2015-2016 Myanmar Demographic and Health Survey are used to investigate associations between education, socioeconomic status and postponement of marriage/never marriage for men and women in Myanmar. Groups are compared according to their current status. Compared to ever married women, never married women are more likely to live in urban areas, be more educated, work, and fall into a higher wealth quintile. Patterns were similar among men, although relationships were not statistically significant. There is evidence of delayed marriage among men with higher education, but nearly all men eventually marry. Nearly one-third (32.8%) of women with secondary or higher education never marry. These results are consistent with a scenario in which improvements in women's education and economic standing led to a new group of higher educated and wealthier women who are unable to find partners of similar status in Myanmar. This trend is exacerbated by a marriage squeeze caused by heavier mortality among young adult males, which may be associated with conflict and civil unrest. Additional current status analysis is planned to provide further insight into how these trends have changed across different generations and how changing marriage patterns contribute to falling fertility in the country.

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Unpacking the differential impact of family planning policies in China: Analysis of parity progression ratios from retrospective birth history data, 1971-2005.
Min Qin[1], Jane Falkingham[2], Sabu Padmadas[3]; [1]ESRC Centre for Population Change; Centre for Research on Ageing, University of Southampton, [2]ESRC Centre for Population Change, University of Southampton, [3]Sabu S. China Research Centre; Centre for Global Health, Population, Poverty & Policy and Department of Social Statistics and Demography, University of Southampton

Although China's family planning programme is often referred to in the singular, most notably the One-Child policy, in reality there have been a number of different policies in place simultaneously, targeted at different subpopulations characterized by region and socioeconomic conditions. This study attempted to systematically assess the differential impact of China's family planning programmes over the past 40 years. The contribution of Parity Progression Ratios to fertility change among different sub-populations exposed to various family planning policies over time was assessed. Cross-sectional birth history data from six consecutive rounds of nationally representative population and family planning surveys from the early 1970s until the mid-2000s were used, covering all geographical regions of China. Four sub-populations exposed to differential family planning regimes were identified. The analyses provide compelling evidence of the influential role of family planning policies in reducing higher Parity Progression Ratios across different sub-populations, particularly in urban China where fertility dropped to replacement level even before the implementation of the One-Child policy. The prevailing socio-economic conditions, in turn, have been instrumental in adapting and accelerating family planning policy responses to reducing fertility levels across China.

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Housing & demographic processes – Monday 10 September 4.45pm

Getting back on the housing ladder? Separation and homeownership in Britain
Hill Kulu & Julia Mikolai, University of St. Andrews

Divorce and separation have become common life events in Britain. Previous research shows that separated individuals move from homeownership to (private) renting and experience a period of residential instability. However, little is known about whether and when separated individuals return to homeownership. This paper investigates homeownership levels among separated individuals in Britain. We use data from the British Household Panel Study and apply multilevel logistic

regression models. Our preliminary analysis shows that separated individuals are much less likely to own a home that those who are married or cohabit. Interestingly, homeownership levels increase over time since separation; however, the levels increase among those individuals who repartner, whereas homeownership rates remain low among non-partnered separated individuals. The study supports that separation has a long-term effect on individuals' housing careers. Our further analysis will investigate patterns by gender and across socio-economic groups.

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The transition to parenthood among Britain's 'Generation Rent': Examining the changing role of housing tenure
Valentina Tocchioni[1], Ann Berrington[2], Daniele Vignoli[2], Agnese Vitali[2]; [1]University of Florence, [2]University of Southampton

A positive link between homeownership and fertility is usually presumed. Nevertheless, couples' preferences to become homeowners before having their first child has been undermined by the dramatic changes in the UK housing market over recent decades. In Britain in particular, home-ownership rates have fallen dramatically among young adults as a result of low wages, precarious employment, reductions in the availability of mortgage credit, lack of affordable homes, and rising house prices. Using prospective longitudinal data from the eighteen wave of British Household Panel Survey (1991-2008) and the first seven waves of United Kingdom Household Longitudinal Survey (2009-2016) on a sample of women aged 18-42 and applying multilevel discrete-time event-history techniques, we investigate whether and how the link between housing tenure and timing of first births has changed over recent decades in Britain, and whether the link is moderated by local area characteristics including housing markets. We find that, in comparison to the 1990s, private renters are nowadays more similar to those in owner occupation in terms of their likelihood of entering parenthood. By including a contextual variable on house prices, the predicted probability of conceiving a first child remains higher for homeowners compared to private tenants, but the context plays a role in shaping the propensity to childbearing. Increasingly, young people remain in insecure private rented accommodation even during the process of family formation and parenthood.

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Generational geographies and housing inequalities in England and Wales
Albert Sabater, Elspeth Graham, Nissa Finney; Department of Geography and Sustainable Development & ESRC Centre for Population Change, University of St Andrews

In the UK context, housing inequality is currently depicted in terms of the 'housing haves' and the 'renting rest', with increasingly divergent housing/residential locations between older and younger generations. While age is an important driver of spatial sorting, little is known about the effect of housing inequality on the age mix of neighbourhoods. This paper assesses the contribution of housing inequalities to spatial separation by age over time. Drawing on housing information from the 2001 and 2011 Censuses, along with house price data for England and Wales, we investigate the relationship between residential age segregation and housing (dis)advantage. First, we examine change in residential segregation between groups of older and younger adults across all Output Areas (181,408) in England and Wales, with special attention to change at sub-district level, as well as in urban compared to rural areas. Second, we fit hierarchical linear models with random intercepts at region, district and MSOA-within-district-region levels. Our findings indicate that spatial unevenness between older and younger age groups has increased during the 2000s. Rising house prices have had a significant deleterious effect on the age mix of neighbourhoods over time, with results suggesting that this is not simply a 'London effect'. Findings also suggest that an increase in homeownership levels in an area promotes residential mixing whereas an increase in the proportion of renters reinforces residential age segregation. Since the drivers of generational geographies go beyond housing inequalities, the potential challenge to policies of social cohesion underlines the importance of further research.

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Childlessness: Determinants & consequences – Tuesday 11 September 1.30pm

What are the determinants of intentions for childlessness?
Anna Rybinska, University of North Carolina at Chapel Hill

The results from the latest National Survey of Family Growth indicate that the prevalence of the intentions for childlessness among young respondents in America is increasing. At the same time, empirical studies provide evidence that intentions for childlessness serve as a strong predictor of subsequent permanent childlessness. Despite the rising prevalence of intentions for having no children among younger cohorts, and their strong connection to permanent childlessness, little is known about what contributes to the development of such reports. In this project, I examine the determinants of intentions for childlessness for a cohort of Americans who participated in the 1979 National Longitudinal Survey of Youth. The effects of the changes in marital histories, professional careers, and educational enrolment on the likelihood of reporting an intention for childlessness are explored. Random effects models are used to capture the dynamic nature of respondents' lives. For women, I find negative effects of educational attainment, marriage and cohabitation, and employment on reports of childlessness intentions over the life course. In contrast, only negative effects of educational attainment and employment are observed for men. Interestingly, while for women union formation is linked with lower likelihood of reporting intentions for childlessness, for men union dissolution is linked with higher likelihood of reporting an intention for childlessness. This paper adds new insights to existing literature on childlessness by situating the change of childbearing intentions within the dynamic context of one's life and by understanding differences in reporting childlessness intentions across gender, race/ethnicity, and social class.

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The other half of the story: A mixed-methods exploration of male childlessness in Colombia in comparative gender perspective
Cristina Perez, University College London

Over the course of two generations, Colombian society has transitioned from rural to urban, from average family sizes of seven children per woman to just two, and from low levels of women's education to an environment where female students now consistently outperform males, and most women work outside the home. Yet, based on my previous research, this expanded landscape of female options does not appear to have triggered a widespread rejection of motherhood. Although women's fertility is subject to sustained demographic interest, we know far less about men's reproductive experiences, and particularly about male childlessness unrelated to infertility outside of Euro-America. In 2015, the Colombian Demographic and Health Survey (DHS) asked men (aged 15-59) about their reproductive histories for the first time; using descriptive statistics and generalised linear modelling, I establish levels of male childlessness across the life-course, and identify which men are most likely to be childless around ages 30 and 50. I also explore the extent to which male childlessness is voluntary or involuntary, and how these patterns compare with DHS data for Colombian women. Finally, I contextualise these broad patterns using data from in-depth life history interviews I conducted with a small group of men and women (N=35) in Bogota. My preliminary analysis has established that men consistently report higher rates of childlessness than women, and that childless men experience substantially less social pressure to parent than their female peers. With this work, I aim to contribute to a gender-sensitive anthropological demography of childlessness in non-Euro-American contexts.

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Childlessness in sub-Saharan Africa from 1986 to 2016: Trends and correlates

Florianne C. J. Verkroost, Christiaan W. S. Monden; Nuffield College, Department of Sociology, University of Oxford

Childlessness has gained interest because women increasingly remain childless. As subsequent female cohorts caught up with men educationally and professionally, the proportions of voluntarily childless women and circumstantially childless men selected out of relationships have increased in high-income countries (HIC). Additionally, infertility and involuntary childlessness have decreased due to improved healthcare. The literature has ignored Sub-Saharan Africa (SSA) because of its high fertility rates. However, this region is experiencing development in terms of education, wealth and health. Can trends similar to those in HIC be observed in SSA? Most childlessness research has ignored men, although men substantially contribute to childlessness. Moreover, gender differences in the drivers of childlessness seem to exist in HIC. We aim to understand how development and different types of childlessness are associated; how different types of childlessness have evolved over time; what the individual-level correlates of childlessness are; and what gender differences exist in this respect. We use the Demographic Health Surveys collected between 1986 and 2016 throughout 37 SSA countries. We estimate random effects probit models for women and men aged 40 and older. Our results suggest that female childlessness has decreased from 3.3% in 1986 to 3.0% in 2016 and that male childlessness has increased from 2.3% in 1991 to 3.6% in 2016. Additionally, development and birth cohort are inversely associated with involuntary childlessness for women. For men, development and birth cohort are positively associated with circumstantial childlessness. We discuss possible explanations for our findings and provide further evidence for plausible mechanisms.

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Intimate partner violence among women in Nigeria: A correlate of childlessness

Ololade Baruwa, University of Witwatersrand

Intimate partner violence among women in Nigeria is increasing over the years despite the implementation of policies that have been established by the government and NGOs to combat it. This suggests that there are various factors strengthening the prevalence of intimate partner violence. Hence, this study examines the potential impact of not having a child on intimate partner violence in Nigeria. Data for this research was derived from ever-married women age 15-49 who participated in the Domestic violence module of 2013 Demographic and Health Survey of Nigeria. Data was analyzed using descriptive, chi-square and binary logistic regression model. Results showed that not having a child is not a predictor of emotional violence (OR; 1.73, P-value =0.000). Other covariates found to be significant include; age, religion, education, place of residence, regions and wealth index. In conclusion intimate partner violence is highest among with children compared to women without children.

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Understanding the determinants & consequences of family structure – Wednesday 12 September 9.00am

The employment and economic situation of cohabiting and married parents across Europe

Anna Garriga[1], Brienna Perelli-Harris[2]; [1]Pompeu Fabra University, [2]University of Southampton

The growing prevalence of cohabiting couples with children is one of the most widely observed family changes experienced by Western societies in the last half century. As the prevalence of cohabiting families has increased, socio-economic differences have become more pronounced. Recent studies have found that in the United States, diverging class patterns in family behaviours can be explained by the rise in economic inequality. Several studies show that cohabiting parents have worse job quality and greater economic insecurity than their married counterparts. However, few studies examine the relationship between job and economic insecurity and union formation practices in Europe. This paper aims to address these gaps in the literature by using EU-SILC data from 2012 and 2016. For both mothers and fathers, we study the

relationship between different dimensions of employment and economic conditions, for example, employment and occupational status, and temporary versus permanent contracts. Preliminary findings indicate that cohabiting parents have a worse position in the labour market than married parents in most European countries, but important differences between countries are also observed. The results of multivariate analysis indicate that while parental education is significantly related to union status in some countries, these associations are explained by the parents' employment situation and economic conditions. Parents' employment situation (especially the father's) seems to be more important than education for the likelihood of being in a cohabiting union.

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Educational outcomes for children of re-partnered parents: Evidence from Sweden
Anna Tegunimataka, Jonas Helgertz; Centre for Economic Demography, Lund University

The educational outcomes for children are strongly influenced by their family background. Traditional models focus on the role of the biological parents in outlining what arguably constitutes an essential set of background characteristics. For many children and adolescents, family background is, however, a more complex phenomenon. More specifically, substantial shares of children spend parts of their upbringing in different family constellations than those they were born into, due to rising rates of divorce and parents subsequently re-partnering. The aim of this paper is to study the consequences of re-partnered parents and we ask how parental re-partnering either through marriage or cohabitation, affect children's school performance. We focus on the experiences of individuals in Sweden using population register data. Our data contains all individuals born in Sweden between 1975 until 1995. We link information about parents, divorce, re-partnering of parents, siblings, and stepsibling and examining effects of divorce and new family constellations on school performance, through GPA, standardized test scores at age 16. Sweden is the focus of our study since it has had an early rise in divorce rates, been a forerunner in terms of cohabitation, and childbearing out of wedlock. Initial results find negative effects on grades of divorce, but for those children where the new partner of the parent brings increased socioeconomic resources to the household, we find positive effects on the child's educational outcomes.

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Dynamics of children's living arrangements and caregiver churn in communities with high HIV prevalence in South Africa
Gabriela Mejia-Pailles[1,2], Victoria Hosegood1,[2,3], Kathy Ford[4], Ann Berrington[1,3]; [1]ESRC Centre for Population Change, University of Southampton [2]Africa Health Research Institute, University of KwaZulu-Natal, [3]Department of Social Statistics and Demography, University of Southampton, [4]School of Public Health, Michigan State University

This paper examines the dynamics and patterns of caregiving during childhood in a rural South African community experiencing high levels of adult migration, low levels of marriage, union instability and separation, and a severe HIV epidemic. Using longitudinal data available from the Africa Health Research Institute Demographic Surveillance System, we analyse the dynamics of children's living arrangements according to whether they are living with both parents and the churn in their caregivers between the period 2005-2015. Given the high levels of HIV experienced in the communities in the study area, we consider caregiving dynamics in orphans and non-orphans separately. We pay particular attention to the stage of the HIV epidemic in the area - from treatment introduction in 2004/5, treatment scales up in 2007, to the characteristics of a mature epidemic in recent years. We examine how changing patterns of parental mortality relate to experiences of caregiving for children under 18 years. Despite substantial gains in adult mortality since ART (antiretroviral therapy) roll out in this community, results show that non-parental living and caregiving arrangements are commonly experienced by most children irrespective of parental survival. The majority of children in the study population experienced at least one change in their primary caregiver within the observation period. A smaller proportion of children experience multiple and rapid changes in caregivers. The extent of 'churn' in children's caregiving dynamics provides challenges for policies and programmes seeking to identify and reach children's caregivers.

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Feminist quantitative science

Strand organizer: Heini Vaisanen (University of Southampton)

Tuesday 11 September 9.00am

Women on the move: Administrative data as a safe way to research hidden domestic violence journeys
Janet C. Bowstead, Department of Geography, Royal Holloway, University of London

Domestic violence against women is a significant social issue within the UK, across Europe and globally. However, it is often difficult to research given the hidden nature of the violence, and the need for many women to continue to keep their experiences secret because of ongoing risk from a known abuser, typically a male partner, husband or ex-partner. Whilst administrative data will not indicate the total scope, incidence or prevalence of hidden abuse, they can be used to generate significantly increased knowledge about women who do access services; and provide much larger samples than would be available from survey or qualitative methods. This paper presents research on women's relocation journeys to escape domestic violence in the UK, using administrative data from a funding programme which required England-wide monitoring from 2003-2011 on housing-related support services. This provided a sample of over 20,000 women per year, a total of over 140,000 journeys to access services, until the data became unavailable due to the end of the funding programme. The presentation will include some of the substantive findings on women's domestic violence journeys, on patterns and places as well as demographics, which had not previously been able to be researched. It will also highlight that many countries will have similar administrative data from monitoring service funding programmes, which could enable similar research on women and children's hidden journeys as they seek safety from domestic abuse. However, such data are rarely aggregated or archived and made available for research, and the opportunity is missed.

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Demographic approaches to the understanding of gender based violence: age, life course and intersectionality
Stephanie Condon, INED

The dissemination of findings from surveys investigating gender-based violence (GBV) has contributed to a wider recognition of the relevance to gender studies of quantitative methodologies and statistical measurement of social phenomena. Demographic studies of GBV, by focusing on age-related or generational experience of violence, locating violent acts within specific interpersonal relationships, during a given period and in their social and biographical contexts, offer the possibility of examining how different characteristics and life course events interact to place certain individuals more or less at risk of experiencing GBV. A recent challenge to such surveys has been how to capture information allowing the role of intersectionality to be analyzed. In the French context, as is the case for studies of racial discrimination, the absence of data on ethnicity is seen to constitute an obstacle to analyzing the particular vulnerability of BAMER women. However, following on from previous surveys on GBV conducted by teams of demographers in France, a survey underway in three French overseas territories will provide an opportunity to focus on the ethnic/racial dimension of intersectionality and its link with experienced violence, at the same time as highlighting the importance of considering the time dimension. This paper will discuss the different indicators of current, childhood and lifetime prevalence of GBV and how variables describing demographic characteristics, social position and life course events enable us to situate experiences within individual biographies and evaluate the impacts of contextualized gender relations, as well as changes in these over time.

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Does women's empowerment reduce the risk of intimate partner violence? Findings from the Zimbabwe Demographic Health Survey, 2015
Annah Bengesai, University of KwaZulu-Natal

Violence against women is a far reaching and multifaceted societal problem which affects more than a third of women globally. Accordingly, there has been an increase in the research which has sought to understand its scope, the bulk of which has been based on non-probability sampling. Emerging social complexities, coupled with the pervasiveness of the problem continue to make violence against women an important area of study. The aim of this research is to contribute to the field by estimating the association between women empowerment and intimate partner violence (IPV) in Zimbabwe using a population based data set (the 2015 Zimbabwe Demographic Health Survey (ZDHS). The sample was constituted from 3499 women in the reproductive ages 15-49. A composite index of women empowerment (WEI) was developed using five indicators: education, cash earnings, household decision making, and ownership of land or a house. The results show that overall, the prevalence of IPV in Zimbabwe was 38%, while the prevalence of emotional, physical and sexual violence was 31%; 30% and 11% respectively. The results from the multivariate analysis did not support the priori hypothesis that women empowerment has protective effects on IPV as women with a low WEI were found to be less likely to experience all forms of intimate partner violence as opposed to those women with a high WEI. Wealth quintile and age were also significantly associated with IPV. These findings also point to the multidimensional nature of IPV and suggest that there is need to rethink women's empowerment beyond the economic.

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With age comes...? Gendered pathways into late parenthood in Norway
Wendy Sigle[1], Oystein Kravdal[2]; [1]London School of Economics, [2]University of Oslo and Norwegian Institute of Public Health

Using high-quality register data, this paper constructs an empirical portrait of changing pathways into late parenthood in contemporary Norway, using a gendered perspective to assess whether older parents are better-resourced parents. Like most family issues, academic and policy discussions of late parenthood have tended to focus on the experiences of women. Although late motherhood was not uncommon in previous generations, rapid social and family changes in recent decades mean that today's late mother is far more likely to be having her first child. She may have focused on obtaining a good education and then on establishing her career and finding a supportive partner. When viewed through this motherhood lens, older parents are often portrayed as being relatively well-off financially and enjoying stable family lives. Viewed through the fatherhood-lens, however, late parenthood appears potentially more diverse and complex. Some older fathers may have delayed the transition to parenthood; others may be completing their first family with high order births. Evidence has shown that the likelihood of forming a second family is higher for men than for women. As age differences tend to be narrowest in first partnerships, we might expect to see relatively more late fatherhood than late motherhood in second and higher order partnerships. If the well-documented disadvantages and vulnerabilities associated with serial families are more typical of families with older fathers than with older mothers, parental age might not be the same marker of socio-economic advantage and relationship stability for fathers as it is for mothers.

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Changing work-family life courses: On inferring gender equality
Jenny Chanfreau, London School of Economics

This paper investigates how gendered work-family life courses have changed over time in the UK and draws on gender theory to think critically about what a reduction in the gap between women and men's outcomes might mean in terms of gender equality. Past research suggests that men and women's work trajectories are converging, largely because women are increasingly adopting more male-typical employment patterns. However, over the same time period, the UK has also seen a delay in the transition to parenthood, with the extent of that delay differing by level of education. As a key component of the gender difference in labour market outcomes and trajectories is the gendered effect of parenthood on

labour market activity, this raises a number of questions. Has the timing of the point in the life course at which gender inequalities emerge merely been delayed or have the differences between women and men reduced also after the transition to parenthood? To what extent do the patterns of change differ by level of education? The analysis draws on employment and birth history data from four UK surveys, the English Longitudinal Study of Ageing (ELSA), the 1958 and 1970 Birth Cohort Studies, and Understanding Society. The results reveal different patterns of change over time when analysing the life course by chronological age and when looking separately at the early parenthood phase. The findings will contribute to debates about increasing gender equality in labour market outcomes over the life course.

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Fertility and reproductive health

Strand organizers: Alyce Raybould, Rachel Scott (London School of Hygiene & Tropical Medicine)

Sexual and Reproductive Health - Monday 10 September 4.45pm

Contemporary patterns of unintended pregnancy resolution in low- and middle-income countries
Heini Vaisanen[1] & Ewa Batyra[2], [1]University of Southampton, [2]London School of Economics

Around 40% of pregnancies worldwide are unintended, and approximately half of those are terminated. Few international comparisons of unintended pregnancy (UIP) resolution (choosing birth or abortion) exist. We used Demographic and Health Surveys collected in 12 countries to analyse which characteristics (e.g. desired family size, family gender composition, parity, socio-demographic characteristics) were associated with the likelihood of experiencing an UIP; and giving birth or having an abortion. We analysed these data using multinomial and binary logistic regression. In most countries, having more than two children was positively associated with UIPs. Those who had more children than their ideal family size were more likely to report UIPs than those who had exactly the ideal number. Interestingly, so were those whose current family size was smaller than the ideal. Among women who had an UIP, having one child was negatively associated with the odds of aborting. In some countries, women who reported having more children than their ideal family size were less likely to abort than women who reported having their ideal family size. Gender composition of current family affected UIP and abortion decisions less than we expected. In some countries, women preferred having children of both genders, but evidence of son preference was weak. The results reflect determinants of abortion and UIP, but also the culture around reporting and stigma: both UIP and abortion are typically underreported. These results are of importance, as few other international comparisons of this topic exist, although they show how context affects women's choices of pregnancy resolution.

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Exploring the local variation in England's teenage fertility reduction, through two decades of dramatic decline
Katie Heap, Ann Berrington & Roger Ingham, University of Southampton

Teenage fertility in England has dramatically reduced throughout the last two decades, although continues to be higher than many European countries. England's teenage fertility rate declined by around 30 percent between 1998 and 2008, but more than halved between 2008 and 2016. Such declines are often attributed to the Teenage Pregnancy Strategy (TPS), a ten-year UK Governmental strategy. This paper considers changes in teenage conceptions and the proportion ending in abortion in the wider U.K. context involving various societal changes: rising post-compulsory educational aspirations; changing teenage ethnic composition; declining housing affordability leading to the postponement of permanently leaving the parental home; and increased deprivation associated with economic recession and Government austerity post-2008. Teenage conception rates and abortion ratios for each of England's 324 Local Authority Districts (LAD) are explored using random intercept linear regressions to identify variability within and between LADs. Panel regression is used to explore the relationships between LAD-level characteristics and our outcomes, and whether associations altered throughout 1998-2016. Most LAD-level characteristics were consistently associated with teenage conception rates and abortion ratios, including LADs: deprivation, educational attainment and housing affordability. The greater teenage conception rates for Inner London and abortion ratios for Inner and Outer London are consistent even when controlling for our LAD-level characteristics. The next steps involve exploring within-LAD variation in teenage conception rates and abortion ratios including their relationships with LAD-level characteristics using fixed-effect models. This project aims to further explore the random and fixed effect models relationships when including each LADs TPS funding.

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Taking a close look at unmet need for contraception: the role of sporadic sex among young women in
Mexico
Fatima Juarez[1], Cecilia Gayet[2], Gabriela Mejia-Pailles[3]; [1] El Colegio de Mexico, [2]FLACSO Mexico, [3]University of Southampton

Mexico has been widely recognized for the public contraception program that reduced fertility. In the decade of the 1970s, the Population Law endorsed the use of contraception and launched a national family planning program. Contraceptives were made available for the whole population free of charge, fertility strongly reduced and contraceptive prevalence increased. Nevertheless, among young women fertility and unplanned pregnancies remain high. Research on young people's unmet need for contraception is very limited, as is research on their reasons for not using contraception. For the first time, it is possible to estimate unmet need for contraception with an international algorithm using the 2014 Mexican National Survey on Demographic Dynamics. The objectives of this study are: a) to estimate the level of unmet need among young women in Mexico and the influence of socio-economic and demographic variables, b) to examine in-depth the reasons for not using contraceptives, and c) to explore the factors associated with reasons for not using contraception. Results show that pregnancy among adolescents and young people is a constant concern in Mexico. Contraceptive use is low, and unmet need is high for both young married and not married women. The importance of examining subgroups and all barriers that may be preventing young people from using contraceptives points to sporadic sex as the most common reason cited by Mexican young women.

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Son preference and prenatal sex-selection against females in the UK
Sylvie Dubuc and Bernice Kuang, University of Reading

Sex-selection against females is well documented in India. This pattern has been paralleled in the UK, where previous analysis of birth registration evidenced a male biased sex ratio at birth (SRB) among India-born women over 1990-2005. This paper presents an update of the SRB trend among the predominant British South Asian groups (Indian, Pakistani, Bangladeshi). However, because SRB varies with fertility, SRB alone is an insufficient indicator of the prevalence of prenatal sex-selection (PSS). To this end, we implement a novel calculation of the propensity to practice PSS (using modelling by Dubuc and Sivia) among these groups. Preliminary findings show a stabilisation of the SRB to India-born mothers from 2006 onwards, potentially announcing the beginning of a reversal. Preliminary results of the propensity calculation support this scenario and show lower PSS against females among India-born women in the UK when compared to women in their region of origin. We will extend our analysis up to 2016 to test further our hypotheses (work in progress). We further explore son-preference among women of Indian, Pakistani and Bangladeshi heritage through gender-based parity progression analyses showing contrasting patterns. Results are discussed from a transnational perspective, and in the context of the UK debates on sex-selective abortion.

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Fertility determinants in low- and middle-income settings – Tuesday 11 September 9.00am

Child marriage and early fertility: Causal evidence from the Ethiopian Child Marriage Ban
Jorge Garcia-Hombrados and Alice Goisis, LSE

This study uses age discontinuities in exposure to a law that raised the legal age of marriage for women in Ethiopia to investigate the causal links between underage marriage bans, child marriage and early fertility. Using a regression discontinuity design approach, results suggest that exposure to a legal age of marriage at 18 reduces underage cohabitation by 20 percentage points and delays in two years the age at first cohabitation. The increase in the age at birth caused by a one-year delay in women's age at cohabitation during teenage years is estimated at 0.52 years.

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Son preference, parity transition and birth spacing
Mazhar Mughal and Rashid Javed, University of Pau

Son preference is widely practiced in South and East Asia. It demonstrates itself in such sex-selection methods as differential stopping behavior and sex-selective abortion. One way in which this disproportionate desire for sons could manifest itself is differential birth spacing. The waiting span before moving to next pregnancy may be low as long as sons are not born. Shorter birth spacing leads to higher demand on the mother's body leading to higher health risks to mother and child. In addition, there is a greater competition among siblings for parental care and resources. We study this phenomenon by using three demographic and health surveys of Pakistani households covering the period from 1990-91 to 2012-13. We seek to address the following research questions: Does preference for sons affect birth spacing? Has this relationship evolved over time? Does it depend on the number or proportion of sons born? In which type of households does this phenomenon appear to be more potent? Does son preference increase the probability of risky births (those before 24 or 18 months of previous birth)? Using parametric, semi- and non-parametric estimation methods, we find strong evidence for differential behaviour among households throughout the period. Birth spacing differences vary substantially by parity and number of children. The phenomenon is more prevalent among households that are wealthier or nuclear and among older, more educated women with higher say in intra-household decisions. There also is evidence of riskier births resulting from son preference.

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Son preference, sex-selection and fertility effects on sex-composition: Findings of a theoretical model and its application to India.
Sylvie Dubuc & Devinderjit Sivia, University of Reading

Building on previous work conceptualising the role of fertility reduction on prenatal sex-selection practice, we use mathematical model to investigate the non-trivial relationship between fertility, birth order of sex-selective intervention, sex-ratio at birth and proportion of couples intervening in a population. We demonstrate that sex ratio at birth bias is an inappropriate indicator to gauge prenatal sex selection behaviour within a population. We show that sex ratio at birth bias can increase despite fewer sex-selection interventions occurring, because fertility decline not only impacts on the risk of remaining son-less but also disproportionally amplifies sex ratio at birth bias outcomes. The disproportionality effect allows re-evaluating SRB trends and policy responses, for instance the proposed role of the diffusion of sex selection technologies offsetting changes in gender preferences to explain increasing SRB trends in India. We propose to use prenatal sex selection propensity (proportion of couples at risk to sex select), instead of sex ratio at birth bias, as a more robust measure of sex selection. We apply our findings to India and show that sex selection propensity and prevalence in Punjab and Delhi was lower than in Rajasthan or Uttar Pradesh, despite significantly higher SRB bias in the former.

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Drastic changes in fertility level and timing in response to marriage and fertility policies. Evidence from Shandong province, China

Cuiling Zhang[1] & Tomas Sobotka[2]; [1]CPDRC/VID, [2]IIASA, VID

Policies regulating fertility and marriage in China are often localised, with regions specifying rules pertaining to the timing, spacing, and level of fertility. We use the 120- counties population dynamics monitoring system to investigate the effects of changes in fertility and marriage policies on fertility level and timing in Shandong province in China, which experienced frequent policy changes. We derive detailed fertility indicators by birth order in 1986-2015 and combine period and cohort data to gain insights about both short-term and long-term fertility responses to policy restrictions and their revisions. We look especially at first and second births, which make up about 90% of the overall fertility, and document massive shifts in fertility timing and in the age profile of childbearing following the strict enforcement of mandatory age at marriage and second birth since 1990. The enforcement of marriage and fertility timing policies since 1990 brought about a massive postponement of both first and second births and lengthening of the second birth interval, leading to a temporary sharp fall in period TFR to extremely low levels in the mid-1990s. The birth timing policies also led to a strong concentration of childbearing into a narrow age interval just after the mandatory minimum ages at first and second birth. Later, policy relaxations resulted in period fertility upswings. Cohort fertility rates and parity progression ratios were much less affected, suggesting that the main effect on birth and marriage timing policies was in fuelling instability in period fertility rates during the 1990s and 2000s.

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Determinants of fertility trends and their measurement – Tuesday 11 September 11.00am

Contrasts in fertility timing in post-Soviet countries: Do differences in religion matter?

Konstantin Kazenin[1], Vladimir Kozlov[2]; [1]National Russian Academy for National Economy and Public Administration (Moscow), [2]Research Institute-Higher School of Economics (Moscow)

An increase of fertility took place in almost all post-Soviet countries in the recent 10-15 years. However, those countries differed rather sharply in fertility timing trends during the increase. In some countries, proportion of the input of elder ages (25+) in TFR has grown, whereas in others no significant shift towards elder fertility was witnessed and the proportion of age groups 15-19 and 20-24 in total fertility remained at least as high as 10-15 years ago. Using different data sources, we demonstrate that the input of the elder ages is not growing almost exclusively in those post-Soviet countries where Muslim population is the majority. We adduce two kinds of additional evidence for relevance of Islam/Christian distinction for the timing trends. First, we consider fertility timing among a large Christian minority in a post-Soviet country where Muslim population is the majority (ethnic Russians in Kazakhstan) and in a large Muslim minority in a post-Soviet country where Christian population is the majority (indigenous peoples of North Caucasus, Russia). We show that the two minorities follow their co-believers in other post-Soviet countries rather than the country of residence in timing trends. Second, we consider our own survey data from an area of southern Russia inhabited predominantly by Muslims, which point to a significant negative relation of personal religiosity of a woman and her age at first birth. We propose some directions for further research of the fertility timing contrasts in former Soviet countries and of mechanisms possibly underlying those contrasts.

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Why the TFR of the foreign population is so misleading: how a better fertility measure can be developed knowing fertility at immigration, emigration and naturalisation in addition to births

Marion Burkimsher[1] & Philippe Wanner[2], [1] University of Lausanne, [2]University of Geneva

The fertility of non-natives is of interest not just to demographers but also to politicians and the general public. What is not commonly appreciated is that the standard calculation method of the TFR gives a highly misleading impression of the ultimate fertility of the foreign population. Switzerland's rich data sets help elucidate how this distortion happens. Switzerland has a high proportion of foreigners; in 2016, 39% of women in their early 30s were foreign. In that year the TFR of foreigners was 1.91 compared to 1.42 for Swiss women. However, both the household registration data and the Family and Generations Survey indicate that, by their 40s, foreign women have fewer children than Swiss women. Information on the fertility of women (by age) in the year they immigrate, emigrate or naturalise is also available from the Swiss household registration statistics. Applying these rates to the data on numbers of women immigrating, emigrating and naturalising going back to 1981 we calculate the expected fertility of women by age in 2016. These match well with their observed fertility (Swiss and foreign). The life course of migrants tends to be: childlessness pre-migration; migration in their 20s followed by partnering and starting a family; in their 30s and 40s, emigration of the childless or naturalisation of those with children. All these stages impact the foreign/Swiss TFR.

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Approaches to subnational European fertility

Nicholas Campisi, University of St Andrews

Ecological fertility researchers often utilize subnational aggregate statistics, such as the NUTS regions in Europe, that are readily supplied by statistics offices like Eurostat. The NUTS 2 level is commonly used in European analysis but is not the smallest area offered in the Eurostat database. I show that the NUTS 3 level may be necessary, especially in cross country comparisons, since this smaller level better captures regional patterns and variation. I aim to determine if there is statistical justification for analysis on the more descriptive NUTS 3 level that is often overlooked. I fit a simultaneous autoregressive model to total fertility rates (TFRs) for NUTS 3 regions of eleven countries spread throughout Europe. Regional patterns persist after including other regional factors, population density, urban-rural status, and regional GDP and contextual factors, NUTS 0, 1, and 2 fertility rates. NUTS 3 TFR data comes directly from respective national statistics offices for the countries while other NUTS 3 and NUTS 2 level data comes from the Eurostat database. Preliminary results demonstrate influence of subnational levels to the same degree of the national level. Results from the simultaneous autoregressive models suggest pervasive sub-NUTS 2 level variation after accounting for spatial and covariate factors. Countries with large NUTS 2 regions and many NUTS 3 regions show a larger amount of regional variation than those with fewer and larger sub-regions.

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Men and women's fertility: stability and change over time in the UK

Jenny Chanfreau & Wendy Sigle, LSE

The reduction in average completed family size and rise in childlessness over recent decades has been well documented in the demographic literature. While much research on fertility relies on data on women only, research that has included a focus on men shows gender differences, with some suggestion that patterns of change over time may also differ. The objective of this paper is to build on existing analyses of differences in completed family size by education, to help unpack how family change relates at the macro level to changing educational composition of the population, and investigate whether fertility has become more socially polarised. Using retrospective fertility histories from UK survey data, the analysis draws on the concentration of reproduction approach outlined by Shkolnikov et al (2007) and asks if and how the concentration of fertility has changed over time among women and among men. Preliminary findings suggest that despite childlessness increasing among both men and women across cohorts the concentration of fertility has remained relatively

stable, especially among men. By looking at both men and women's fertility in combination with the social polarisation thesis, the analysis shifts the attention from the conventional questions of what personal characteristics predict fertility levels towards consideration of the social division of labour in reproducing the population.

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Fertility determinants in high-income settings – Tuesday 11 September 1.30pm

Proximity to kin and second births in urban and rural areas of Andalusia, Spain

Elspeth Graham1, , Albert Sabater[1], Francisco J. Viciana-Fernandez[2], Diego Ramiro-Farinas[3]; [1]Department of Geography and Sustainable Development & ESRC Centre for Population Change, University of St Andrews, [2]Institute of Statistics and Cartography of Andalusia, [3]Spanish National Research Council

Residential proximity to kin is a key structural characteristic that appears to have a pro-natal influence on women's fertility, although evidence from urban and rural areas in low-fertility countries with a familistic tradition is still lacking. In this paper, we use a 10-year follow-up study starting around 2001 with geo-referenced data from the Longitudinal Database of the Andalusian Population to investigate whether Spanish women in urban and rural areas in the low-fertility setting of Andalusia are more likely to have a second child if they lived in close proximity to parents/in-law and/or siblings. The analytical sample consists of 42,381 primiparous women. Given the hierarchical structure of the data - individuals living in urban and rural municipalities within the province - we fit a mixed effect survival model to analyse the risk of having a second birth, with a random intercept and Weibull distribution, adjusted for individual and household fixed effects. Our results suggest that the occurrence of a second birth is positively associated with living close to kin, particularly to parents/in-laws and, to a lesser extent, to siblings, in both urban and rural areas. However, this relationship is particularly strong among women with only compulsory education in urban areas where kin support may act as a substitute for expensive childcare. Since raising children tends to involve greater expense in urban compared to rural areas, our findings demonstrate the key importance of residential proximity to kin for second births in urban areas, particularly for women with low educational attainment.

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Employment uncertainty and fertility: a meta-analysis of European research findings

Giammarco Alderotti, Daniele Vignoli & Michela Baccini; University of Florence

The relationship between employment uncertainty and fertility has always been an important topic in demographic research. However, the interplay between employment uncertainty and fertility is far from clear. Uncertainty is usually deemed to negatively affect fertility, although different associations are advocated by sociological theories and supported by micro-level evidence, albeit that it is fragmented and sometimes contradictory. We believe that before conducting another (comparative) micro-level study, there is need to get a more comprehensive understanding of the findings obtained by existing research. To this end, we perform a meta-analysis (i.e., a quantitative literature review) in order to synthesize the evidence coming from the existing literature and to draw general conclusions about the size and the direction of the impact of employment uncertainty on fertility. Articles were collected systematically, applying inclusion criteria to decide which ones to include in our sample. We measure employment uncertainty mainly (but not only) through limited-time contracts. We considered only micro-level studies and we limited the search to Europe to make the analyses more comparable. Results show that precarious employment has a negative effect on fertility (OR: 0.91, highly significant), but such effect changes significantly depend on gender, welfare state, parity, and some characteristics of the studies. The final step of our work will be comparing limited-time employment with other measure of employment uncertainty (i.e., part-time employment and unemployment) by using a network meta-analysis, namely a meta-analysis that allows multiple treatments at the same time.

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The role of biomedical factors in explaining fertility differences by education
Nitzan Peri-Rotem, University of Exeter

Previous studies have shown that various lifestyle factors, including smoking and obesity, can lead to reduced fecundity and extended time to pregnancy, partly due to their association with abnormal testosterone levels among men and women. In addition, these lifestyle factors vary markedly by socioeconomic status and particularly by education, as better educated individuals are less likely to smoke or to be overweight compared to their lower educated peers. Nevertheless, the role of lifestyle factors in explaining educational differences in fertility patterns remains unclear. Therefore, this study combines social and biological data from Understanding Society waves 1-7 and the biomarker dataset in order to estimate the likelihood of couples in reproductive ages to experience (additional) childbirth within six years. For this purpose, a discrete-time hazard model is employed, where the odds of experiencing childbirth at a given month are analysed as a function of biomedical (BMI, testosterone levels) and behavioural (smoking status) factors, alongside educational attainment, fertility intentions and other socio-demographic predictors. Initial findings show that increased female testosterone levels are linked with lower likelihood of experiencing childbirth, although no significant relationship was found between male biomedical indicators and childbearing. In addition, after controlling for female biomedical factors, highly educated women show a higher likelihood of experiencing childbirth compared to less educated ones. Thus, when biomedical indicators are held constant, the importance of socioeconomic factors in achieving fertility aspirations becomes more pronounced. Future research on fertility patterns would therefore benefit from taking both social and biomedical factors into account.

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Self-employment and fertility intentions in Europe
Berkay Ozcan, Antonella Bancalari, LSE

The relationship between self-employment and fertility is not well understood. Cross-country studies showed a negative association between self-employment rates and fertility rates in advance economies. Micro-level analyses suggested a positive association between being self-employed and fertility. We propose that part of the inconsistency is due to the heterogeneity of the self-employed. We analyse the relationship between three different types of self-employment (i.e. Entrepreneur, Labourer and Professional) and fertility intentions of individuals using micro data from the European Social Survey (ESS) covering more than 20 European countries. We use mixed-effects models that incorporate individual and country-specific factors to bridge the gap between previous macro and micro-level studies. We run separate analyses by gender and parity (i.e. intentions for the first child versus subsequent children). We find that men who belong to the entrepreneur or labourer type of self-employment have a higher likelihood of reporting positive intentions to become a father than similar wage earners. Only the labourer type of self-employed women have a higher likelihood of reporting positive fertility intentions compared to wage-earner women. Self-employment type is not associated with subsequent births. Our associations are robust to various controls at the individual and country levels (i.e. family policies) and the fixed effects specifications. We provide additional analyses to test various mechanisms related to flexibility and resources using measures of relative earnings and relative hours of work of each partner.

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Gender and Fertility – Tuesday 11 September 4.45pm

How does a couple's division of household labour affect their fertility intentions and outcomes? A review of the current literature

Alyce Raybould and Rebecca Sear, London School of Hygiene & Tropical Medicine

According to McDonald's 'theory of gender equality' (McDonald, 2000a, 2000b), lowest fertility in high-income settings is expected amongst those facing conflict between their paid and unpaid labour responsibilities. This paper is a systematic literature review of all current quantitative and qualitative research in this setting. The search yielded 25 papers regarding fertility intentions, 22 on fertility outcomes, 3 analysing both and 3 on intentions and subsequent outcomes. The papers covered the USA, Europe, the Far East and Australia. Given that 9 of these 53 papers have been published in 2017 alone, the evident growth of interest in this topic provides incentive to evaluate these papers collectively for the first time. Overall, the evidence supports McDonald's hypothesis: the majority of studies found that women and men who have less work-family conflict intended to have, and had, more children. A quarter of the papers, however, reported a U shaped association with both traditional and egalitarian couples intending and having more children. Furthermore, a group of studies highlighted that it is not always the share of domestic work between partners that is significant, but the excessive domestic burden experienced by women that dictates fertility intentions and outcomes. This suggests that it is not egalitarianism in itself that encourages childbearing, but the satisfaction for women of not experiencing a work-family 'time bind'. The review concludes that moving forward, data collectors should strive to make surveys exploring childbearing behaviour more comparable across high-income settings. Furthermore, analysts should minimise researcher's degrees of freedom so that findings are more comparable between studies.

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Son preference and female participation in household decision making

Rashid Javed and Mazhar Mughal, University of Pau

Son preference is common in many Asian countries. Though a growing body of literature examines the drivers and socioeconomic impacts of this phenomenon in China and India, work on other Asian countries is scarce. This study uses a nationally representative survey of over 13 thousand households from Pakistan (PDHS 2012-13) to analyze the effects of observed preference for sons on women's participation in intra-household decision-making. Four key intra-household decisions are considered: decisions regarding healthcare, family visits, large household purchases and spending husband's income. These correspond to four categories of household decisions, namely healthcare, social, consumption and financial. Probit and Ordered Probit models are employed as the main estimation techniques besides a number of matching routines to account for the possibility of potential selection bias. We find that women with at least one son have more say in household decisions. Bearing at least one son is associated with 5%, 7% and 5% higher say in decisions involving healthcare, social and consumption matters respectively. Women's role in financial affairs, however, does not differ significantly from women with no sons. Female participation in decision-making grows significantly with the number of sons but only up to the third parity. These results are particularly visible among younger, wealthier and educated women, and those who got married earlier. The findings suggest a limited improvement in women's bargaining power at home resulting from the birth of one or more sons. This in part explains higher desire for sons expressed by women compared to men in household surveys.

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Micro-level gender inequality and fertility in ten European countries

Beata Osiewalska, Cracow University of Economics

This study aims to investigate the relationship between couples' reproductive behaviour and multidimensional gender inequalities between partners in different country-specific contexts. The effect of the inequality in partners' educational levels, ages, as well as paid and unpaid household labour is examined. The first wave of Generations and Gender data for ten European countries are used. The average number of children and the probability of childbearing are both considered under the hurdle Poisson model. The general picture that emerges from the analysis is that the male advantage in gender inequality (induced by higher educational level, being older and doing less housework than the female partner) correlates with early childbearing and positively influences the number of children that couples at reproductive age have across Europe. Female advantage in gender inequality is associated with late childbearing, but only in Northern and Western Europe. For older couples who have completed reproduction, gender inequality in favour of the male partner is associated with a higher probability of parenthood in Central and Eastern Europe and France; it also correlates with higher completed fertility in selected CEE countries. Female advantage in gender inequality negatively correlates with the probability of parenthood across Europe. Finally, in NWE, gender-equal couples have a similar number of children to traditional unions (gender-unequal in favour of the male partner), whereas in CEE, equality correlates with lower fertility than male advantage in gender inequality. This disparity is likely connected to different levels of gender equality and various family policies in the two regions.

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Couples' labour market preconditions to parenthood in Belgium: the importance of gender

Leen Marynissen, Karel Neels, Sarah Van de Velde, University of Antwerp

The past few decades have been characterised by increasing female educational attainment and female labour market participation, bringing along decreasing gender differences in the public sphere. In contrast, gender role differences persist in the private domain. This raises questions whether labour market preconditions to parenthood have changed or remain traditionally gendered. Although available research supports the statement that financial resources, time and certainty about future labour market positions are preconditions to parenthood, most research only examines women. Less is known about whether these requirements are fulfilled through men's or women's economic positions. Hence, this paper examines the effect of women's labour market characteristics relative to those of their partners on the transition to parenthood in Belgium. Using data from a Belgian Administrative Socio-Demographic Panel (1999-2010), which contains detailed quarterly information on labour market and income positions for women and their household members, we estimate discrete-time hazard models of conceptions leading to a first birth. Results show that when the female partner works more hours than the male partner, the odds of having a first birth are lower than for couples where both partners have equal working hours. The odds are lower when the female partner earns less than 25% of the household income compared to equal income couples. Lastly, a higher female employment intensity positively affects the transition to parenthood. These findings suggest gendered effects of couples' labour market positions on the transition to parenthood.

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Sexual and Reproductive health 2 – Wednesday 12 September 11.30am

Inequalities in expenditure on maternal care in Bangladesh: do voucher schemes improve inequality?

Mark Amos[1], Aazia Hossain[2], Shehrin Shaila Mahmood[2], Mohammed Nahid Mia[2], Mohammed Shohel Rana[2], Mohammed Kashem Iqbal[2], Asiful Haider Chowdrey[2], Manzoor Ahmed Hanifi[2], William Stones[3], Saseendran Pallikadavath[1]; [1]Portsmouth Brawajaya Centre for Global Health, Population and Policy, [2]ICDDR,b Bangladesh, [3]University of Malawi College of Medicine and St George's, University of London

Demand side financing schemes such as the Bangladesh Maternal Health Voucher Scheme (MHVS) are designed to improve utilisation of maternal health services by providing cash transfers conditional on care utilisation. Vouchers provide a financial reimbursement targeted at the poorest mothers, since budgetary constraints as most likely to affect the poorest women, the most dramatic effect in terms of healthcare spending should be seen among women of low socio-economic status. This paper tests this hypothesis, examining the effect of voucher receipt on both the likelihood of making any expenditure and the level of expenditure. We find that voucher receipt significantly raises the level of expenditure for ANC and delivery stages of the continuum of care, but has no effect on the probability of making any expenditure. Further, there is no evidence that voucher receipt increases expenditure for the poorest women in particular. While demand side financing in successful in increasing access to maternal health services, it is not currently achieving its stated aim in the Bangladeshi context of increasing expenditure among the poorest.

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The cascade of intervention: Epidural pain management and the association between labour induction and caesarean section in the United Kingdom

Sarah Carter, Amos Channon & Ann Berrington, University of Southampton

Labour induction and caesarean section are childbirth interventions experienced by a growing number of women globally each year. These two medical procedures are often linked in maternal health literature through the cascade of interventions, an intervention pathway defined by labour induction at the start of birth and operative delivery at the end. While maternal indicators of labour induction are well documented in countries like the United States, considerably less research has been done into which women have a higher likelihood of labour induction in the United Kingdom, how risk of labour induction is associated with operative delivery, and whether epidural anaesthesia mediates the relationship between labour induction and delivery type. This paper investigates the link between labour induction, epidural, and type of delivery in the UK, using multinomial logistic regression and KHB mediation analysis to examine these associations in the Millennium Cohort Study. Analyses determined that induced women were more likely to experience operative delivery, and that this relationship was mediated by epidural anaesthesia. Additionally, maternal height moderated the associations between labour induction, epidural, and delivery type, such that women between 1.60 and 1.69 metres tall were more at risk of operative delivery after labour induction and epidural than women at shorter or taller heights. Determining which women are more likely to experience labour induction and operative delivery in the UK can allow women to make more informed choices about their health care and can help support efforts to provide women with individualized, patient-centred care during their labours and births.

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Access to contraceptives in Argentina and Brazil: political strategies and compared health systems

Evangelina Martich, Universidade Federal Fluminense, Brazil

Argentina and Brazil implemented strategies to promote the access to medicines in general and National Sexual and Reproductive Health Programs (with focus in promoting the access to contraceptives). Nevertheless both countries still need to strengthen the mechanism to address this problem. The main objective of this research is to understand how two different (in terms of institutional design) health systems address the problem of accessing to contraceptives, and to analyse the relationship between the medicines policy and the sexual and reproductive health in both countries in a comparative perspective. Methodology is qualitative compared public policy analyses. We review and analysis secondary sources and we made 6 semi- structured interviews with stakeholders from both countries.

The results show that the ways of access to contraceptives presents own specific characteristics and different from other essential medicines and there are differences among this 2 countries. We identified 6 key elements in the creations of that ways of access: 1)the influence of the political process; 2) the relation among the ways of access and the institutional design of the health system; 3) The participation of new actors (outsiders from the sanitary sector) in the design and implementation of this strategies: 4) A feminization of the contraception: 5) the ignorance of the right to free contraception (in both countries); and 6) The decisions taken from the medicines policy influenced more than the decisions of the sexual and reproductive programs.

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Health & mortality

Strand organizer: Amos Channon (University of Southampton)

Inequalities in health & behaviours – Monday 10 September 1.30pm

Spatial variations in bowel cancer mortality by deprivation: England and Wales
Charlotte Sturley, Amy Downing, Paul Norman, Michelle Morris; University of Leeds

Bowel cancer is the fourth most common cancer in the UK and the second most common cause of cancer death. This study investigates variations in bowel cancer mortality in England and Wales by area deprivation and geographical location. Mortality data for 1990-2012 were obtained from the UK Data Service at local authority (LA) level. Mid-year population estimates were sourced from the Office of National Statistics. Townsend deprivation quintiles for each LA in 1991, 2001 and 2011 were appended. Age-standardised mortality rates were calculated using the 2013 European standard population. To investigate variation by area type, mortality and population data were aggregated across deprivation quintiles; annually and pooled around census years. Analysis was also undertaken by geographical area. The rates were mapped and spatial clustering analysis (Moran's I) performed. The mortality data contained 379,945 bowel cancer deaths. Results to date show a downward trend in mortality across all deprivation quintiles between 1990 and 2012. The rate of decline is similar, but not equal. The fall in mortality was most pronounced in the least deprived quintile. There has been convergence of mortality rates across deprivation quintiles during the time period. Some contradictory findings are observed whereby the results depend on the area classification used (1991, 2001 or 2011 deprivation quintiles). There is no evidence of significant clustering of mortality by LAs which may be too coarse a geography to see any clear patterns. The research will go on to explore whether area trajectories (change in relative deprivation) have an impact on mortality rates.

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Sanitation externalities, population density and child height disparities in Latin America
Antonella Bancalari, London School of Economics

Understanding disparities in child height is of interest among demographers because of the lifelong implications for health, education and economic inequality. In this paper, I assess to what extent sanitation externalities and its interaction with population density can explain child height disparities in low- and middle-income countries. Using Demographic and Health Surveys and a rich individual-level census dataset, this paper uses three complementary empirical strategies, including cross-country variation, cross-sectional variation within Latin American countries and over-time variation within Peru. The preliminary findings suggest that cross-country disparities in child height are robustly associated with differences in country-level sanitation adoption and its importance increases where people live closer together. I also find that within-country disparities in child height are associated with differences in community-level sanitation adoption in both urban and rural areas, but this depends on the quality of the sanitation solution. Such externalities are an important rationale for policy intervention.

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Trends and patterns of child stunting and the double burden of child under-nutrition in Malawi: A multilevel logistic regression analysis of the 2000 and 2015 Malawi Demographic and Health Surveys Data

Lana Chikhungu, University of Portsmouth

Child under-nutrition is a major global health challenge that is implicated in child deaths in developing countries every year and contributes to poor cognitive development. Recent estimates reveal that in Malawi 37% children are stunted, 12% are underweight and 3% are wasted. This paper used the 2000 and 2015 Malawi Demographic and Health Survey data to examine the co-existence of stunting and underweight within a child, identify children that suffer from stunting only, and

performed multilevel logistic regression on the determinants of child nutritional status in Malawi. The percentage of children that are stunted reduced from 54.1% to 37.2% in 2000 and from 37% to 26.8% in 2015. The double burden of child undernutrition was estimated at 14.5% in 2000 and 8.8% in 2015. Less than 1% (0.7% in 2000 and 0.4% in 2015) of children were found to be underweight and without other kinds of under-nutrition questioning the importance of using the underweight measure for assessing child under-nutrition in Malawi. The following factors were significantly associated with stunting and the double burden of child under-nutrition; child's age, child's sex, preceding birth interval, household wealth status, residence (rural/urban), and mother's height and weight. Child stunting and the double burden of child undernutrition declined between the two time-periods but remain high. Focusing on children affected by the double burden of under-nutrition measure may lead to more effective policy interventions to tackle child undernutrition in Malawi and other countries affected by the problem.

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Demographic and geographic determinants of physical activity: findings from a novel dataset
Francesca Pontin, Nik Lomax, Michelle Morris, Graham Clarke: University of Leeds

The British Heart Foundation report that 39% of the UK population are classified as physically inactive, which is one of the leading risk factors for global mortality. Determining the factors leading to physical inactivity is the first step to reversing sedentary behaviour. Physical inactivity is difficult to capture. However, understanding determinants of being physically active may enable us to infer characteristics of the inactive. There is a new untapped source of physical activity data in the UK from increasingly popular wearable activity trackers and tracking apps. This research uses datasets combining demographic and geographic information, with details on exercise such as step count for over half a million activity tracker and app users in the UK. The data are unique in terms of physical activity studies, with objective data spanning a 2 year period, offering new insight into habitual activity patterns. This paper explores the effect of seasonality, age, gender and postcode geography on levels of physical activity, thus helping to identify areas of activity inequality. Preliminary analysis shows some unexpected patterns, for instance a positive correlation between age and steps walked daily, contrary to existing literature where a decline in physical activity with age is usually observed. The increasing popularity of self-monitoring physical activity, due in part to technological advances in the past decade, suggests people are becoming more aware of their activity levels. Therefore this paper also focuses on the demographic and geographic determinants of those who choose to track activity, a new dimension to physical activity research.

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Health & mortality across the life course – Tuesday 11 September 9.00am

Partnership status and health: Selection or protection?
Sebastian Franke[1], Hill Kulu[2], Julia Mikolai[2]; [1]University of Munich, [2]University of St Andrews

Married individuals have better health and lower mortality than non-married people. Recent studies show that cohabiting and married individuals have similar health, and once we distinguish cohabitants from other non-married groups the health differences between partnered and non-partnered individuals become even more pronounced. The reasons for better health among partnered individuals are far from clear. Some studies argue that married and cohabiting individuals have better health and lower mortality because of the protective effects that a partnership offers; others argue that partnered people have better health and lower mortality because healthier persons are more likely to form a union and less likely to dissolve it. This study investigates health and mortality by partnership status in England and Wales and analyses the causes of mortality differentials. We use data from the British Household Panel Study and apply a simultaneous equations hazard model to explicitly control for observed and unobserved selection into partnerships. Our preliminary analysis supports significant health differences by partnership status; partnered individuals have better health than non-partnered people.

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Cohort mortality: what is so special about the people born in 1946?
Marion Burkimsher, University of Lausanne

This study focuses on adult mortality: the likelihood of dying between the ages of 15 and 60 for cohorts born 1940-1951. We use the Human Mortality Database and compare 17 western countries. We calculated the age-specific death rates (ADSRs) for each cohort at each age, including in the denominator (population) the number that had already died. Therefore, the overall likelihood of dying could be calculated as the sum of the ASDRs for the band of ages we wanted to study (15-60). Some research is in progress to investigate whether the famine in the Netherlands in the winter of 1945 has burdened the cohort born that year with higher mortality. We did see this effect. However, more noticeable was the sharp decline in mortality seen just for the cohort born in 1946 in 10 of the countries studied. These were Australia, Austria, Canada, France, Ireland, Italy, Netherlands, New Zealand, the UK and the USA. The Scandinavian countries, Spain, Portugal and Switzerland do not have the same pattern. What might explain the special 'protective' nature affecting the 1946 cohort in particular? Our hypothesis is that immediately post-war the ratio of first births to all births peaked sharply. Studies in Sweden have found that first-borns have lower mortality than higher order children. The only country data we have found so far on birth order for these years is for the USA. The correlation is strong between years in which there is a higher proportion of first births and lower adult mortality.

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Patterns and risk factors for deaths from external causes in India: Analysis of nationally representative population-based Survey
Nandita Saikia[1], [2]Moradhvaj, Jawaharlal, [3]Domantas Jasilionis, [3]Vladimir Shkolnikov; [1]International Institute for Applied Systems Analysis, Austria, [2]Jawaharlal Nehru University, [3]Max Planck Institute for Demographic Research

Background: No previous study has examined the pattern and determinants of deaths due to external causes in India. In this study, we analysed the pattern and risk factors of deaths due to external causes in India. Data and method: We analysed nationally representative data from National Family Health Survey (NFHS), 2015-2016 which covers 601,509 households in all states and union territories of India. The NFHS recorded 74,945 deaths in surveyed households, of which 90% occurred in three years prior to the survey. We calculated the age specific death rate (ASDR) for all deaths and cause specific mortality rates (CSMR) due to external causes using the Lexis diagram approach. We also calculated (crude and age standardized) overall and cause specific death rates by socio-economic characteristics of the deceased. We estimated the cause eliminated life expectancy due to external causes of death by sex. Further, we carried out cox proportional hazard model to examine the risk factors of external deaths in India. Results: External deaths contribute 10.22 percent of total deaths in India. Our analysis reveals that across all age groups, women experience a survival advantage over men, although the advantage is marginal in the age group 10-24. During adulthood (15-59), the ASDR due to external causes of death for men is substantially higher than that of women. If we eliminate external deaths as the cause of deaths, men gain 2.6 years at birth while women gain 1.5 years. The socio-economic gradient is distinct in both overall and cause-specific deaths rates. Regression analysis further demonstrates that people belonging to deprived castes, Hindu religion and poorer wealth quintile have higher relative risks of death due to external causes of deaths.
Conclusion: The share of external deaths to total deaths in India is higher than previously estimated. People belonging to the lower socio-economic strata carry the burden disproportionately.

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Health and social policy – Tuesday 11 September 1.30pm

On the effects of the financial crisis and of the composition of births by gestation and age of mother on stillbirth rates: the case of Greece
Cleon Tsimbos, Georgia Verropoulou; University of Piraeus

Scope: The aim of the study is twofold. First, to explore changes in stillbirth rates in Greece in the light of the recent economic recession. Secondly, to propose a decomposition method to distinguish changes due to differentials in the levels of stillbirth rates from variations due to the composition of births by period of gestation and by age of mother. Data: We use aggregate official vital statistics for the period 1995-2016 as well as microdata on livebirths and stillbirths registered in 2006 and during 2010-2014; the microdata used in the analysis are unpublished and have been provided by the Hellenic Statistical Authority upon special request. For the purpose of the study we also consider information on per capita GDP which is a well-known index reflecting the socioeconomic conditions of a country. Methods: We apply linear regression and lag distributed models to assess the impact of the recent financial crisis on the stillbirth rates. Furthermore, we propose a decomposition method relying on direct standardisation techniques for discerning changes in stillbirth rates observed between two points in time. Results: We found that in times of financial prosperity the relationship between economy and stillbirth rates is clearly negative and significant; on the other hand in times of economic distress the favourable financial effects on stillbirth outcomes dissipate. The application of the proposed decomposition procedure reveals that the increase in the stillbirth rates between 2006 (3.34 per 1000) and 2014 (3.82 per 1000) is attributed mainly to changes in the composition of births by age of mother and by period of gestation.

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Access to the health care sector by vulnerable populations. Evidence from Italy and France
Eleonora Trappolini, Cristina Giudici; University of Rome La Sapienza

During the last five decades, Europe has witnessed a tremendous improvement in health, but these changes remain unequally distributed among different classes and countries. The Commission on Social Determinants of Health of the WHO highlights the existence of both health inequalities and disparities in the access to the healthcare sector between and within countries due to differences in gender, age, social class and ethnicity. The onset of the economic crisis, in 2008, has further complicated this debate. Using the 2005 and 2013 waves for the Italian and the 2006 and 2014 waves for the French Health Condition Survey, the aim of this study is to analyse both health and the healthcare utilisation of the disadvantaged categories (migrants and labour force population) in Italy and France. Verifying whether the social, economic and political context could affect inequalities in health in such countries. The Italian sample focuses on 128,040 individuals in 2005 and on 119,073 in 2013; the French sample focuses on 22,150 individuals in 2006 and on 26,514 in 2014. Applying logit models, we performed separated analyses for each of the frail categories. Preliminary results have shown that foreigners (2005) in Italy declared better health than Italians; in France (2006) foreigners declared worse health than the French. Yet in the latest data there is no difference between such populations. In Italy (2005), employees, workers and unemployed had worse self-rated health than managers and directors; in 2013 this difference still persists. France in 2006 showed disparities, although less pronounced than Italy. Recently such differences levelled out.

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Interactions between healthcare access barriers: Implications for progressive universalism in LMICs
Laura Sochas, London School of Economics

Healthcare access inequalities in Low-and-Middle Income countries remain high, and interventions to remove one access barrier at a time have not always been pro-poor. While the literature is clear that jointly removing multiple access barriers is more likely to be effective in improving overall access, the impact on inequalities has not yet been theorised or empirically tested. This paper formulates the 'Interactive Barrier Hypothesis' (IBH), whereby removing a single healthcare access barrier could increase access inequalities if there are interactions between barriers: people who face fewer other barriers would benefit more from the removal of a single barrier. This study tests the IBH in the context of health facility delivery in Zambia, from 2008 to 2013, using innovative methods to measure barriers and to test for their interactions. Five access barriers are measured using geo-references to link DHS data on births to a health facility census: availability of health workers, distance to care, quality of care, affordability and stigma. An innovative multi-level approach (Evans et al, 2017), where births are nested within groups defined according to barrier combinations, enables an estimate of the overall importance of interactions in explaining the variance in health facility delivery between births. Results suggest that interactions between barriers explain around 10% of the total variance in health facility delivery. This study contributes to the policy literature on reducing inequalities of healthcare access in low-income countries by demonstrating that under certain conditions, removing one healthcare access barrier at a time may have negative consequences for equity.

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Female Genital Cutting (FGC) and child mortality: Evidence from the 1999 Senegalese FGC Ban
Jorge Garcia-Hombrados, LSE, MPIDR

This study exploits across ethnic-group variation in exposure to a law that in January 1999 banned the practice of female genital cutting (FGC) in Senegal to investigate the causal link between FGC and child mortality. The analysis shows that girls from ethnic groups that were more affected by the law experienced also had larger reductions in the probability of child mortality. The effect is particularly large in the urban sample and indistinguishable from zero in rural areas. These results, robust to different falsification tests, document for the first time the causal link between FGC and child mortality.

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Longevity and health – Wednesday 12 September 11.30am

Is the life expectancy gap for indigenous Australians narrowing? The case of the Northern Territory
Tom Wilson[1], Yuejen Zhao[2]; [1]Charles Darwin University, [2]Northern Territory Department of Health

Background: The Indigenous population of Australia is highly disadvantaged across a spectrum of demographic and socio-economic indictors, including life expectancy. Closing the wide gap between Indigenous and non-Indigenous Australians in these measures, including life expectancy, is a top political priority. Unfortunately the Indigenous population is also disadvantaged in terms of official statistics. Indigenous population estimates, which form denominators for death rates and many other indicators, are inconsistent over time and cannot be used to create reliable time series of demographic rates. Aim: The aim of this paper is to present an internally consistent dataset of population estimates and life tables for the Indigenous population of the Northern Territory over the 1966-2016 period, and to assess whether progress is being made towards reducing Indigenous inequality in life expectancy. Data and methods: A consistent time series of Northern Territory Indigenous population estimates for 1966-2016 was created by starting with the official 2016 estimates and working backwards in time using reverse cohort survival. The method made use of Indigenous deaths and internal migration data for the Northern Territory, which are deemed to be reliable and are available back to 1966. Life tables were calculated using standard abridged life table methods. Results: Results will show the extent to which Indigenous life expectancy has changed over the 50 years to 2016. It is expected that the results will be consistent with those from earlier work which demonstrated long-run improvements in Indigenous life expectancy but no narrowing of the 17 year life

expectancy gap with the Australian population as a whole. Conclusions: An enormous challenge remains in improving the health and mortality of Indigenous Australians living in the Northern Territory and other parts of remote Australia. Further work exploring cause-specific mortality would help understand this situation.

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What happened to improving longevity?
Alan Evans[1], Adrian Gallop[2], Brian Ridsdale[3]; [1]Office for National Statistics, [2]Government Actuary's Department, [3]International Actuarial Association

Since the 1950s the UK has experienced steady improvements in life expectancy at birth. In 2015, they observed a spike in deaths which brought about the first reduction in UK life expectancy estimates of the 21st century. This was first thought to be a blip in the historic trend driven by abnormally large amounts of seasonal flu deaths. However, the overall slowdown in life expectancy improvements persisted and has left mortality experts and academics debating what is causing this slowdown. Data will be sourced from the Human Mortality Database and individual countries' National Statistics Institutes. We will be looking at a selection of comparable European countries including France, Germany, Italy and Netherlands and some from around the world such as USA, Canada, Japan and Australia. These have been selected as they are similar in terms of life expectancy and levels of economic development and will give a rounded view of mortality trends in comparable countries to the UK. We will present analysis of expectations of life, age standardised and age specific mortality rates and cause of death data to identify in which countries, and to what extent, the slowing in life expectancy improvements has occurred. The data will be cut by age and sex to identify whether there are specific parts of the population or specific causes of deaths influencing the overall trends. This presentation will discuss our findings and examine common trends across countries experiencing and countries not experiencing slowing longevity improvements.

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Is it worth weighting for? Measuring health expectancies in Europe using education adjusted weights
Sonja Spitzer[1], Daniela Weber[2]; [1]Wittgenstein Centre for Demography and Global Human Capital, [2]Vienna University of Economics and Business

Life expectancy is set to continue increasing in Europe. We will live longer, but will we live healthier? This question is frequently tackled by analysing health expectancies, which capture the number of years a person can expect to live in good health. These measures usually combine mortality data from censuses with prevalence rates of good health from surveys. Yet the education distribution of survey participants is rarely the same as the distribution in the actual population, which is crucial given the strong correlation between education and health. We analyse if and how health expectancies differ when the actual education structure in the population is considered. For this purpose, two sets of post-stratification weights are computed, one of which is adjusted for education. Results based on both sets of weights are then compared. The analysis relies on survey data provided by SHARE (Survey of Health, Ageing and Retirement in Europe) as well as census data for 16 European countries from 2011. Health expectancies are calculated using the prevalence information from the survey data and Eurostat life tables applying Sullivan's method. Calculations are done separately by country, sex, and five-year age group starting at age 50. Preliminary results show that prevalence rates vary depending on how much the education structure in the survey differs from the education structure in the population. Yet when calculating health expectancies, deviations are minor.

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Historical demography

Strand organizer: Hannaliis Jaadla (University of Cambridge)

Fertility in the past: A global perspective – Tuesday 11 September 11.00am

Descendants over half a millennium: marital fertility in four Zhejiang lineages, 1400–1900
Sijie Hu , Department of Economic History, London School of Economics and Political Science

This paper studies marital fertility of four Chinese lineages in Zhejiang Province from 1400 to 1900. The paper mainly deals with three research questions: how high exactly was Chinese marital fertility from 1400 to 1900? Was it stable over time? Was it a 'natural fertility' regime or did the Chinese control fertility within marriage? By exploiting new genealogical data of 500 years of detailed records on individual births, deaths, and marriages, and studying more than 20,000 individuals in the four lineages, a unique marital fertility pattern is reconstructed and re-examined. The measures used in this paper to estimate marital fertility levels consist of both standard fertility measures relative to females, age-specific marital fertility rates and total marital fertility rates, and also a non-standard fertility measure relative to males, namely net fertility of married males. The paper also runs a new test to examine the existence of the early stopping behaviour in marriages, a type of parity-dependent control. On the one hand, contrary to conventional wisdom on Chinese fertility, the results show that the marital fertility rates in the period were much lower compared to those of Northwest Europe in similar periods. On the other hand, in line with the classic ideas, the paper finds no signs of parity-dependent controls within marriages, which suggests that Imperial China was still largely a "natural fertility" regime.

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Two views of fertility decline in England and Wales from 1851 to 1911
Eilidh Garrett[1], Hanna Jaadla[2], Alice Reid[2]; [1]University of Essex, [2]University of Cambridge

The 1911 Census of England and Wales included questions for married women on the fertility of their current marriage. This retrospective survey formed the basis of an extensive report which has been the subject of considerable scrutiny and debate. Without access to the individual answers of the women who responded, however, scholars have been unable to fully examine and evaluate the conclusions reached. With the release of the Integrated Census Microdata (ICEM), a machine readable database containing transcriptions of the census enumerators' books from the censuses of 1851–1911, it is now possible to reconsider the path of fertility decline in England and Wales and to assess whether the retrospective responses of women surviving to 1911 captured the complete picture of the move towards smaller family sizes. We can, for example, investigate whether in-migrants influenced nuptiality or fertility patterns in Victorian England and Wales. The paper will compare the answers given to the Fertility Census questions by married, spouse present women in different age and marital duration groups in 1911 against fertility measures derived from more conventional data from this, and previous, censuses. A version of the Own Child Method, identifying children aged under 5, living with both of their parents on census night, is used. By comparing the two sets of measures we will provide both a more nuanced understanding of the origins of the fertility decline in England and Wales and an assessment of the relative merits of a 'snap shot' and 'retrospective' measures of fertility behaviour.

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Stopping, spacing and postponing in the British fertility transition: insights from the historic census data
Alice Reid[1], Hannaliis Jaadla[1], Eilidh Garrett[2], Kevin Schürer[3], Ian Timaeus[4]; [1]University of Cambridge, [2]University of Essex, [3]University of Leicester, [4]London School of Hygiene & Tropical Medicine

The traditional story about fertility decline during the demographic transition is that of a move from natural, 'uncontrolled' fertility to a regime where couples embark on childbearing soon after marriage and stop once they reach a desired or 'target' number of children. In this paper we use complete count individual level census data for England and Wales for 1911 to examine whether the initial stages of the British fertility transition fit this pattern. The 1911 census asked married women how many children they had given birth to in their current marriage, how many of those children were still alive and how many had died, as well as asking for the duration of their marriage. We use a method originally suggested by Luther and Cho (1988) to impute the ages of dead and absent children and therefore reconstruct full birth histories. We use these to produce parity progression ratios and the length of closed birth intervals by parity, producing estimates for social groups and types of place in the 17 years leading up to 1911. Results indicate roughly parallel reductions in parity progression across all parities, and little evidence for the emergence of a parity-specific stopping behaviour or a specific family size norm during the early stages of the first demographic transition in England and Wales. The implications for theories of fertility control will be discussed.

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Mortality and health in historical populations – Tuesday 11 September 4.45pm

Death before birth in Italy: Reconstructing long-term trends and geographical patterns
Lucia Pozzi, Marco Breschi; University of Sassari

While considerable research has been dedicated to the analysis of infant and child mortality in the past, stillbirths have received little attention in the Italian literature. This paper aims to fill, at least in part, this gap concerning an important component of the mortality experience. In the first section of our paper after discussing the complex problems of the classification of stillbirths and recording procedures, in the light of the Italian legislation, we analyse the quality of the statistical sources, documenting the progressive process of registration improvement, which has been especially geographically differentiated. Then we reconstruct, for the years 1863–1980, the trends in stillbirth rates at the national and regional level, focusing on the north-south gradient emerging since the beginning of the 20th century. Furthermore, we investigate the distribution of foetal deaths by gender in the long run, while other aspects, such as seasonality or interactions with neonatal mortality are analysed for more limited periods, according to the available sources. This analysis allows us to document the relevance of the improvement in the quality of birth attendance in reducing the number of intrapartum deaths as well as to emphasize the diversified process of health intervention, and childbirth hospitalization, in the Italian regions. Finally, we would like to provide some elements of reflection on the potential role of two other fundamental sets of factors, according to the literature: maternal health conditions before and during pregnancy (nutritional status in particular and its effect on birth weight) and the prevailing disease environment.

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Infant feeding and cohort health: Evidence from the London Foundling Hospital

Vellore Arthi[1], Eric Schneider[2]; [1]University of Essex, [2]London School of Economics

What was the relationship between breastfeeding and cohort health in the past? We examine this question using a rich new source of longitudinal data on nearly 1,000 children from London's Foundling Hospital (1892–1919). Specifically, we test the association between the feeding regime in infancy and subsequent health, as manifested in mortality risk and anthropometric growth at later points in childhood and adolescence. We find that breastfeeding was positively associated with both survival and weight-for-age in infancy, with scarring dominating culling on net. However, infant-weight gradients in catch-up growth ensured that by mid childhood, these initial feeding-related health differentials had disappeared.

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Infant and child mortality by socioeconomic status in early 19th century England

Hanna Jaadla, Ellen Potter, Romola Davenport; University of Cambridge

The relationship between socioeconomic status and mortality has proved very difficult to study in English historical populations, due to a lack of status indicators in available sources especially before c.1850. Here we use the paternal occupational descriptors routinely recorded in the Anglican baptism registers from 1813–1837 to compare child (under 5s) mortality by social status in family reconstitution samples from 8 parishes. Paternal occupations were ranked by the propensity for their movable wealth to be inventoried upon death (a measure of wealth), and survival was analysed using event history models. When data for the eight parishes were pooled, wealth conferred no survival advantage in infancy. Wealth was associated with higher survival rates in early childhood, except in the case of labourers, who were among the poorest of fathers but whose children enjoyed relatively high survival chances. We relate these findings to patterns of birth intervals and differences between individual parishes, and to the effects of parental literacy (as indicated by the ability to sign the marriage register).

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Do historical expenditures on water supply and sewerage correlate with mortality outcomes? New evidence from British cities, 1870–1911

R. J. Davenport, T. Aidt, F. Gray; University of Cambridge

Water purification and sewerage are widely regarded as key elements underpinning modern gains in life expectancy. However the empirical evidence regarding the effects of these types of public health interventions on mortality and morbidity is often equivocal. Recent meta-analyses in contemporary populations have repeatedly revealed only modest effects of interventions to provide clean water sources (as opposed to point-of-use treatments), with very large differences between studies. This variation is observed in comparative historical studies as well. In the English case, improvements in water and sanitation, as measured by public expenditure, bear a contested relationship to mortality improvements. Previous English studies have relied on loans contracted by urban authorities, and on decennial mortality rates, and these referred to different geographical units (urban sanitary districts, and registration districts respectively). In contrast, our study uses data on expenditure, rather than loans, and high frequency weekly mortality rates reported for the largest urban sanitary districts. Although mortality from cholera, dysentery and typhoid was dramatically reduced by improvements in water supplies in the period c.1850–1900, the timing of these falls was poorly correlated with expenditure. Infant diarrhoeal mortality failed to respond to water and sanitary interventions until the early twentieth century. We explore the relationships between meteorological variables and infant and diarrhoeal mortality to test whether insect vectors could have played a significant role in transmission of diarrhoeal diseases, and why this relationship may have changed after c.1900. We offer an evolutionary biological explanation for the chronology of declines in gastrointestinal diseases.

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Innovative data, methods & models

Strand organizer: Jason Hilton (University of Southampton)

Innovation in data collection & processing – Tuesday 11 September 9.00am

Dispersal and data: methods for analysing asylum seekers and refugees in the UK
Sarah Nurse, Jakub Bijak; University of Southampton

The limited availability of data is a key challenge faced by those researching asylum seeking and refugee populations in the UK. In particular, analysing the dispersal policy, where asylum seekers requiring support are housed with no element of choice of location, is difficult with so few data sources. In this context, combining datasets that do not report dispersal status with those that do has the potential to open up a new range of variables and topics to be explored. The main research question addressed here is: how can combining datasets on asylum seeker and refugee populations help us further understand dispersal? Through an assessment of the additional information gains and the errors of estimation that are introduced, the feasibility of methods for combining data is explored. Three possible options for combining sources are considered: individual data linkage is presented with a discussion of the potential for analysis of a resulting dataset, an illustration of how information on individuals can be 'borrowed' shows how successfully dispersal status can be predicted and finally a method that utilises cell structures to combine information on aggregates and allows further analysis of social and economic outcomes is presented. Results show that augmenting the Annual Population Survey by predicting probability of dispersal, using model coefficients based on data from the Survey of New Refugees, can effectively add an indicator of dispersal to the existing source. Finally recommendations for how additional, targeted data collection could facilitate a more effective application of these methods are offered.

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A longitudinal approach to investigate European migration to the UK using the Facebook Advertising Platform
Francesco Rampazzo[1], Jakub Bijak, Agnese Vitali[2], Ingmar Weber[3], Emilio Zagheni[4]; [1]University of Southampton and Max Planck Institute for Demographic Research, [2]University of Southampton, [3]Qatar Computing Research Institute, [4]University of Washington and Max Planck Institute for Demographic Research

International migration to the UK has become a hot topic both in research and in the media. Nevertheless, a huge limitation of this topic of research is the availability of data for measuring migration. Raymer and Willekens (2008), Poulain, Perrin and Singleton (2006), Bijak (2013) and Abel and Sander (2014) address the issue of improving existing statistics on international migration from a definition perspective, but also through statistical modelling. Detailed data on migrants' characteristics are much needed for producing accurate statistics and informing policy. We want to use online advertising data to provide a clearer picture of these migrants. This paper has two aims. First, it aims to create the first longitudinal geo-located dataset from Facebook's Advertising Platform through a weekly collection from mid-December 2017 onwards for two years. Secondly, it aims to give a weekly picture of immigration from the EU following the EU referendum. The dataset will be stratified by characteristics such as age, gender, country of origin, education level, and employment field. The analysis will complement traditional data sources provided by the ONS, with which we will compare with our estimates. Then, a time series analysis approach will be used to analyse the data. It will be important to observe the differences by country regarding the trends, cycles, and seasonal changes in the data. With this approach, it will be possible to make projections of future trends in migration using Facebook data. The preliminary results from Facebook show proportions close to the ONS estimates for 2016.

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Creating a spatially-detailed synthetic population micro-dataset
Paul Williamson, University of Liverpool

An increasingly wide range of researchers find themselves requiring realistic population microdata as inputs to their various modelling approaches. These include those engaged in dynamic microsimulation, agent based modelling and transport modelling. A now standard way of attempting to address this problem is to calibrate a population survey to a known set of local area benchmark constraints. Two particular challenges stand out. First, constructing synthetic populations of individuals nested within households that optimally satisfy both local person-level and household-level estimation constraints. Second, the creation of synthetic populations that are integer- rather than real-weighted. This paper outlines a novel technique, 'Global Optimisation' (GO) that addresses these challenges. GO provides solutions that are 'globally optimal' in the sense that they maximise the possible fit to the local area benchmarks; and that are integer-weighted without introducing rounding bias. The results section of this paper presents the strengths and weaknesses of this approach, comparing it to the three main alternative approaches currently in use (Iterative Proportional Fitting (IPF); Generalised Regression (GREG) and Combinatorial Optimisation (CO). Each approach is evaluated in terms of its ability to fit local area benchmarks; and to estimate the known (but not benchmarked) distribution of age by sex by health. Finally the paper presents results demonstrating other aspects of GO, including its sensitivity to the size of the survey being calibrated and the spatial scale for which survey estimates are required. Lessons are drawn from this to the relevance of the approach for adjusting the Census for under- and over-count.

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Changing administrative sources in an Admin Data Census: measuring the risks, benefits and opportunities
Louise O'Leary, Bethany Fitzgibbon; Office for National Statistics

Reliance on any administrative data source to provide information about the size of population, characteristics of the population or households and families carries risk. A changing political climate, including Brexit, or a change in government and any resulting policy changes may impact the operational system used to collect the data, the stability of definitions (for example tax thresholds) or the frequency and timing of when the data is available, as well as the appetite to share these data. These all have an impact on the quality of the data available to researchers. Using case studies (including health, tax and benefits data), this paper seeks to explore how planned and unplanned changes to administrative systems impact the ability of the Integrated Data Division in ONS to produce reliable estimates of the population (both size and characteristics). It also assesses how we can begin to understand, quality assure and measure uncertainty around the impact of external changes to systems and what steps can be taken to minimise these. In conclusion, the Integrated Data Division at ONS is working towards a framework to understand and measure the uncertainty and challenges around using non-survey data (administrative, big and commercial) whilst also seeking to optimise the benefits and opportunities of new administrative systems to help provide new insights into society.

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Innovation in modelling & forecasting – Tuesday 11 September 1.30pm

Projecting people and households at high spatial resolution
Andrew P Smith, Nik Lomax; University of Leeds

The Infrastructure Transitions Research Consortium, a collaboration of seven UK universities, is looking at future infrastructure demand across a range of sectors (transport, water, waste, energy and digital). The consortium requires high resolution (i.e. a very fine spatial scale) projections of population and housing in order to feed their demand models. Demographic projections for both people and households are produced by statistical agencies around the world. These projections are essential for planning the delivery of services and the allocation of resources to sub-national areas but with few exceptions, projections are limited to larger administrative areas (e.g. local authorities in the UK) because the

geographical detail is not available, or is simply not required: for example national funding allocation is usually given to administrative areas, not small sub-administrative units. This paper outlines and compares two methodologies for producing consistent high resolution projections of people and households in Great Britain. Firstly a technique that uses a series of microsimulations constrained to official projections at wider geographies; secondly a dynamic microsimulation model which utilises survey and census data as well as supply data for housing stock. In both models, people are allocated to households, who are then distributed to physical housing units. In the second model, we discuss how the coupling between the time-evolution of populations and that of households can be captured.

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The shelf life of sub-national projections, from Australia to England
Ludi Simpson[1], Tom Wilson[2] (Charles Darwin University), Fiona Shalley[2]; [1]University of Manchester, [2]Charles Darwin University

Wilson et al. (2017) measured the empirical distribution of the accuracy of projected population in sub-national areas of Australia, developing the concept of 'shelf life': the projection's furthest horizon which remains within 10% inaccuracy for at least 80% of areas projected. The shelf life depended on size of area, being 9 Â½ years for areas of about 10,000 population and 13 Â½ years for areas of about 100,000 population. This paper extends the analysis to (a) report on official sub-national projections in England since 1974, and (b) take into account the user's need for projections of specific horizons for different purposes. Since local government reorganisation in 1974, 19 official projections of the population of local government areas in England have been made. By comparing the published projection with the post-census population estimates, the empirical distribution of errors will be described, dependent on horizon and population size. Users of projections tend to have in mind a horizon and a required accuracy that is of relevance to each application. A shelf life of 10 years in the sense of within 10% inaccuracy for at least 80% of areas would not be sufficient if the user required that accuracy of a forecast 15 years ahead. The relevant shelf life must deduct the user's horizon. One can expect shorter horizons to require greater accuracy. We explore the empirical performance of official English sub-national projections in this light. We propose questions about users' perceived needs that will help focus the analysis of official projection accuracy.

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Forecasting UK fertility using Bayesian Parametric Mixtures
Jason Hilton, Erengul Dodd, Jon Forster, Peter W.F. Smith; University of Southampton

Fertility is a dynamic social process that is influenced by a wide range economic and cultural factors. This complicates the process of forecasting future numbers of births, as the direction and magnitude of changes in fertility rates are consequently much less predictable than they are for mortality. The current paper presents a Bayesian approach to fertility forecasting that adapts and develops existing approaches to modelling fertility age structures with parametric mixtures. Taking cohort as the primary forecasting axis, completed family size is forecast using time series methods, and for each cohort, age specific rates are obtained by decomposition into two mixture components. Both the mixture parameter and the location and scale of the components themselves are further modelled and projected using time series methods. This approach is parsimonious and has several other advantages. Firstly, the Bayesian framework allows all sources of uncertainty to be included in predictions of future fertility. Secondly, the parameters to be forecast have potentially meaningful demographic interpretations. Model comparison methods are used to compare the efficacy of the various functional forms of the mixture components. Additionally, change-point models and approaches incorporating stochastic volatility are investigated. The final efficacy of the approach is determined through its ability to predict 'held-back' observations not used during the fitting process.

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Event history analysis of births to women in the UK using Generalised Additive Mixed Models
Joanne Ellison, Jon Forster, Erengul Dodd; Centre for Population Change, University of Southampton

Aggregate UK fertility data available at the population level can only give limited information about the patterns of variability of age-specific fertility rates. Survey data provides a rich source of information through fertility histories of individuals and their corresponding characteristics, which can help to gain a better understanding of the underlying variability of fertility rates. By modelling the fertility histories of 5,789 women surveyed in the 2006 General Household Survey, we investigate the dependence of birth events on selected covariates as well as information derived from the fertility histories themselves. Generalised Additive Mixed Models (GAMMs) allow the incorporation of covariates as smooth terms and provide a straightforward way to account for the clustering of observations within each woman through random intercepts. Fitting parity-specific GAMMs to the survey data, we learn about the variability of fertility as a function of age, cohort, education, ethnicity and birth interval. There is the potential to combine inferences from this detailed individual-level data with the coarser population-level data for the purposes of forecasting.

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Innovation in methodology – Tuesday 11 September 4.45pm

Probabilistic methods for combining internal migration data
Guy Abel[1], Guillermo Vinue Visus[2], Dilek Yildiz[3], Arkadiusz Wisniowski[4]; [1]Asian Demographic Research Institute, Shanghai University, [2]Wittgenstein Centre (IIASA, VID/OEAW, WU), [3]Vienna Institute of Demography, University of Manchester

In order to fully understand the causes and consequences of population movements, researchers and policy makers require timely and consistent data. Migration data are commonly obtained from censuses, registers or surveys. Each of these data sources can vary in their measurement of accuracy, coverage of population, undercount and definitions of a migration event. This paper proposes a Bayesian probabilistic methodology to harmonize migration data from different sources. In particular, we build a hierarchical model for combining migration data sources in the USA between 1980 and 2016. The model allows for estimates of true migration flows that explicitly compensates for the inadequacies in each data source and provides one-step ahead forecasts of bilateral migration patterns.

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Mapping road traffic crash hotspots using GIS-based methods: A case study of Muscat Governorate in the Sultanate of Oman
Amira Al Aamri[1], Graeme Hornby[2], Abdullah AL Maniri[3], Li-Chun Zhang[1], Sabu S. Padmadas[1]; [1]Department of Social Statistics and Demography & Southampton Statistical Sciences Research Institute, University of Southampton, [2]GeoData, University of Southampton, [3]Oman Medical Specialty Board, Road Safety Research Program, The Research Council, Sultan Qaboos University

Road traffic crashes (RTCs) are a major global public health problem and cause substantial burden on national economy and healthcare. There is little systematic understanding of the geography and spatial correlations of RTCs in the Middle-East region, particularly in Oman where RTCs are the leading cause of disability-adjusted life years lost. The foci of this study is to: (1) identify high density crash zones in the Muscat Governorate (2) explore the characteristics of crash hot-zone, and (3) examine the spatio-temporal patterns of RTCs in the study area. We applied an adjacency network analysis integrating GIS and data of five years (2010-2014) of RTCs in Muscat Governorate using robust estimation techniques including: Kernel Density Estimation (KDE) of both 1-D and 2-D space dimensions, Network-based Nearest Neighbour Distance (Net-NND), Network-based K-Function, Random Forest Algorithm (RF) and spatiotemporal Hot-zone analysis. The findings demonstrate evidence of spatial clustering of RTC hot-zones on long roads demarcated by intersections and roundabouts. Findings from RF algorithm and Wilcoxon tests show that hot-zones are associated with higher level of road traffic and with higher numbers of exits and entrances and shorter distance between junctions, while posted speed limits

has no significant effect in determining the crash risk on road zones. The spatio-temporal analysis provides evidence of the consistency in the positions of crash hot-zones in the study area. The results from GIS application of NRTC data are validated using the sample data generated by iMAAP database.

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Self-discovery for supervised measurement: An application to the concept of 'productive ageing'
Ginevra Floridi, London School of Economics

Quantitative social science studies often measure key concepts by combining a set of indicators into a scale. Unsupervised measurement methods use observed correlation structures to identify scales that best explain variation in the indicators, but may fail to measure the desired concept. Supervised measurement methods use expert judgements to aggregate indicators, but require explicit decisions about aggregating activities that are difficult to make and to assess. We propose a 'self-discovery' method for measurement supervision that uses the form of a conjoint experiment, with reference to the demographic concept of 'productive ageing' in Italy and South Korea. We consider older adults' participation in paid work, volunteering, grandchild care and informal care as indicators of productive ageing. We take these indicators as measured in major ageing surveys, and ask Italian and South Korean academics with a research interest in productive ageing to complete a series of pairwise comparisons on hypothetical profiles of older adults participating in different combinations of activities, and to different extents. By ranking profiles based on their level of productivity, the experts implicitly indicate the relative weights to place on each activity. We model responses on the full set of activities, revealing their relative weights. Results indicate a high level of inter-coder reliability in the definition and measurement of productive ageing. When comparing Italian and South Korean academics, we find some evidence of contextual differences in the definition of the concept, with Italian experts putting more weight on grandparental care and less on volunteering relative to their Korean counterparts.

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Statistical archaeology to retrieve Small Area Statistics from the UK 1961 Census
Justin Hayes, University of Salford

Censuses provide the statistical bedrock for current and historical demographic analysis. The 1961 Census of Great Britain was the first UK census to use electronic computing for the processing of inputs and production of outputs. This enabled the production of detailed Small Area Statistics (SAS) for areas with populations of only a few hundred households for the first time, in addition to traditional published outputs for much larger areas. Small area outputs from UK censuses from 1971 onwards are available in digital form from various online sources without restriction. Unfortunately, no digital versions of the 1961 SAS survive, but the information content of the 1961 SAS has been preserved in a set of over 140,000 digital images held by the Office for National Statistics (ONS), taken from microfilm images of the paper prints on which the SAS were originally supplied. The Pattern Recognition and Image Analysis Research Lab (PRImA - http://primaresearch.org/) at The University of Salford has collaborated with ONS on a 'statistical archaeology' project that has developed methods to retrieve and integrate digital values from the 1961 census images in order to make the 1961 SAS available in digital form for analysis using modern tools and techniques. The work has been automated as far as possible so that most values have been digitised using optical character recognition, integrated, and then validated through a series of quality assurance processes. A small proportion of values have identified as containing errors, due mainly to quality issues with some of the images, and are being corrected using an innovative crowd-sourced approach. This paper will describe the methods and processes developed to retrieve the 1961 SAS, present results and outputs to date, and discuss the potential for similar retrieval of other historical statistical data.

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Local demography and its impact on local policy

Session organizer: Piers Elias (Demographic Support)

Monday 10 September 1.30pm

Forecasting population change in a school setting
Heather Zawada, Hampshire County Council

Between 2010 and 2016, the school age population saw a growth in the numbers admitted to HCC schools that equalled the previous 12 years of decline. With birth rates continuously on the rise since 2001 until 2012 the numbers of children entering the Hampshire schools system has increased with a notable period of pressure on existing school places since 2010. The use of a forecasting model has been fundamental in predicting the localised areas particularly under pressure from this population growth, but with data indicating we have hit the peak in numbers, how does a forecasting model cope with change?

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Projecting school place demand for pupils with Special Educational Needs and Disabilities in London
Marta Lapsley, Ben Corr; Greater London Authority

Local Authorities have a duty to provide suitable school places for all children, including those who have Special Educational Needs and Disabilities (SEND). To support London's boroughs in their SEND place planning, the GLA is working to produce a projection model for SEND school place demand. Provision of SEND places is costly, on average three times more than mainstream places. It is crucial that boroughs are able to plan effectively for SEND places to ensure that some of the most vulnerable pupils are properly supported, and that the best use is made of tight resources. The demand for high-needs SEND school places in London has increased by 18 % since 2010, a much greater increase than in the rest of England where demand has increased by 4 %. There are also changing patterns in the types of SEND needs of London's pupils, which increases the complexity of the modelling process. The GLA's methodology uses a back series of data collected in the spring schools census, and projections are broken down by need type (e.g. autistic spectrum disorder, visual impairment etc) and severity. There are limitations to this data which mean that we are working closely with stakeholders in the boroughs and beyond to interpret the data and identify suitable parameters for projecting forward each need/severity. Initial results suggest that in London by 2025 the demand for high-needs SEND places will have increased for most need types, but that the total demand for SEND places will have fallen.

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Absurd population projections in Coventry & the destruction of the Green Belt
Merle Gering[1], Keith Kondakor[2], [1]Keep Our Green Belt Green Coventry and Warwickshire, [2]Nuneaton and Bedworth Council

This paper describes the collusion of ONS, consultants, Coventry Council, and the Planning Inspectorate to use unreliable population figures as justification for building on green belt. SNPP2014 projects Coventry will grow 250% above the West Midlands average, 2011-2031, but no one could tell us why this would happen. Nonetheless, none of the principals, - ONS, the consultants, Coventry Council, the planning inspectorate, nor the planning minister would consider that the projections might be seriously mistaken. Andrew Tyrie aptly said, "The ONS has fallen a long way short, lacking intellectual curiosity, prone to silly mistakes and unresponsive to the needs of consumers of its statistics". Citiizens found they were banging their heads against a brick wall, even though they presented plentiful evidence against the alleged population boom: mediocre job creation, below average birth rates, low house prices, middling population growth during 2001-2011, falling school admissions. Consultants exaggerated birth rates and depressed death rates, UPC is high. No matter. Officials, inspectors, and politicians did not want to know any of this, and the courts would not even consider the evidence. Detailed

analysis shows the excessive projections arise from over counting of foreign students - After London, Coventry has more non-EU international students than any other city in the UK. Analysis showed 3,750 students a year were wrongly padding out local growth, when HESA data showed they'd left the region. Result? Houses will cover the Green Belt, needlessly.

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Local migration and its impact – Tuesday 11 September 4.45pm

Planning health needs in new settlements
Richard Potter, Analytics Cambridge

The presentation will be to report on the planning of demand for health services for Northstowe new town. Northstowe, just north of Cambridge, is planned to be 10,000 dwellings. Construction has begun and the first residents moved in during 2017. The work carried out looked at the nearby new village of Cambourne where construction started in 1998. It comprises 4,500 houses. The factors considered were: the age of the population, language, ethnicity, types of housing and service provision at GP practice. The key aspect was how the characteristics of Cambourne compared to the surrounding area. One output from the work is forecasts of potential numbers of patients who would live in Northstowe. The presentation will include requirements that were put forward to be tested. It will discuss where these were possible and where there were difficulties in analysis. The study used data from a number of published sources: the Census of Population, Department for Education school census, NHS digital, the Post Office and South Cambridgeshire Planning Department. Anonymous data as supplied by the GP practice in Cambourne was also used. As well as discussing the ideas for health requirements explored the presentation will also look at the data sources used and their advantages and limitations. The potential application is for forecasting health needs for substantive development including sustainable urban extensions, new garden towns and villages.

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The shaping of local populations: smoothing and clustering internal migration data for England and Wales
Andrew Hind, University of Southampton & Local Authority School Planning Consultant

Research question: Local authorities require population forecasts for a range of planning purposes. Internal migration accounts for the majority of gains and losses to local populations and plays a major role in the shaping of their size and age structure. Rogers and Castro (1981) developed the concept of model migration schedules, comprising parameterised curves modelling migration at different life stages. Wilson (2010) extended this to include a student peak curv, now the most prominent single feature of internal migration in developed countries. Individual local authorities exhibit unusual features relating to special populations, such as school pupils and students. There are challenges in modelling these complexities. Methods: The paper explores methods for modelling internal migration, from the five-year averages used by ONS for subnational projections, developments of the methods proposed by Rogers et al, and Wilson, and other approaches such as kernel regression, and p-splines. The example of Winchester will be used for the purposes of the paper. Data sources: From 2011 to 2016 ONS has published data representing moves between English and Welsh districts by single year of age and sex. These are used as the basis for the construction of smoothed migration schedules. Potential applications: Smoothed migration schedules contribute to making improved local projections and forecasts. They stimulate thinking on how internal migration shapes local populations and the character of local areas. Preliminary results: The complexity of observed local migration patterns requires mixed methods to be used in order to model single year of age flows effectively.

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How has internal Migration changed at the Local Authority level since 2012
Piers Elias, Demographic Support

An extension to last year's presentation on Regional level migration, including an update of the data to 2016/17, this presentation will look at changes to migration patterns for Local Authorities within the North-East Region (and may be other Regions). The revised figures are those that are used in the Mid Year Estimates for the Internal Migration component and use a combination of moves as measured through Patient Register Data and student addresses from the Higher Education Statistical Agency data. The figures for 2011/12 to 2015/16 will be those used in the 2016 Based Sub-national Projections which were published (if all went to plan) in May 2018.

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Migration and mobilities

Session organizers: Hill Kulu (University of St. Andrews), Alan Marshall (University of Edinburgh)

Immigrant integration – Monday 10 September 1.30pm

The impact of early parenthood on the integration of childhood refugees
Ben Wilson[1,2] and Alice Goisis[2,3]; [1]Stockholm University, [2]London School of Economics, [3]Max Plank Institute for Demographic Research

Compared to immigrants from high-income countries, those from lower income origins exhibit slower and less successful integration on a range of important outcomes. Although some existing research suggests that this pattern also holds for refugees and asylum seekers, much less is known about their long-run prospects for integration. Moreover, the role of parenthood in this process has received very little attention. We respond by carrying out a case study of Sweden. Our main research questions are: (1) What are the effects of early childbearing on integration outcomes of childhood refugees? and (2) How do these effects vary over the life course? In answering these questions, we also seek to identify whether there are critical ages for becoming a parent in early adulthood. We use register-based data that cover entire population of immigrants to Sweden who were born from 1971-1980 and arrived in Sweden aged under 19. Our analysis focuses on immigrant's educational, employment, and earnings trajectories from ages 19-30. With respect to the determinants of these outcomes, our main variables of interest relate to parenthood. These are: (a) becoming a parent during early adulthood (usually measured here as becoming a parent before age 30), and (b) the timing of parenthood (i.e. age at first birth). Our results show that childhood refugees who become parents early in life will experience constraints upon their acquisition of education and income. This result holds after controlling for various sources of confounding, including controlling for family-fixed effects.

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Investigating the relationship between naturalisation and integration in the UK
Victoria Donnaloja, London School of Economics

One of the recent most disputed points of public and academic debate concerns the economic, cultural and social integration of settled immigrants. This paper contributes to the understanding of the complicated relationship between citizenship, integration and social cohesion by asking whether more integrated immigrants are more likely to naturalise and whether the relationship between naturalisation and integration changes once citizenship is acquired. The analysis the Understanding Society panel survey, which allows for the observation of respondents' transition into citizenship. The method of analysis employed is bivariate probit modelling. Integration is conceived as holding three dimensions: sense of belonging, socio-economic achievement and political participation. Overall, preliminary results show that immigrants who identify more as British are more rooted and more satisfied with their lives, are more likely to naturalise. However, some of these relationships change after naturalisation. For instance, although immigrants who are employed are more likely to naturalise, they become less likely to hold a job after they have naturalised. A further investigation of this relationship suggests that the employment rate is higher for immigrants who need a visa, i.e. immigrants from developing countries who are not citizens. This interesting result warrants a discussion on our understanding of integration and its relationship with citizenship. If the permanence associated with citizenship discourages immigrants from working, but their sense of national belonging, political participation and life satisfaction are not, we might need to reflect further on our definition of integration firstly, and on the instrumentality of citizenship secondly.

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Measuring migrations : New perspectives by the integration of Basic registers, continuous Census and Social surveys
Simona Cafieri, ISTAT

Over the last years the migration pattern in Italy has completely changed: the inflows of migrants are decreasing and have a complete different composition with a growing component of asylum seekers and person under protection. At the same time Italy continues to deal with the integration of migrants arrived between 1990's and the early 2000s. So we are in a phase of transition, considered 'epochal' from a lot of experts of migration studies, first reception and integration. This is also a new challenge for Statistics, called to provide adequate governance tools for an increasingly complex phenomenon. The integration of administrative data, the use of specific survey and a longitudinal approach represent an important resource for studying the new inflows of migrants, integration of settled foreign population and data on socio-economic characteristics of migrants and their descendants. The paper illustrates the steps made from a system of different sources of data towards an integrated system to measure not only migrations but also social integration and the new challenges offered by the integrated system of Registers, permanent census and social surveys. For example, the multidimensional approach allows us to design the social structure through the characteristics of groups who make up our society. This approach allowed us taking into account, with different roles in the formation of groups, aspects of economic, cultural and social nature.

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International migration: Patterns and determinants – Tuesday 11 September 1.30pm

Global projections of in- and out-migrants by educational attainment
Dilek Yildiz[1], Bilal Barakat[2]; [1]Wittgenstein Centre for Demography and Global Human Capital (IIASA, VID/OEAW, WU), IIASA, VID/OEAW, [2]Wittgenstein Centre for Demography and Global Human Capital (IIASA, VID/OEAW, WU), IIASA, VID/OEAW; UNESCO

Migration is increasingly seen as important to understanding international development in other sectors, including education. At the same time, the public discourse around migration is highly politicized and suffers from numerous misunderstandings and misperceptions based partly in a dearth of robust data and analysis. This research investigates the interactions of migration and education at global level, looking at the extent to which global migration movements accelerate or decelerate the expansion of educational attainment of the world population, and the human capital gain or loss of countries that experience the highest in- or out-migration. The potential for global migration-education interactions are manifold. For instance, if migration shifts children to countries with higher levels of schooling, this effect contributes to raising the global average education level. Counterintuitively, this can occur even if the shift lowers the average attainment in both the sending and receiving country. This could occur if migration is more likely among households with attainment that is above average in the former but below average in the latter. The methodology is built on existing Wittgenstein Centre for Demography and Global Human Capital (WIC) global projections which have already been disaggregated by age groups, gender and educational attainment. We further disaggregate the populations into in-migrants, out-migrants and non-migrants for 201 countries, and project in three scenarios between 2015 and 2100. Zero migration scenario is used as a baseline to understand the effects of migration at country level. When projecting populations, generally, in-migrants are indistinguishable from the native (non-migrant) population upon arrival. The second scenario, tackles this issue by separating and projecting migrant populations and their descendants from non-migrants. This allows for applying different demographic rates, education transitions, and scenarios to non-migrant and migrant populations. The third scenario aims at investigating the 'diaspora' or the lost human capital of a country due to out-migration by projecting the out-migrants of each country as if they have stayed in their origin country and experienced the same demographic rates.

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Changing patterns of international migration and the UK construction industry

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This paper is concerned with the role of international migration in meeting the demand for labour of the construction industry in the UK during the 21st century. The number of construction workers has grown slowly, but the number of UK-born workers has fallen and the workforce is ageing and there is a substantial emerging demand need for workers to replace those retiring/leaving the industry. International migrants are accounting for an increasing share of the workforce. However, the geographical sources of migrant workers are influenced by EU expansion and UK migration policy. For example, the number of international migrant workers has declined since the Brexit referendum. This paper analyses the changing geographical patterns of labour migration, and considers the implications of Brexit for labour recruitment. It reviews the strengths and weaknesses of the data sources available for identifying the characteristics of international labour migrants. The paper analyses the demographic characteristics of international migrants working in construction, comparing them with UK-born workers. The geographical distribution of international migrant workers and their contribution to meeting labour demand in different parts of the UK is considered. Projections of employment by skill and qualifications between 2014 and 2024 and the role of international migration in meeting the industry's changing demand for labour in the context of changing technology and its need for replacement workers is considered.

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Determinants of emigration from Lithuania to the United Kingdom: New evidence from linked administrative and census data

Domantas Jasilionis[1,2], Vlada Stankuniene[2], Sebastian Klusener[1,2], Pavel Grigoriev[1]; [1]Max Planck Institute for Demographic Research, [2]Demographic Research Centre, Vytautas Magnus University

For the last two decades, the United Kingdom has been the major destination for Lithuanian emigrants. According to the officially recorded data, the total number of registered departures to the United Kingdom between 2001 and 2017 exceeded 247 thousand, whereas the corresponding number of returns to Lithuania constituted 63 thousand. The negative net-migration of 184 thousand does not include numerous short- and long-term circular migrants who have never declared their departure to the Lithuanian authorities. Lithuanian official migration statistics have improved since 2010, following the introduction of compulsory health insurance contributions for all permanent residents, including those de facto (but not de jure) living abroad. The current study, based on follow-up data covering the entire adult population from the 2001 and 2011 censuses, provides first population-level evidence about individual- and contextual-level determinants of emigration from Lithuania to the United Kingdom. The first results based on spatial analyses and multilevel modelling highlight a pronounced geographical clustering and a predominant role of individual-level characteristics in predicting the risk of long-term emigration. The study has found that although individual socio-economic disadvantages such as low education and unemployment act as the most important push-out factors, prior migration experience, knowledge of English, urban residence, non-married status, and Russian ethnicity also play a role in emigration decisions. The unique dataset derived by linking the 2001 and 2011 censuses and administrative registers has also enabled to identify specific socio-demographic patterns and lower socio-economic profiles of undeclared emigrants.

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Selection among Swedish migrants to America during the era of mass migration

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Between 1850 and 1930 over 30 million people left Europe for North America, with a majority ending up in the United States. In relative terms in particular, Sweden was one of the most important sending countries. In total 1.1 million Swedes left for the U.S., out of a population of about 5 million. The paper examines the selection mechanisms of migration from Sweden to the U.S. during the age of mass migration. We address whether migrants were positively or negatively selected on occupational status and social origin. We rely on digitized complete censuses with individual-level data for the complete

Swedish population in the decades around the year 1900 (Sweden: 1880, 1890, 1900, 1910). We complement the censuses with Swedish emigration registers, which enables us to accurately identify emigrants. By exploiting these historical sources we are able to create panel data that follows emigrants in Sweden prior to crossing the Atlantic. Moreover, since our data are based on population registers, we are also able to follow Swedes that never emigrated, which therefore will serve as control groups.

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Internal migration and residential mobility – Wednesday 12 September 9.00am

The role of non-resident family ties and events on the migration behaviour of adult children and older parents in Norway
Michael J. Thomas[1] & Lars Dommermuth[2]; [1] Population Research Centre, Faculty of Spatial Sciences, University of Groningen, [2] Statistics Norway (SSB),

While we know family matters in migration, we have little knowledge about how extended family networks influence individual migration behaviours, and more specifically how their role may vary depending on the interacting life-course events and characteristics of linked individuals. With this in mind, we draw on detailed geo-coded register data for Norway for the years 2015 and 2016 and focus on the specific case of internal migration among older parents and their adult children. Our findings support previous research in demonstrating how the relative location of non-resident family members can be important in acting both as a *deterrent* to migration, reducing the likelihood of migration when family are located nearby, and as an *attraction* factor for potential migrants. Among the population of older parents and adult children, almost half of observed internal migration events are directed towards locations where a parent/child lives. Beyond this we find that the geographical clustering of multiple family members reinforces the strength of family both as deterrent and as an attraction factor. From a linked lives perspective, the emergence of demographic events such as child birth, separation and widowhood significantly increase the propensity to migrate, particularly towards family. Interestingly, when events of separation or widowhood occur to the older parent, we find an increase in the propensity for the adult child to migrate towards their parent, though this pattern is not reciprocated when the adult child experiences such events.

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An ever wider South East? Sources of change and continuity in out-migration from London
Tony Champion[1] and Ian Gordon[2]; [1]CURDS, Newcastle University, [2]Department of Geography, London School of Economics

The most durable element in population changes affecting the south east of England has been a deconcentrating current of migration away from its historic core in London. The range over which it has an impact has grown substantially, now involving areas over 100 miles out, mostly via chained rather than direct moves. Long-term comparisons suggest little change in the overall scale of this net movement over the past 40 years or so, but there have been very large shorter-term fluctuations, notably since 2001, which may not be simply cyclical. Moreover, in the context of other relevant changes in international flows and real income growth, it is unclear from previous research whether the drivers remain the same as in the past and, if so, whether they can be expected to continue with the same force into the future. We address these questions with detailed analyses of ONS data on patterns of inter-area movement for 2001-2016 and with time-series modelling of broader inter-regional trends since 1975. The results highlight: the role of age differentials in this migration (within the working-age range); the strength of displacement chain effects in the ring outside London (where housing supply constraints are tightest); and a shift between income growth and immigration as basic drivers of de-concentration. The paper is based on a study of the dynamics of migration across the Wider South East (Gordon et al., 2018) and designed to inform wider debate about strategic issues raised by preparations for a new London Plan.

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Neighbourhood gentrification and residential mobility in post-recession England: direct or indirect displacement?
Mark Fransham, School of Geography and the Environment, University of Oxford

Whilst some have celebrated gentrification as a driver of urban renaissance, others have highlighted the negative impact upon existing residents. In the literature gentrification is often asserted to be the result of direct displacement - involuntary outward mobility of existing, lower income residents - but empirical evidence is limited. This paper addresses two gaps in the literature. First, it proposes a more comprehensive method for assessing neighbourhood gentrification, and second it attempts to observe multiple theoretical causal processes. Neighbourhood gentrification is measured using a combination of six indicators of neighbourhood status, and conceived as a move upwards in the local neighbourhood hierarchy. A matching strategy is employed to select a suitable group of non-gentrifying comparison neighbourhoods. Mobility in and out of gentrifying/non-gentrifying neighbourhoods is observed using data from the UK Household Longitudinal Study, comparing the flow of individuals by income poverty status. Early results suggest that the dominant gentrification process in post-recession England may have been a change in the composition of inwardly mobile residents (indirect displacement), rather than increased outward mobility of low income residents (direct displacement). This would suggest that the negative effects of gentrification do not primarily fall upon individuals leaving those areas, but upon mobile low income individuals whose housing options become restricted in previously low cost areas.

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Measuring the impact of migration on the geography of age segregation in England and Wales
Francisco Rowe, Fran Darlington-Pollock; University of Liverpool

It has been argued that the emergence of socio-spatial age segregation deserves more attention amongst academics and policy-makers alike. More recently, it has been shown that residential segregation has increased between older and younger age groups, particularly in urban areas. However, while a growing body of literature examines key trends in the changing geography of ageing, there is less work considering the demographic causes of these changes. Drawing upon 2011 census data, this paper estimates the impact of internal migration in age residential segregation across local authorities applying a recently developed method – the Compositional Impact of Migration (CIM) index. Our results are illustrative of the extent to which internal migration can have differentiated spatial impacts and contribute to the changing geography of age emerging across England and Wales since 2001. The implications of these results will be considered for policy development, particularly in relation to wider debates on 'ageing in place' and policies regarding social cohesion. Further, in discussing the development of the CIM we demonstrate a need to unify debates examining the 'impact' or role internal migration can play in determining spatial variation in socioeconomic and demographic outcomes.

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Migrant mortality and fertility – Wednesday 12 September 11.30am

Mortality among migrants according to duration of stay in France, 2004-2014
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The migrant mortality advantage (MMA) is generally interpreted as reflecting the selection of atypically healthy people from origin countries followed by progressive and negative acculturation with time spent in the host country. However, studies examining how the MMA evolves over duration of stay are scarce and have paid little attention to gender patterns and the confounding effect of age. We analyze all-cause mortality by duration of stay among male and female migrants in France, paying special attention to the role of age in explaining duration of stay effects. We use the Échantillon Démographique Permanent (EDP), France's largest socio-demographic panel and a representative 1% sample of its population. Mortality was followed-up from 2004 to 2014; parametric survival models were fitted for males and females to

study variation in the MMA over duration of stay. Estimates were adjusted for age, duration of stay, year, education level and marital status for certain age groups. We observe an MMA which is most pronounced among recent arrivals and converges with duration of stay. This pattern is robust to the confounding effect of age and the pattern is consistent among by gender. Our novel findings show there to be an intrinsic pattern of convergence of the MMA towards native mortality over time spent in France independent from age. The consistent pattern by gender suggests males and females experience the same processes associated with generating the MMA. These patterns adhere to the selection-acculturation hypothesis and raise questions about the erosion of migrant health capital in host countries.

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Children's migration and lifestyle-related chronic disease among older parents left behind in India
Jane Falkingham[1], Min Qin[1,2], Athina Vlachantoni[1,2], Maria Evandrou[1,2]; [1]ESRC Centre for Population Change, [2] Centre for Research on Ageing, University of Southampton

Lifestyle-related chronic diseases such as cardiovascular diseases and diabetes are now the leading causes of death and disability in India. Interestingly, those Indian states with the highest prevalence of lifestyle-related chronic disease among older adults are also found to have the highest rates of international or internal outmigration. This paper investigates the association between having migrant (adult) children and older parents' lifestyle-related chronic disease in India. Bi-variate and multivariate analysis are conducted using data from a representative sample of 9507 adults aged 60 and older in seven Indian states from the UNFPA project 'Building Knowledge Base on Ageing in India'. The results show that for any of the diagnosed conditions of hypertension, diabetes and heart disease, the prevalence among older people with a migrant son is higher than among those without. More specifically, the odds ratio of reporting a lifestyle-related chronic disease is higher among older adults with at least one adult son living in another district, State or outside India than those with their children living closer. This study contributes empirical evidence to the academic and policy debate about the consequences of globalization and urbanization for older people's health status generally, and particularly their risk for reporting chronic diseases that relate to changes in their lifestyle.

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The impact of immigration on the fertility behavior of natives: Evidence from Syrians in Turkey
Cevat Giray Aksoy[1], Berkay Ozcan[2]; [1]European Bank of Reconstruction and Development, [2]London School of Economics

The discussion on how migration may alleviate the problems of population ageing often focus on the issues around the fertility of immigrants. Besides, the projection models estimating the impact of migration on population growth typically assume that the natives do not change their fertility behaviour as a response to migration. We challenge this assumption and address the gap in the previous literature by showing that the native fertility is also affected by migration. We use mass immigration from Northern Syria to specific Turkish provinces shortly after 2011 as a source of exogenous variation in exposure to migration and show that natives' fertility in the affected provinces increases relative to the provinces that are less affected by migration. Our findings are consistent across two separate datasets, measuring fertility both at the aggregate and at the individual levels. They are also robust to a battery of specification checks, alternative control groups and an alternative empirical strategy based on an instrumental variable. We provide further analyses to test four potential mechanisms and to show heterogeneity in the fertility responses by population subgroups. We rule out mechanisms related to the cost of childcare and house prices but find that the labour market shocks and social interactions (in the form of fertility diffusion and competitive breeding) are the plausible drivers of native fertility. We further show that the effect is primarily driven by the unskilled and economically inactive women, who became mothers for the first time.

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The impact of the Great Recession on natives and migrants' fertility: A comparison between Italy and Sweden

Giammarco Alderotti[1], Eleonora Mussino[2], Chiara Ludovica Comolli[2]; [1]University of Rome, La Sapienza, [2]University of Stockholm

This study contributes to the empirical research on the nexus between the Great Recession and the fertility decline registered in many European countries in the last decade. The aim is to compare childbearing behavior between natives and migrants in two very different contexts: Italy and Sweden. It has been argued that the recent economic downturn affected fertility negatively, through increasing unemployment and rising insecurity in labor markets (Matysiak et al., 2018; Comolli, 2017). Nevertheless, this issue has scarcely been addressed focusing on the conditions of migrants, which, as a vulnerable group, are more exposed to economic shocks facing higher economic uncertainties (Sobotka et al., 2011). We analyze the effect of the Great Recession on fertility at the micro-level by using data from the Italian LFS and from the Swedish Population Registers. We focus only on women who have a stable employment, in order to perform a better comparison of the two welfare states, since these women certainly have access to the welfare protection in both countries. This selection might lead to incorrect estimates because the sample is not randomly selected; so, we correct for such potential bias by using the Heckman model. We run identical analyses for the two countries. The main explanatory variables are: women's birthplace, a dummy for the post-crisis period, the interaction between the two (so that we can measure the period effect on the two groups), and women's last occupation (ISCO) in order to assess whether the effect of the crisis varies across different jobs.

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Posters

Strand organizers: Ginevra Floridi & Vicky Donnaloja (London School of Economics

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Posters are listed in alphabetical order of first author

Differentials of Low Birth Weight in Sri Lanka: Analysis of the 2016 Demographic and Health Survey in Sri Lanka
Gayathri Abeywickrama, University of Southampton

Despite achieving a satisfactory level in maternal and child health indicators, low birth weight (LBW) is a public health concern in Sri Lanka, as it has remained constant over two decades. This study aims to identify the differentials in LBW in Sri Lanka. Data was obtained from the 2016 Demographic and Health Survey in Sri Lanka. Live births in the 5 years before the survey that have a reported birth weight, either from a written record or mothers' reports were included in the study. Children whose birth weight is less than 2.5 kilograms were considered as the outcome variable. LBW was examined in association with all independent predictors including maternal age, education, ethnicity, religion, region, residential sector, wealth status, maternal BMI, gestational time and child characteristics such as sex, and birth interval. Results found almost 16% of the infants were born with LBW. Mother's low education level, poor wealth, residential sector, ethnic minority, BMI, sex of the child, number of ANC visits, gestational age and birth interval were significant factors of LBW while maternal age, employments and supply of 'Thriposha' had no significant impact. Differentials in maternal education, wealth status, disparities in health by residence, gestational time are key determinants that need to be addressed to reduce the prevalence of LBW in Sri Lanka. This study affirms the importance of promoting effective interventions to reduce differentials of LBW in coming generations. The next step of the study is a multilevel analysis to investigate inequalities in LBW in Sri Lanka.

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Interviewer effects on patterns of non-response: Evaluating the impact on the reasons for contraceptive non-use in Indonesia and the Philippines
Mark Amos, University of Portsmouth

Much social science research is reliant on generating data by questionnaires and interview. Understanding the processes by which these data are generated is therefore vital for ensuring validity of scientific results. Interviewers, as a primary means of collecting responses, are one mode through which the generation of data can be affected. This paper uses the reason for contraceptive non-use module of the Indonesian and Filipino DHS to examine the effect of differential effects of interviewers on response patterns. We find that the probability of providing a response declines across the module, an effect which is robust to the introduction of controls. Using a cross classified multilevel model, we are able to partition the effect of this decline into respondent and interviewer effects. We find that although significant, the substantive effect of interviewers on the response profile is small and the majority of variation is accounted for by interviewee level variation. Therefore, while data collection via interviewers seems to be a reliable mechanism within the DHS, care should be taken to minimise respondent burden to ensure valid responses

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Do young mothers get the care they need? Mapping age disparities across the maternal continuum of care using an holistic clustering technique
Mark *Amos[1], A. Hossain[2], S. Mahmood[2], MN Mia[2], MK Iqbal[2], AH Chowdrey[2], MA Hanifi[2], W. Stones[3], S. Pallikadavath; [1]University of Portsmouth, [2]ICDDR, Bangladesh; [3]University of Malawi & St. George's University of London*

Motherhood during adolescence in a major risk factor for poor outcomes, such as complications during pregnancy, giving birth and during the postnatal period. In part, this results from disproportionately poor access to care provision right across

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the maternal continuum of care to young mothers. This paper analyses whether the Bangladeshi Maternal Health Voucher Scheme helps to reduce this age based inequality. The analysis uses the novel approach of finding clusters of women based on their utilisation patterns across the maternal continuum of care. Cluster analysis is used to identify distinct groupings and allocate women to these groups. Clusters are then related to adolescent status and voucher receipts via multinomial logistic regression controlling for background characteristics. Four clusters of care utilisation are identified. The High Utilisation cluster is characterised by high use of ANC, delivering in a facility, having an SBA at delivery and receiving Postnatal Care within 2 days of the birth. Other clusters are High utilisation except for ANC, Recommended ANC tailing off and Lowest overall utilisation. Adolescent women are least likely to be members of the high overall utilisation cluster and most likely to be members of the Lowest Overall Utilisation. This effect is not eliminated by voucher receipt. Adolescent women have lower levels of care utilisation than both young mothers and older mothers, despite higher levels of risk during pregnancy. Voucher receipt, although it increases the overall level of care utilisation, is not sufficient to raise utilisation among adolescent women to parity with older women.

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The effects of sewerage diffusion on infant and under-five mortality in Peru
Antonella Bancalari, London School of Economics

Although it is well know that sewerage infrastructure played an important role in the decrease of early-life mortality rates in high-income countries during the past centuries, little is known about the effectiveness of a sewerage diffusion initiative in a low capacity, middle-income country government. This paper studies the effect of a nation-wide sewerage diffusion government campaign that took place in Peru between 2005 and 2015 on infant and under five mortality rates. I use original administrative data sources and rely on an instrumental variable approach exploiting the fact that gradient affects a district's technical suitability for sewerage. I find that in districts that experienced greater sewerage diffusion, infant and under-five mortality rates increased, though the impact on IMR is larger in magnitude. These unintended mortality consequences seem to be linked to the construction works required to install sewerage lines. Preliminary results suggest that these findings are driven by deaths from infectious and environmental diseases. Any survival gains from sewerage diffusion are apparently netted-out by these deaths. Infant mortality rates started declining only three years after public sewers were available, perhaps because environmental quality improved and sewerage adoption increased over time. The results further suggest that access to piped-water may alleviate these adverse mortality impacts of sewerage diffusion. Taken together, my results suggest a failure of the government's urban infrastructure planning and highlight the need for better environmental assessments of sanitation infrastructure projects.

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Administrative data at the core of international migration statistics: The story so far
Tanita Barnett, Office for National Statistics

The Migration Statistics Division, in close collaboration with the Integrated Data Development team at the Office for National Statistics (ONS), have been focused on interpreting and understanding the use of administrative data to inform international migration related policy using migration statistics. Migration statistics have featured heavily in political discussions over recent years, and ONS have a responsibility to ensure these are fit for purpose. By introducing administrative data into migration statistics, ONS can start to understand the gaps, similarities and differences with the traditional survey and estimation methodology currently used. Figures from the 2016 Annual Population Survey on migrants in the labour market has been updated to reflect the trends in 2017. Where possible, direct comparisons have been made to administrative sources ONS have access to, which compares the two methods of data collection at a national level. There is now a motivation to truly understand how administrative data can make an impact on migration statistics, which is outlined in the impact of international migrants on the UK economy work that ONS are presenting on and driving

forward. Lastly, a brief overview is provided which encapsulates ONS' journey into putting administrative data at the core of migration statistics and proposed plans for the future.

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Understanding the trends in age at first marriage and its associated factors in Malawi: Evidence from Malawi Demographic and Health Survey data,1992-2016
Ololade Baruwa, University of Witwatersrand

Objectives; the aim of the present study is to examine the trend of age at first marriage and effect of selected socio-demographic factors on changes in the age at first marriage in Malawi. Method; the data for this study was from Malawi Demographic and Health Survey data of 1992, 2000, 2004-05, 2010, and 2015 survey. Women who were never married were right censored as of the date of survey. Kaplan Meier survival function was used to estimate the probabilities of first marriage not occurring until certain ages of women while Cox proportional hazard regression was used to model the timing of first birth at 95% confidence interval. Results; the results showed that the median age at first marriage remained at 17yrs between the periods of 1992-2015. The trends in age at first marriage followed the same general pattern across age groups, place of education, education, and region and employment status. The hazard of early marriage is statistically significantly lower among women living in rural areas, higher among women with primary, secondary and higher education, and lower among women who are working. Conclusion; this study showed that there are little or no differences in median age at first marriage across the selected socio-demographic characteristics of women in Malawi and also, age at first marriage is affected by place of residence, education and working status. Socio-cultural norms of child marriage should be aborted, while education on the consequences of child marriage and early child bearing should be promoted.

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What about the men? Men and women accessing services due to domestic violence needs
Janet Bowstead, Royal Holloway, University of London

Local service provision on domestic violence in the UK was originally developed by local groups, responding to the needs of women and children. Services have more recently received some mainstream funding and political and policy support, but are still not a statutory requirement in a local area. They are therefore particularly vulnerable to local budget cuts. From 2003-11 there was a national (England) Supporting People funding programme for housing â€"related support services, addressing a wide range of needs, including for those at risk of domestic violence. The programme data, which have been de-identified and archived, provide demographic and location data for individuals accessing services either primarily because of domestic violence, or where domestic violence is amongst their support needs. Analysis of two yearsâ€™ data (over 60,000 cases), including both men and women at risk of domestic violence, provides evidence of the different needs and patterns of help-seeking for men and women. Findings include that men make up 3.2% of those at risk of domestic violence, and are more likely to have that as a secondary need to mental health problems or homelessness. Men are more likely to access services without relocating or in their local authority, whereas women are more likely to relocate and travel longer distances; and to be accompanied by children. Such differences can be used to inform local policy decisions and service planning; as well as make the case for the need to re-establish national service planning and monitoring to enable more informed and effective service decisions.

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EU QUERO (I want): Strengthening the maternal and child healthcare system over the first 1000 days in Brazil

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The overarching aim of EU QUERO ('I want' in Portuguese) is to increase the quality of and access to maternal, newborn, and child health (MNCH) services available in the first 1000 days of life from conception in two contrasting states in Brazil, Maranhão and Goiás, through community engagement and social accountability. The project will deliver its objective by developing and conducting a feasibility of a complex social accountability intervention to monitor the quality of delivery of health programmes throughout four phases of the 1000 days: (i) pre-natal, (ii) birth, (iii) postpartum and newborn, and (iv) child healthcare up to two years of age. EU QUERO addresses the following research question: What is the feasibility of a full trial of a complex community-based accountability and rights-based education intervention to strengthen the quality of MNCH services and improve health outcomes in Maranhão and Goiás states? The aim of this paper is to present the preliminary results of the first stage of the project, to develop scorecards for each basic health unit within the two states on a range of dimensions. These scorecards form the baseline for the implementation of the feasibility intervention of rights based education. Maps of the results of these preliminary scorecards will be shown in order to highlight areas with good or poor care. The next steps of the project will be highlighted alongside policy recommendations that will be developed from the scorecards.

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Love and conflicts at distance: Non-coresidential unions and household formation

Alexandra-Andreea Ciritel, A. Berrington, , B. Perelli-Harris; University of Southampton

This paper investigates the transition to cohabitation by taking into consideration a range of socio-psychological and sexuality variables. Using data from the Panel Analysis of Intimate Relationships and Family Dynamics (pairfam), the authors investigate the role of conflicts and conflict behaviour in union stability. Aspects rarely studied by demographers, such as sexual competence and sexual intimacy are taking into consideration as well. Event history analysis is going to be applied to answer to the research questions.

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An introduction to the Scottish Longitudinal Study (SLS)

Tom Clemens, L. Williamson, C. Dibben; National Records of Scotland

This poster will introduce the SLS and the datasets, the application process for researchers interested in using the SLS and outline research examples. The Longitudinal Studies Centre – Scotland (LSCS) was established in 2001 and hosts the Scottish Longitudinal Study (SLS). This study links together routinely collected administrative data for a 5.3% representative sample of the Scottish population (about 270,000 people). It currently includes a wealth of information from the censuses starting in 1991, vital events registrations (births, deaths and marriages), Scottish education data, and with appropriate permissions can be linked to NHS health data including cancer registry and hospital admission data. The size and scope of the SLS make it an unparalleled resource in Scotland for analysing a range of socio-economic, demographic and health questions. Additionally, the longitudinal nature of the SLS is particularly valuable, allowing an exploration of causality in a way that cross-sectional data collected at a single point in time does not. In this way, the SLS can provide insights into the health and social status of the Scottish population and, crucially, how it changes over time. The SLS is constantly evolving and in the next few years we have plans for a number of important enhancements including linkages to justice data, Scottish school leavers' destination survey, historical birth cohort linkages and beyond 2019 we will be investigating the possibility of linking to further and higher education data, information on educational attainment in private schools, social security data, the Scottish Diabetes Register data and care home data. We welcome the opportunity to discuss new project ideas and would encourage interested users to come and find us at our poster or email us.

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Hard to Count index for the 2021 Census
Ercilia Dini, Office for National Statistics

The 2021 Census, unlike previous censuses, will undertake the collection using an online questionnaire as the primary response mode. This change in the basic collection mode means that non-response patterns observed in certain population groups in the 2001 and 2011 censuses may be different in the 2021 Census. In addition to the population groups that we know do not respond to a census there will be groups of people who are digitally excluded as these people will require digital assistance or a way to respond to the census that may not be via the primary mode. The ONS is carrying out research to develop a Hard-to-Count (HtC) index to identify sub-populations/geographical areas at risk of census non-response. This will be used as a tool in the 2021 Census to support pre-planning of field follow-up and in the design of the Census Coverage Survey and will be key to achieving high quality census estimates. The HtC index is composed of two domains: the digital domain and the willingness to self-respond domain. The digital domain is built as an indicator to measure infra-structures available which enable households to respond to an online census. The willingness domain is constructed using an area level (Lower Super Output) model that predicts non-response by day 10 after census day. The covariates used to build the model parameters are from previous census and administrative data sources. The presentation will include the methodology used to develop the HtC index domains, preliminary results obtained and recommendations for further research.

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The association between education and prevalance of type two diabetes: A Saudi population-based study using the National Health Interview Survey
Abrar Hasan Fallatah, University of Southampton

Background: In recent years, Saudi Arabia has faced rapid socioeconomic development that has resulted in a high prevalence of type two diabetes (T2DM). According to the WHO, Saudi Arabia has the 7th highest prevalence of diabetes in the world and 2nd in the Middle East. This study aims, to investigate the association between education and the prevalence of T2DM; and further, to examine whether any factors mediate this relationship. Finally, the study will identify whether this relationship varies by gender. Methods: Saudi national participants (N= 4,390) from the Saudi Health Interview Survey (SHIS, 2013) were included. Logistic regression analysis used to investigate the association between education and T2DM: doctor-diagnosed and/ or (HbA1c ≥ 6.5 %). This outcome classified based on glycated-Haemoglobin (HbA1c) test and self-reported diagnosed. Six models used for investigate this associations: Model-1: univariate; Model-2: demographic factors; Model-3: administrative region; Model-4: socioeconomic factors; Model-5: lifestyle factors. The final model adds an education-gender interaction. Results: The weighted-prevalence was 14.9%. In the univariate model, the association between education and T2DM was significant. In comparison to those who had a university-degree or above, the odds of an individual who could not read or write having diabetes was 4.05 higher (95% CI: 2.92 to 5.62). The corresponding odds ratio for those with no formal-education was 2.37 (95% CI: 1.61, 3.49). However, this relationship was insignificant after adjustment for demographic factors and region. In models 4 and 5, this association was significant in different education groups. In the final model, the interactions between education levels with gender were insignificant. Conclusion: There is no significant association between education and the prevalence of T2DM after controlling for other factors. These results can be highlighted that public health intervention strategies need to improve lifestyle for all socio-economic groups

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Geographical hotspots of ethnic and immigrant labour market outcomes
Sarah Garlick, University of Liverpool

This poster will present initial findings from 'Geographical hotspots of ethnic and immigrant labour market outcomes', a theme of my ESRC North West Doctoral Training Centre-funded PhD research ('Geographic inequalities in ethnic minority and immigrant labour market experiences in England and Wales'). The theme aims to explore, using Census data for England and Wales, whether the main labour market outcomes (employee, self-employed and unemployed) vary for different socio-demographic groups (for example for people from different ethnic groups and people born in or outside of the UK). The inclusion of area-level information in Census microdata offers an opportunity to explore whether where someone lives contributes to an explanation of their labour market outcome and therefore whether multilevel modelling would be appropriate. In addition to research into labour market outcomes for individuals, spatial autocorrelation will be applied to aggregate Census data for small areas, including the Middle Super Output Area statistical geography. The aim will be to assess whether there are distinct geographic differences in labour market outcomes and whether local areas share similar labour market characteristics. Spatial analysis of this kind provides an opportunity for quantitative demographic analysis to be presented in a visual format, which could enable it to reach a wider audience.

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The effect of temperature shocks on health at birth: evidence from Hungary
Tamas Hajdu[1], G. Hajdu[2]; [1]Centre for Economic and Regional Studies of the Hungarian Academy of Sciences; [2]Centre for Social Sciences of the Hungarian Academy of Sciences

We analyze the effect of temperature during the pregnancy on the outcomes of live births in Hungary. Our main research question is whether temperature shocks (defined as the occurrence of extremely hot/cold days) in utero influence health at birth. In addition, we try to answer the question: how do the estimated effects differ between high- and low-status families? Birth registry data of more than 1 million newborns between 2000 and 2014 are matched with daily temperature data. Matching is based on the place of residence of the mother at the time of the delivery. Birth registry data that covers the entire population come from the Hungarian Central Statistical Office, whereas city-level weather data come from the European Climate Assessment & Dataset project. Our dependent variables are indicators of health at birth (e.g. low birth weight, pre-term birth). These indicators are regressed on the weather conditions during the pregnancy. Although variation in weather over time supposed to be exogenous, we are able to control for important socio-demographic factors that might influence newborns' health. The effects of temperature are identified from interannual variation in weather conditions after adjustment for time-invariant seasonal and regional effects, common shocks and time trend (by seasonal, time and location fixed effects). Our first results suggest that extremely hot days during pregnancy increase the probability of low birth weight and the probability of pre-term birth. In addition, exposure to extremely hot weather during the pregnancy seems to have a stronger effect on newborns of low educated women.

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Son Preference UK: Mapping stakeholders
James Hassett, S. Dubuc, B. Kuang; University of Reading

Demographic evidence of son preference and/or prenatal sex-selection against females are of much relevance to a variety of policy makers and stakeholders. The proposed poster presents a summary of the findings from a stakeholder mapping activity as part of a larger multi-disciplinary ESRC project on son preference and prenatal sex-selection in the UK. The poster presents the variety of stakeholders, identifying and analysing stakeholders' perspectives and their relationships to other stakeholders. How demographic evidence is linked to their specific objectives will be analysed. The work is in progress and will be completed by end of July 2018.

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Examining spatial effects in UK elections using Bayesian Models
J. Hilton, University of Southampton

The result of the 2017 election produced somewhat different results than had been predicted by polling companies, with the notable exception of the work done by Ben Lauderdale and Yougov (Lauderdale et al. 2017). Patterns of voting across age and space shifted somewhat from previous elections, with Labour performing strongly in metropolitan areas, but less well in more traditional working-class areas in the north. This paper looks to examine spatial patterns in the results of the recent British election using Bayesian conditional auto-regressive modelling. Integrated Nested Laplace Approximations are used to fit Besag-type models to predict counts of votes for the main parties, considering the registered electorate as the relevant exposure to risk (Blangiardo and Cameletti 2015).

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Field interviewer effects on the quality of malaria diagnosis in Sub-Saharan Africa
Ngianga Kandala, M. Amos, S. Pallikadavath; University of Portsmouth*

Malaria is a life threatening disease affecting 216 million people in 91 countries and remains endemic in 106 countries. Sub-Saharan Africa has a disproportionate high share of the global malaria burden. Yet though parasite-based diagnosis is increasing, most suspected cases of malaria are still not properly diagnosed. Of particular concern is variability in the quality of diagnosis associated with the team performing diagnosis. This analysis examines variability in the quality of malaria diagnoses using Demographic and Health survey data from the sub Saharan Africa region. We perform sensitivity/specificity analysis and examine the incidence of false positive/negative results. We then use multilevel random intercept logistic regression models to evaluate variability in the accuracy in test administration by clustering individual respondents within the interviewing team. Variation partition coefficients are then calculated to examine the proportion of variation in the rate of false diagnoses to examine the proportion of variation attributable to interviewer teams. Initial results indicate that around 47.2% of variation in the false positive rate is attributable to interviewer level effects, and this is robust to the introduction of controls (39.8%). A similarly high proportion of variation for false negatives is attributable to interviewer level effects: 52.9% which attenuates to 44.2% in the presence of controls. Such large variation in the consistency of the diagnostic test procedure attributable to interviewing teams is concerning and should be addressed during training for field test procedures.

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Gender gap, intra-household bargaining and sex-selective abortion in Albania
Keiti Kondi, Universite Catholique de Louvain

Among European countries Albania has by far the highest sex ratio at birth with 1.12 boys per girls, compared to the European average of 1.058. Considering this imbalance, the aim of this poster is to analyze a mechanism that measures the sensitivity between sex ratios, potential gender gap measures and investment in children. We focus on the reasons behind parent's choice for the sex of their children by considering different preferences for each of them. We try to solve the problematic of sex selective abortion by developing a minimalistic model which incorporates different utilities for boys and girls, the bargaining between family members and the decision about abortion dependant on its cost. This cost affects decisions on the composition of the family. We calibrate the model using data of the Demographic and Health Survey dataset on Albania for the year 2008. Furthermore we find for what values of the gender gap and investment in children we can get normal values of the sex ratio. To conclude we propose different policies that can be associated to the decline of the sex ratio disparity.

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Evaluation of population development in Czechia at the municipal level in the period 1992-2015 using the Webb diagram
Jana Krestanova, Charles University

The Webb diagram is a graphic method that can be used to compare the contribution of natural change and net migration to overall population growth or decline. Webb's typology, based on the links between increases and decreases, includes eight types of population change. The aim of the poster is to introduce the Webb diagram method and to evaluate the dynamics of population development in Czechia, both at the level of whole and small regional units (regions, municipalities) in the period 1992-2015 (divided into four five-year periods for the elimination of random fluctuations in demographically less numerous units). In the first period of the level of Czechia as a whole, the total population was decreasing, which was mainly determined by natural decrease. In the following three periods the total population was increasing. While in the period 2001-2005 the increase was caused by a positive level of a migration rate which exceeded natural decrease, in the periods 2006-2010 and 2011-2015 population growth was resulted by a positive natural change. However, at the level of lower regional units the development of natural and mechanical change is more varied.

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Fighting the practice of Female Genital Mutilation in the UK
Dominika Kumor, Office for National Statistics

The issue of Female Genital Mutilation (FGM), and the efforts undertaken to eradicate the harmful and dangerous procedure, have never been more present on the international agenda. Not only the African and Asian countries with history of FGM prevalence, but also Western countries hosting large diasporas from FGM practicing countries such as the United Kingdom, face a distinctive set of challenges to successfully tackle the complex problem. The project presents an analysis of data from UK Census 2011 on female Somali diaspora in the UK, enhanced by the inclusion of available administrative data on Somali female asylum seekers in 2011-2015. Moreover, mortality analysis was applied to the combined groups to obtain a more accurate population estimate and FGM risk differentiation. While the results indicate a small increase in overall population size, it also reveals, for the first time, the number of most vulnerable Somali women and girls remaining unaccounted for by official statistics and the support system for the discontinuation of FGM. Using Mackie's social convention theory (1996), and parameters outlining how migration influences the FGM practice as proposed by Johnsdotter (2004), the context of the Somali diaspora in the UK is discussed. The analysis suggests that the dynamic nature of FGM practice outside the country of origin, and its socio-cultural logic, should be at the heart of successful efforts to eliminate FGM in the UK and, despite the progress made, there may be significant, often structural barriers experienced by the Somali diaspora that should be urgently addressed.

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Charting the course of demographic change in England & Wales: The ONS Longitudinal Study
Edward Morgan, R. Jathoonia; Office for National Statistics

The ONS Longitudinal Study (LS) contains linked census and life event data for 1% of the population of England and Wales. Information is linked from five successive censuses (1971 to 2011) and life events data, including birth, death and cancer registrations. The LS contains information on households, economic activity, qualifications and living arrangements at each Census supporting studies on the life course. Questions asked for the first time in 2011 included: intention to stay, passports held, visitors, second address, main language and civil partnerships. At BSPS 2018, we highlight the great research potential of the ONS LS to chart the course of demographic change in England and Wales. The number of possible research topics is large and members of the ONS LS Team will be on hand at the conference to discuss possible projects. Numerous study designs are available to suit the interests and objectives of research teams. Furthermore, we highlight two examples of recent research carried out using LS data. One of which examines how the employment status of women aged 16-49 in 2001 and 26-59 in 2011 changed over the period, according to whether they had children or not

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Impact of migration on UK industries
Matthew Morrison, C. Hayter; Office for National Statistics

The Office for National Statistics' (ONS) Analytical Impact Team are exploring the impact that migration has on UK industries. The effect migration has on the labour market in the UK in uneven. Some industries, such as construction and agriculture, are more reliant on overseas workers. In addition, some regions, such as London and the South East, have higher migrant populations so would be more sensitive to changes in the composition of the labour market. Migrants tend to be younger than UK workers and more likely to be overqualified for their jobs. However, between different nationalities there are differences in the type of work they undertake and other factors such as self-employment. At BSPS 2018, we will be presenting the recent research carried out by our team exploring the impact of migration on both the Agricultural and Construction industry. This will include presenting what the available data can tell us about migrants in the industry and highlights the difficulties in capturing seasonal workers

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They know everything' : Exploring lay- and mid- level health workers' attitudes to and roles in abortion-related information and care-provision in Karnataka, India
Rishita Nandagiri, London School of Economics

Safe abortion access is impeded by multiple barriers, including legal status of abortion, availability of trained providers, and degree of abortion knowledge. Even where abortion is legally available, it may remain inaccessible due to lack of accurate abortion information and knowledge, lack of trained providers, especially in rural areas, and limiting provision of services to physicians or specialists. The paucity of trained/available providers may lead to delays in access to care or abortions taking place under unsafe conditions. Task-sharing/task-shifting enables lay and mid-level healthcare professionals such as nurses, midwives, pharmacists, and community health workers (CHWs) in healthcare service provision. In India, female CHWs and pharmacists act as the key interface between public health systems and rural communities. Equipped with pregnancy testing kits, they are present for women's first acknowledgement or confirmation of pregnancy. As trusted confidants and sources of information, women turn to CHWs for advice and support in their abortion decision-making. Yet, their attitudes to abortion, and current and potential roles in abortion access remain underexplored. A nested mixed-methods (questionnaires=112, in-depth interviews=21) study design was utilised to collect data over eight months in rural villages in two districts in Karnataka, India. Preliminary findings suggest that CHWs display some stigmatising attitudes and lack knowledge of current laws; and influence abortion trajectories by providing advice or withholding information. Their roles and attitudes are shaped by and function within social, political, and cultural contexts. Task-sharing efforts must account for social, political, and cultural relations that inform CHWs negotiations, subversions, & service provision.

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Meeting Census 2021 user needs: the development of an online flexible dissemination system
Su Oinn, Office for National Statistics

The Office for National Statistics is putting user needs at the heart of preparations for the dissemination of the 2021 Census. After a review of user feedback regarding their 2011 Census outputs experience, we have identified our strategic aims to improve the timeliness, accessibility and flexibility of the data delivery for the 2021 Census. An integrated ONS team from Census and Methodology are working in collaboration on an innovative and agile solution to develop an online flexible dissemination system for 2021 Census outputs. This system will use dynamic Statistical Disclosure Control methods to enable users to query and define their own 2021 Census outputs. Preliminary results include the development of a prototype system based on a 60 million record artificial database that contains personal and household variables at 7 different levels of geography. This poster will outline how we aim to improve on the dissemination of 2011 Census outputs and successfully meet user needs for 2021, the dynamic Statistical Disclosure Control methodology used, its benefits and trade-offs and how we are involving users on the development of the flexible dissemination system.

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Spatial variations in mortality due to heat waves in Andalusia, Southern Spain

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The increase in mean annual temperatures remains a robust trend globally. This study provides a comprehensive analytical insight on the effects of extreme summer temperatures on human health and survival on mid- and short-term time scales. Individual demographic and socioeconomic data were derived from the Longitudinal Statistics on Survival and Longevity of Andalusia and aggregated to cells with resolution of 20 sq. km. We also gathered relevant meteorological measurements for 2000-2016 and performed time-space data mining to capture local patterns of heat wave phenomenon across Andalusia. Specific attention was paid to temperature fluctuations with particular focus on large urban areas. We explored causal relationship between the cumulative exposures and mortality by age, sex and educational attainment level across various locations at a daily time-scale. The results of non-spatial modelling revealed a clear excess mortality time-lag with the duration of up to 14 days after the stress event, with an over 2-fold increase in mortality in the lower educated elderly group, with respect to days without risk alert. To model the dependences across grid cells we applied a Conditional Autoregression (convolution) model within a wider Integrated Nested Laplace Approximation approach which showed that spatial confounding between the spatially structured (random) effects and fixed-effect covariates is affecting the fixed effects estimates, however these differences are minimal. The application of scenarios varying in risk magnitude to the areas identified as "hot spots" for long-term heat stress suggests a potential change of mortality pattern in the area.

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Does healthcare voucher provision improve utilization in the continuum of maternal and newborn care for poor pregnant women?: Experience from a quasi-experimental study

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Background: Since 2007, Bangladesh has implemented a voucher scheme to reducing access barriers to maternal care, particularly for poorer pregnant women. However, the effect of the scheme on the continuum of maternal care is yet to be explored. With the growing attention of development organizations around the world on ensuring continuum of care to improve maternal, newborn and child health, the current paper analyses the effect of vouchers on the entirety of maternal continuum of care. Methods: 3,593 women with children aged 0-23 months in Chittagong and Sylhet divisions of Bangladesh were interviewed. Cluster analysis was used based on utilisation across the continuum of care. Clusters were regressed on voucher receipt to identify underlying relationship between voucher receipt and care utilization after controlling for other variables. Results: We identified 4 clusters of women based on utilisation pattern. 20.3% women belonged to the highest-utilisation cluster maintaining the complete continuum of care, whereas 39.3% belonged to the lowest-utilisation cluster with intermittent care. For poor women, the probability of voucher recipients belonging to the highest-utilization group was much higher compared to that of the non-voucher poor women (36.1% vs. 7.1%). Conclusion: Programmatic investments in many developing countries have been historically directed towards financing individual service components. In recent years it has been realized that access to quality healthcare services in pregnancy, childbirth and postnatal period may yield multiple returns on investment. A coherent continuum based approach to understanding maternal care seeking behaviour can be anticipated to have substantial policy implications for programme design

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Male experiences of sexual assault: Social, emotional and sexual consequences
Charlotte Petersson, University of Malmo

Sexual assault of men is a recent field of research in the medical, psychological and sociological literature. Much research have focused on documenting the prevalence of male sexual assault, while trying to understand how men make sense of such experiences has received significantly less attention. In fact, myths suggest that men who have experienced sexual assault are relatively unharmed or unaffected by the violation. This phenomenological study aims to understand the lived experiences of men sexually assaulted in childhood or in adulthood and focuses on what life is like for them in intimate relationships. The main research question addressed in the study concerns how a history of sexual assault affect the psychosocial well-being and sexual and reproductive health of male victims, placing emphasis on the long-term emotional, sexual and interpersonal consequences of the sexual assault. The analysis is based on multiple in-depth interviews with 10 sexually assaulted male adults. Other forms of data include diaries, notes and letters written by the participants, reports from authorities and photos, articles, books, poetry, music and other forms of art created by the participants in response to their experiences of sexual assault. Findings suggest that the impact of sexual assault on men's perceived well-being may differ, but are strongly related to lasting emotional, sexual and/or social consequences, which affect their ability to form and maintain intimate relationships in various ways. The social responses and emotional support from partners, family and friends, are particularly important for the victims psychosocial well-being.

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Ethnic diversity in mortality: case of Latvia at the beginning of 21 century
Denise Ponomarjova, University of Latvia

Background: Latvia has one of the most ethnically and culturally diverse population in Europe. The latest data from the Central Statistical Bureau of Latvia (2017) shows that 62% (~1,2 millions) of the total population is made up by Latvians, whereas the rest population are ethnic minorities, with the statistically largest groups being Russians, Belarusians, Ukrainian, Poles and others. Ethnic background as a variable has always played an important role in population statistics in sociological and demographic studies in Latvia, which have been primarily analysed with such variables as citizenship, place of birth and language use. Aim and data: Aim of the study is to analyse the ethnic differences in mortality in Latvia at the beginning of the 21st century. Based on the data from the Central Statistical Bureau of Latvia linked to the last Population and Housing Censuses in 2000 and 2011, life expectancy and mortality rates by ethnicity, gender and death causes are calculated. The two numerically largest ethnic groups, Latvians and Russians, are analysed. Also a brief overview about the ethnic composition of the population, geographical distribution of ethnic groups (place of residence), ethnically mixed marriages and other demographic variables is presented. Preliminary results: Ethnic differentiation in mortality is affected mostly by heterogeneity within ethnic groups. Ethnic differences in mortality still exist, but they have diminished in a long term perspective.

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'Counting us will reduce us'; Implications of Gambian cultural elements for data collection
Anne Rerimoi, J. Niemann, M. Jasseh, I. Lange, G. Reniers, IM Timaeus; London School of Hygiene & Tropical Medicine

Introduction: Knowledge of the cultural elements in a community can aid in improving data collection and quality. This study describes the implications of Gambian cultural beliefs, attitudes and discourse on pregnancy, births and child mortality data collection. Methods: 20 in-depth interviews, 3 key informant interviews, observation and a focus group discussion were conducted in two rural health and demographic surveillance systems covering 15% of the population in The Gambia. Key findings: We found as expected that sensitive questions related to pregnancy and its outcomes were best asked by women. The Fula in particular, did not like to be counted as counting was linked to death, but this could be circumvented by referring to inanimate objects, for example asking 'how many sticks' to represent people and by enumerating singly as opposed to summarizing totals which had a threatening connotation. Asking about siblings proved

difficult among the Fula and Serahule communities and women were hesitant to talk about menstruation. Probing using two sets of questions, enhancing rapport through empathy, adherence to the dress code and cultural norms, shared experience of menstruation and pregnancy and ensuring confidentiality yielded more information even on adverse pregnancy outcomes. Potential applications: For better data accuracy, the following can be considered. Formative research when planning projects; employing trained and skilled women who are adherent to social norms to ask reproductive-related questions; use of symbolic language for enumeration purposes; full birth/pregnancy histories. As sibling histories are a modality for maternal mortality estimation, further sensitive nuanced qualitative inquiry are needed.

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Designing and testing a marital status question for the 2021 Census
James Robards, E. Sharland, A. Sharfman; Office for National Statistics

As part of the 2021 Census topic consultation in 2015, the Office for National Statistics (ONS) made a commitment to review the marital status question in light of the Marriages (Same Sex couples) Act 2013. A user need for separate population estimates by marital status for same-sex couples was identified. As a starting point, the 2011 Census question on marital status was reviewed and redesigned to meet user need. To test the acceptability of the question, testing took place in autumn 2017 with an aim to assess overall acceptability and acceptability by different socio-demographic groups. This testing indicated that the redesigned question was acceptable and could be included in further testing. Following the acceptability testing, additional stakeholder feedback on the question design was received and minor changes to the next iteration were completed. The second phase of testing has been a series of cognitive interviews with an aim to assess understanding of the question. Cognitive interviews were conducted between January and March 2018 across different participant characteristics. Results of the cognitive testing are due in spring 2018 and this phase of the testing will be followed by further quantitative testing to assess the redesigned question. This poster will outline research and development work informing a question design for 2021 and outline some of the key considerations in this process.

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Why have improvements in life expectancy in the UK slowed?
Sophie Sanders, Office for National Statistics

After decades of steadily improving life expectancy in the UK, increases in how long we can expect to live in recent years have noticeably slowed. As this stalling in mortality improvements has prolonged, there is growing evidence this may be due to medium or long term influences rather than a short term blip in the trend. Life expectancy is a powerful health indicator which drives important policies that impact everyone in everyday life such as setting the State Pension age. It is therefore becoming increasingly important to understand what might be driving this change in trend. We know there have been longstanding differences in life expectancy in different parts of the UK. England, Wales, Scotland and Northern Ireland have all seen recent slowdowns in life expectancy improvements but has this been occurring to the same extent and for the same ages? Through detailed analysis of age standardised and age specific mortality rates and period life expectancies we are investigating how the slowing in mortality improvements varies for different ages and countries of the UK. Due to interactions between many health, environmental, lifestyle and economic factors all affecting someone's life expectancy, we cannot say for sure what is directly causing these changes. However, our research will examine a broad range of data to uncover what other recent or emerging changes in trends have occurred that might be contributing. This presentation will discuss our findings and summarise ONS, position on why improvements in life expectancy in the UK have slowed.

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Child morbidity and health in historic London: Evidence from the Foundling Hospital, 1892-1919
Eric Schneider, London School of Economics

This paper employs a recently constructed cohort study, based on the records of the London Foundling Hospital 1892-1919 (Arthi and Schneider 2017), to study historical child morbidity from infancy to age 15. The London Foundling Hospital was an orphanage that admitted the first-born sons and daughters of unmarried mothers trying to escape the stigma of illegitimacy. The hospital cared for the children it admitted from infancy until the age of 15 or 16. The Foundling Hospital records are particularly rich because they kept careful medical records for several stages in the children's lives including information about anthropometric outcomes, nutrition and morbidity. They recorded morbidity for three periods of each child's life: the diseases present on admission to the hospital; the diseases the children were treated for while they were fostered in the countryside between infancy and age five; and the diseases the children were treated for while on the main Foundling Hospital site in central London between the ages of five and 15 or 16. For the final period, we have also linked the children's medical records to the weekly infirmary reports which contain the dates each child entered and left the infirmary and the diseases they were treated for in the infirmary. Thus, we are able to calculate sickness duration and prevalence. The paper seeks to answer two questions: 1) what were the patterns of child morbidity across age for Foundling children? and 2) how is morbidity associated with other proxies of health at different stages of development?

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Surviving the 19th century – a sample of ONS Longitudinal Study members who were born before 1901
Nicola Shelton, University College London

The ONS Longitudinal Study includes individual and household level microdata for approximately 1% sample of the population of England and Wales. There has been longitudinal follow-up since 1971 linking all census data. 43,610 individuals born prior to 1901 were alive and enumerated in at least one decennial England and Wales census between 1971 and 2001 and included in the LS, equating to over 4 million people in England and Wales. The causes of death of the LS members are recorded and linked to their census data. For adults born in the 19th century who survived to 1971 the main underlying cause of death was IHD with 24% of deaths from this cause. Among this group age adjusted survival to 1981 using logistic regression those currently or formerly employed in skilled manual (OR=0.55) partly skilled (OR=0.67) and unskilled (OR=0.55) had lower odds compared with professional occupations. For more information on the Longitudinal Study see ww.ucl.ac.uk/Celsius

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Complex networks of population density
Roko Mišetić, Toni Ćosić, Hrvoje Štefančić; Catholic University of Croatia

In the last two decades complex networks have been shown to provide a very useful framework for understanding and analysis of systems in various fields of society, science and technology. We present a novel approach based on complex network theory aimed at understanding and description of spatial patterns of population density. For a given country with a chosen level of territorial division a series of complex networks is produced depending on the lower threshold of population density. Topological properties of the obtained networks are analyzed and their temporal evolution is studied. Two examples are presented in a more detail: Great Britain at the NUTS3 territorial level (using the data from Eurostat databases) and Croatia at the municipal level (using the data from the Croatian Bureau of Statistics). Practical applications

of the obtained networks in spatial planning are discussed. Ongoing work on the application of the developed network formalism at the European level is outlined.

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Global trends in lifespan differential
Toni Ćosić, Roko Mišetić, Hrvoje Štefančić; Catholic University of Croatia

Average lifespan in virtually all countries nowadays is an indicator with a growing tendency. Although such a tendency can be easily interpreted in terms of causes such as global advances in standard of living, availability of healthcare and improved prevention of unhealthy lifestyles, an interesting question is if male and female populations in a particular country follow the same trends. A convenient quantity for the analysis of differences in average lifespan trends is a difference of average lifespan between females and males, called the lifespan differential. Using the data on mortality patterns form The Human Mortality Database (www.mortality.org), we present trends in lifespan differential over several decades for a number of countries worldwide (UK and Netherlands included) and analyze them for common patterns. Examples of interplay between integrative and disintegrative political processes and trends in lifespan differential are presented. A formula connecting lifespan differential of a population with lifespan differentials of its subpopulations is introduced. This formula is applied to understanding of considerable growth of lifespan differential in Israel in period from 1990 to 2000 in terms of lifespan differential of immigrant population and lifespan differential in Israel prior this period.

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The power of context: An analysis of the data process in measuring women's empowerment in Ghana
Joe Strong, London School of Economics

How is women's empowerment represented by GDHS data? How are questions on women's empowerment perceived by female respondents? Are questions on women's empowerment relevant to women in Ghana? Methods: A multi-method strategy to generate qualitative evidence that was analysed using a thematic, theoretical approach. 1) A critical review of the indicators used in GDHS to measure women's empowerment; 2) an analysis of the chain of GDHS funding and reporting; 3) 27 in-depth interviews with data collectors from the Ghana Statistical Service, with the inclusion criteria that they must have worked on at least the most recent DHS survey (2014), and data users from women-focused organisations, including the government Department of Gender. Results: Data on women's empowerment are used iteratively by the same agencies who fund the data, resulting in a closed chain of evidence production and consumption. Data collectors can provide insights into the quality of data collected and respondents' experiences in surveys. Data collectors can be involved in negotiating answers and defining women's empowerment with survey respondents. Data are inadequate to represent the heterogeneity and context of women's experiences in Ghana, in particular, the different lineage systems, socio-cultural norms and ethno-linguistic groups. Data users perceive data on women weak and certain measures, for example freedom of movement, to inaccurately reflect the problems limiting Ghanaian women's empowerment. These results can be applied not only at the level of data collection and survey design, but also in broader policy prioritisation amongst large funding bodies.

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Marriage in conflict: A quasi-experimental study of the effect of armed conflict on union formation
Orsola Torrisi, London School of Economics

As compared to the mortality and migration arenas, the effects of conflict on marriage have not been researched extensively. The few studies investigating conflict impacts on marital decisions widely overlook armed conflicts occurred in the ex-Soviet territories and rarely adopt a causal inference approach. This ongoing work seeks to combine unique georeferenced data on conflict events and deaths with individual and household data to examine the impact of armed conflict on entry into marriage in Azerbaijan and Tajikistan. Specifically, retrospective longitudinal data on women's marital histories and information on age at marriage are obtained from the pooled 1999, 2003 and 2007 Tajikistan Living Standard

Surveys and the 2006 Azerbaijan Demographic and Health Survey. Information on conflict intensity are obtained from the Uppsala Peace and Conflict Database Georeferenced Event Dataset (UCDP-GED) (Version 17.2 2016). Such data are used to compare, in a difference-in-difference framework, entry into marriage of conflict-affected women who were of core marriageable ages during key conflict years to women who were reasonably safe during conflict and women who are expected to have made marital decisions before or long after conflict onset and end. Conflict-affected women are identified by linking georeferenced conflict information to survey data using techniques of spatial analysis as well as using self-reported information on IDP/refugee status in Azerbaijan and data on household dwelling damage in Tajikistan to reduce measurement error. Analyses are also stratified by migration status during conflict years

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Labour market outcomes of workless young people in England and Wales Longitudinal Study
Wei Xun, C. Marshall, R. Lacey, S. Jivraj, N. Shelton; University College London

Worklessness at early stages in the life-course may have long-term effects on health status in later life, through the accumulation of socio-economic disadvantage. This study follows a 1% sample of the England and Wales census population aged 16-24, drawn at 1971 from the ONS Longitudinal Study, and explores their economic trajectories in a 40-year follow-up period by worklessness status at baseline. Gender-specific multinomial regression was used to explore the time-lag effects of previous economic activity states in determining "current" activities, adjusted using economic activity at 16-24 years, most recent economic activity status, age, education, marital status, health status, spouse working status, presence of household member with long-term illness, parental social class at baseline, and ward-level deprivation. The results show that in a large, representative, historical sample from E&W, worklessness at the age of 16-24 was found to inform economic activity status into mid- to late-life, after adjusting for the more recent states.

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Regional population change

Session organizer: Leo van Wissen (NIDI)

Monday 10 September 4.45pm

A comparison of sub-national population projections: A case study of the Thames Water region
Philip Rees, Stephen Clark, Pia Wohland, Michelle Kaalmandeeen; University of Leeds

Sub-national population projections play a significant role in allocation of national funding to local areas and in planning of local services, including water supply to domestic consumers. Thames Water Utilities Limited (TWUL) supplies water to over 9 million people in Southern England and prepares long-term plans for water supply to cope with population growth, sustainability requirements and climate change. TWUL commissioned short-term projections from EDGE Analytics and long-term population projections from the University of Leeds as inputs to water demand forecasts. This paper compares the results of these commissioned projections and those by the Office for National Statistics and the Greater London Authority, to better understand and evaluate the alternative future populations. The paper compares the methods and assumptions used in the four sets of projections. There is a consensus about the future course of sub-national fertility and mortality but a range of views about the future impact of internal and international migration flows, in the face of uncertainty associated with Britain leaving the European Union (Brexit). However, the greatest differences were between the projections that built in ethnic heterogeneity and those that did not. Those areas with a high ethnic minority share of the population such as London or Slough were projected to grow much faster when a model using ethnic local sub-populations was used. This result has wider application to all areas in Britain and suggests that current official projections are under-estimating future population growth for areas with concentrations of minority ethnic group populations.

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Interregional migration in the Dutch Regional Demographic Forecast Model PEARL
Trond Husby[1], Andries de Jong[1], Dorien Manting[2]; [1]Netherlands Environmental Assessment Agency (PBL), [2]Netherlands Environmental Assessment Agency (PBL) and University of Amsterdam

The regional household forecasts of The Netherlands Environmental Assessment Agency (PBL) and Statistics Netherlands (CBS) works with a spatial interaction model to determine interregional migration flows between municipalities. Interregional migration is one of the main drivers behind regional population changes. Migration flows are modelled with a production-constrained gravity specification with housing stock as an independent variable. The regional population forecasts includes future developments of the Dutch population in each municipality, according to age, gender and household type. A key outcome of the previous population projection is that the population of the Netherlands will continue to grow over the next 15 years, but with large interregional differences: the population in the Randstad region (comprising the urban agglomerations of Amsterdam, The Hague, Rotterdam and Utrecht) is expected to grow significantly while other regions will experience population decline. In the presentation I will briefly present the demographic model PEARL and show some key outcomes from the previous six projections, focusing on the disparities between growing and declining regions. Next I will elaborate on the main drivers behind the outcomes, paying particular attention to interregional migration. Finally I will discuss ongoing work on interregional migration with the next projections, due in 2019.

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Development of population aging in the Functional Urban Areas in post-socialist countries on the example of Poland *Slawomir Kurek[1], Jadwiga Galka[2], MiroslawWojtowicz[1]; [1]Pedagogical University of Cracow, [2]Jagiellonian University in Krakow*

The aging of the population is one of the main demographic problems of European Union countries, including Poland. What's more, the demographic forecasts show that this process will intensify in the next decades. In Poland, the beginnings of this process date back to the 1990s, when, along with the political transformation, other manifestations of social and demographic transformation appeared. The economic crisis, structural unemployment, increased emigration of the population, change in the family model, and the decline in fertility are just some of the elements that make up the picture of Poland in the period of political transformation. The aim of the study is to identify the changes in population age structure at the beginning of 21st century. The subject of the study are Functional Urban Areas in Poland (151 cities and towns), including their core and outer zones according to the Concept of Urban Spatial Planning 2030. The functional urban area (FUA) is a spatially-resident settlement system consisting of separate administrative units (urban, rural and urban-rural municipalities), consisting of a compact urban area (core) and a functionally connected urban ring (outer zone). Existing research concentrates more on the rejuvenation of city centres due to gentrification. However some studies show that the influx of younger age groups to suburban areas will initially slow down the ageing of the population in those areas, but it will also increase this process in urban centres. The analysis is conducted with the use of basic measures of population ageing including ageing index, both static and dynamic. The typology of FUAs by their size and changes in age composition is shown. The discussion will focus on the role of functionally linked areas in the demographic changes against the rest of the country. It has been concluded that the degree of advancement of the aging process depends on the size of the given Functional Urban Areas and their functions. The largest FUAs showed deceleration or even reversal of population aging. Moreover, the differences in the age composition of population of cores and outer zones within FUAs gradually disappear as a result of suburbanisation processes.

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Population redistribution in times of population decline and ageing
Leo van Wissen[1], Kenneth Gopal[2], Michael Stuart Fox[2]; [1]Netherlands Interdisciplinary Demographic Institute NIDI, The Hague, and Faculty of Spatial Sciences, University of Groningen, [2]ABF Research Delft

What happens to urbanisation when population growth comes to an end, in combination with ageing? This paper studies the consequences of low natural growth and ageing for urbanisation patterns in the Netherlands in the 30-year period 1986-2015. We use a unique database of stocks and flows of population at the municipal level, which has been redefined to the administrative units of 2016. This solves a major issue in longitudinal analysis of spatial units when the definition of the administrative units, due to mergers, boundary changes etc. changes over time. Seven regions are defined, based on the dimensions core/periphery, and an urban/non-urban distinction within each zone. This definition allows us to look at concentration/deconcentration patterns in combination with urbanisation/suburbanisation/counter-urbanisation. We study changes in population distribution over these zones over time. The results indicate that urbanisation and suburbanisation have been dominant throughout the whole period for all age groups, but with a much stronger emphasis on urbanisation for the younger age groups over time. Deconcentration and counter-urbanisation flows are small and not increasing over time. These internal migration effects are reinforced by the differentiating effect of natural increase. Natural increase is positive and has increased in the largest cities whereas it is approaching zero or negative growth in the non-urban periphery and intermediary zone. Moreover, the outmigration propensity of the young from the non-urban periphery has increased by 50 per cent in the study period. This more than offsets the reducing effect on outmigration of a smaller population of young people in these areas.

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Residential relocations in a family context

Strand organizers: Clara Mulder (University of Groningen)

Tuesday 11 September 11.00am

Non-resident children as a constraint to migration: The role of re-partnering

Roselinde van der Wiel[1], Niels Kooiman[2]; [1]University of Groningen, Faculty of Spatial Sciences, Population Research Centre, [2]Statistics Netherlands

The spatial mobility of individuals in two-parent families with children is relatively low. The extent to which separation changes the (im)mobility of parents and under which post-separation circumstances remains unclear. Geographical proximity to non-resident children is a crucial enabling factor for sharing childcare responsibilities after separation and can therefore form a constraining factor for internal migration (within-country moves over a distance of at least 40 km). In this paper, we contrast the likelihood of internal migration among single or re-partnering parents who have non-resident children (living under or over 2 km away) with individuals in two-parent families, separating parents and single or re-partnering parents with co-resident children only. We use population register data from the Netherlands to perform event history analysis. We find that single parents with non-resident children living further away are more likely to migrate than individuals in two-parent families, while single parents with a non-resident child living nearby or with co-resident children only are about equally (un)likely to migrate. The likelihood of migration is estimated to be highest for separated parents who are re-partnering, also compared to parents who are separating. However, having a non-resident child living nearby lowers the likelihood of migration during the year of re-partnering. These patterns appear to be similar for men and women. The results suggest that the extent to which internal migration is constrained by having non-resident children living nearby after separation depends highly on whether the parent is single or re-partnering.

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The changing nature of home moves over the course of childhood

Tim Morris[1], Ludovica Gambaro[2], Heather Joshi[3]; [1]University of Bristol,[2] DIW Berlin, [3]UCL Institute of Education

Moving home is a common feature of family life, but the timing and consequences of moves can vary depending on the family context and the occurrence of life course events such as union formation and dissolution. This paper examines household moves involving children in the UK during their first 14 years (over 2001-2016). We assess the prevalence and nature of moves in relation to children's age and previous moving history, asking three research questions. First, did the probability of moving vary with children's age? Second, did life events differentially affect the probability of moving as children grew older? Third, did the probability of achieving home ownership through moving change as children grew older? We use data from all 6 waves of the Millennium Cohort Study, including all families who participated in at least two waves (n=17,300). Multilevel event history analysis treats moves as recurrent events to allow repeat mobility throughout the study period. Our results indicate that the probability of moving was highest from birth to age 3 (33%). There was a lower peak around age 11 (20%). Parents' partnership changes were positively associated with moves at all waves, and single motherhood particularly when children are older. We find a slight decline of moves into home ownership and a concomitant increase of moves into private renting. In sum, while home moves became less common across childhood, they also became more disadvantageous, with potential negative consequences for children's development

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It's about time: The interrelationship between partnership transitions, residential mobility and housing tenure
Julia Mikolai, Hill Kulu; University of St. Andrews

Union formation and dissolution are closely linked to residential mobility and housing changes. Previous studies have focused on the relationship between one family life event and residential changes and have assumed that family life events influence residential mobility. We study the interrelationship between union formation, union dissolution, and residential mobility to gain a better understanding of how partnership and housing trajectories evolve and interact in individuals' lives. We first investigate how the risk of a residential move changes over time since partnership changes. We then study how the risk of union formation (cohabitation or marriage) and union dissolution changes over time since a residential move. We disaggregate the results by tenure type of the destination housing. Combining data from the British Household Panel Survey and the Understanding Society study, we estimate multi-level simple and competing risks event history models. The risk of a move is highest during the first year of a partnership or following separation. It is the highest among separated women and the lowest among married individuals. Separated and cohabiting individuals are most likely to move to private renting whereas married people are most likely to move to homeownership. Most individuals move to cohabit rather than to marry. In addition, marriage formation is mostly related to moves to homeownership. Among those who moved to homeownership, the risk of a cohabitation as well as the risk of a marriage is high. Separation leads to elevated residential mobility and moves to privately and socially rented dwellings

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Moving towards family after union dissolution in the United States
Clara H. Mulder[1], Amy Spring[2], Michael J. Thomas[1], Thomas J. Cooke[3]; [1]University of Groningen, [2]Georgia State University, [3]University of Connecticut

A growing literature has addressed the migration and residential mobility of ex-partners after divorce or the dissolution of a cohabiting partnership. It has repeatedly been speculated that a considerable share of the moves of separated people might be directed towards family members & most likely parents, but potentially also other family members and towards otherwise familiar locations. However, although some previous evidence suggests that separated individuals are more likely to move towards parents than others, there is only little empirical work investigating the role of parents or other family members in the moving behaviour of separated people. In this paper, we investigate moves of separated people towards parents and siblings, both moving close to them and moving in with them, and towards locations in which the individual has lived before. We use longitudinal data from the Panel Study of Income Dynamics for the United States and multinomial logistic regressions models. We find that following a separation, individuals are less likely to engage in migration if they have parents living close by, especially mothers. Moreover, separated individuals with distant parents are more likely to migrate in order to move in with or move close to mothers or both parents than fathers. In the final version of the paper we also plan to include analyses of moves towards siblings and towards the county of birth.

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Telling the story in statistics

Strand organizers: Kirsty MacLachlan, Esther Roughsedge (National Records of Scotland)

Tuesday 11 September 11.00am

Area profiles for policy planners, using simple techniques
Ludi Simpson, University of Manchester

A research project often attempts to draw out synthesised conclusions from data for many areas. Printed reports can rarely display the data for individual areas, yet those areas are often where political decisions and services are designed. The presentation suggests a set of techniques that can be used to make accessible the data and conclusions for individual areas, using a successful example. Flexible access to area results on ethnic identity and inequalities was made available for a wide range of policy and research work after the 2011 census, drawing also on the results from the previous two censuses. The work focused on clear visualisation of tried and tested analyses to provide answers to common questions. The products were 4-page briefings, a book of extended analyses, and eight interactive area profilers on which this paper focuses (http://www.ethnicity.ac.uk/research/data-sources. The profilers are Excel files without programming, using only functions available to all researchers: drop-down lists, lookup functions, conditional formulae, conditional formatting, and appropriate charts. The presentation will focus on how the same techniques can be used by any researcher. While Excel has a set of technical functions relevant to this project, the experience suggests priorities and techniques which can also be used in other subject areas, and with other software. These include headline indicators and summary text conditional on the data. These are akin to a newspaper article's first paragraph, the whole profile being the article itself. The data themselves are included, providing a detailed third layer of access to the evidence.

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The evolution of ONS's website
Andrew Dudfield, Office for National Statistics

Statistics are important and ONS has an awful lot of them. These statistics help determine where hospitals get built; markets move on the outcomes of the numbers ONS publishes. They are a consistent reference point at times of conjecture and in doing so play a vital role in the broadest range of choices we each make. Making sure all of these statistics are open and easy to use is a mission for the entire organisation. Why open? Well, statistics need to be open because they are yours. They are funded by you and for you and it is our job to get them to all of you in the most appropriate way. How can they be easier to use? Within this we have identified three key user needs: allow our users to find and use data more easily; allow users to customise data; allow users to browse by geography. This presentation will focus on what this mean for users of ONS's website and offer an opportunity to feedback of the digital work of the organisation.

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Why ONS should go to the Pub
Johannes Hechler, Office for National Statistics

I have always loved open science events. Especially the ones in pubs like Pint of Science. The audience are interested, and presenters free to use human language. I always thought my employer (Office for National Statistics) should do this, to support our regional profile and recruitment. Last November I gave my first pub talk at the ESRC Festival of Social Sciences. I spoke about population ageing, and urged the audience to use freely available data over hearsay and to be wary of misrepresentation of statistics in the media. In this talk I will promote why these events are valuable for anyone in academia or producing data. I will present audience statistics and give my personal advice on how to prepare a talk. I will also show how many regular events already exist that just need speakers.

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The wedding cake approach
Rob Davies, CLOSER, the home of longitudinal research

Producers of original research, evidence synthesis, or statistics need to demonstrate the impact of their work, whether instrumental, conceptual, or capacity building. Communicating complex scientific evidence to policymakers presents a number of challenges. The process can often be messy, time-consuming and frustrating. Barriers often cited by policymakers to using research include lack of accessibility, poor presentation and communication. Relationships, networks, trust and timing are all important elements in getting your message across, but emotions and values also come into play. This session will discuss the complexity of policymaking and explore the importance of narrative and storytelling, focusing on the 'wedding cake' approach as a potential method. Drawing on academic literature, official reports and recent examples of how this approach has directly influenced policy, it will challenge the audience to think differently about how to communicate their research.

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Wednesday 12 September 11.30am

Ways of increasing the reach and impact of our demographic statistics
Esther Roughsedge, Kirsty MacLachlan; National Records of Scotland

At National Records of Scotland, we have tried a range of ways to reach a wider audience with our key messages. We have tried making our statistics more accessible by creating infographics, and made it easier for people to explore our data themselves by creating interactive data visualisations. We have created quizzes and increased our use of social media to reach a wider audience. We have also put together a presentation on 'How is Scotland's population changing and what are the implications?', and we are giving different versions of this to a range of audiences. We do all of this with a very small budget and software which is free or widely available. We will give an overview of what we are doing and tips for people interested in doing something similar.

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Using infographics as an effective, efficient and economical way to share your research findings
Sheena Fletcher, Glasgow Centre for Population Health

This will be a slide presentation presenting a case study about and learning from my experience of using infographics within the Glasgow Centre for Population Health's communications approach. The presentation will include examples of good practice and tips on how you can get started creating your own infographics using simple processes. Infographics make your key messages and data more eye-catching and easily shareable on social, digital and print media as well as making research findings more accessible, easier to promote and engaging for a wide audience.

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Understanding the composition of international migration flows and its trend over time
Beata Nowok, University of Edinburgh

The size and composition of international migration flows are hotly debated in many countries but many misconceptions prevail. A long-term migrant is a person who moves to a country for at least a year, so nationals returning from living abroad are also counted as migrants, which is often not realised by the public. We use ternary plots to facilitate compositional analysis of migration flows, where composition is represented by proportions. Ternary plots allow us to display migration flows grouped into three categories which comes very useful in the European context when migrants are usually classified as nationals of a reporting country, (other) EU nationals and non-EU nationals. We use this example for immigration and emigration flows in the 28 European Union Member States (EU-28) over the period 1998-2015. Since such plots are not commonly used in public discourse, simple interpretation guidelines have been set out along with an

interactive web application developed using R package shiny (available at https://bnowok.shinyapps.io/eumigration/). Data can be plotted for multiple states simultaneously, which allows users to identify similarities and differences in migration patterns. Developments over time can be followed easily with the animation feature. Besides, the impact of the entry of new countries to the EU can be assessed by comparing data referring to the EU composition with 28 Member States (as from 1.07.2013) with those referring to the EU composition of the reference period. The largest enlargement of the EU in 2004 is emphasized by colour change. The ternary graph uses also the area of a circle to depict the size of migration flows.

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Training sessions:

Introduction to handling large datasets in *R*: a dive into internal migration data – Tuesday 11 September 1.30pm.

Trainer: Wil Tonkiss (Greater London Authority)

As demographers we often have access to very large datasets covering entire populations in great detail and spanning many years. However, in the past our ability to analyse, use and work with such data has been constrained by software limitations and processing speeds. Over the last five years the statistical programming language R, and the RStudio user interface, have become the tools of choice for statisticians of all types working with, and seeking to gain understanding from, large datasets.

This training session provides and introduction to R and RStudio and demonstrates how they can be used to manage and analyse larger datasets. The data used is the ONS detailed internal migration series estimates for 2017, which provide origin-destination information by single-year-of-age and sex for local authorities in England and Wales.

The flexibility of R means that there is usually more than one way to approach an analytical exercise. This session will follow Hadley Wickham's tidyverse principles and the suite of packages he has developed for wrangling and visualising data.

What will you learn?

Reading data into R and saving outputs

The concept and importance of 'tidy data'

Data manipulation and analysis using tidyverse packages

Data visualisation using ggplot2

The tools and tips that you take away will be applicable to any datasets that you currently work with and wil enable you to get started on your own analysis in R.

We will provide a list of useful resources that will assist in your ongoing education in R.

Who is running the session?

Wil Tonkiss is a Senior Research and Statistical Analyst at the Greater London Authority. He is responsible for developing and maintaining the GLA's suite of demographic models (which are implemented in R) as well as working on bespoke analysis and research projects alongside policy teams and stakeholders.

How will the session work?

The session will be very hands-on with attendees writing and running their own code. We will start with the basics but quickly move to practical real-world examples of how to analyse and manage data in R. Experience of working with code or other statistical packages will be of benefit (e.g. SPSS, Python).

Early career mentoring – Tuesday 11 September 6.20pm

Organisers: Alina Pelikh (University of Essex) & Alyce Raybould (LSHTM)

At this year's conference, we are happy to announce an 'early career mentoring session', where young researchers will have the opportunity to speak with both academics and non-academics. The session will be on Tuesday 11th from 18:20 – 19:15.

The format this year will be in the style of a "world café"/ "speed-dating" session. Students in groups of 5 will circulate every 10 minutes round tables of 2/3 mentors. The following attendees have kindly agreed to take part:

Table 1: Consultants

- Piers Elias, Independent consultant and BSPS president

- Nahid Kamal, Founder of PopDev Consultancy

- Dominick Veasey, Director at Nexus Planning

Table 2: Local Government

- Ben Corr, Demography manager at the Greater London Authority

- Rebecca Jathoonia, Office for National Statistics

Table 3: Junior Academics

- Fran Darlington-Pollock, University of Liverpool

- Ben Wilson, Stockholm University

- Thijs Van den Broek, LSE

Table 4 and 5: Senior Academics

- Hill Kulu, University of St Andrews (TBC)

- Clara Mulder, University of Groningen

- Paul Norman, University of Leeds

- Rebecca Sear, LSHTM

- Wendy Sigle, LSE

- Athina Vlachantoni, University of Southampton

Each mentor will have just a few minutes to sum up their career path and take a few questions from the group of students, before the bell rings and the students circulate to the next table. Although there is not a lot of time to get into deep discussion, we hope that this will provide the students with a wide overview of possible career trajectories, and facilitate further discussion between themselves and the mentors throughout the remainder of the conference.

Introducing the three UK Census Longitudinal Studies – Wednesday 12 September 9.00am

Trainers: CeLSIUS Team, University College London

This training session is designed to introduce people unfamiliar with the analysis of longitudinal data and the unique social science that can be undertaken with microdata that tracks individuals over time, to the kinds of analyses that can be carried out.

The session will provide a general introduction to the UK national LSs. A brief talk will be followed by an opportunity for delegates to have a hands-on session to:

- explore which variables are held by each LS in the data dictionary and use test data;

- have help completing an application to use LS data;

- meet with Support Unit staff and discuss the development of new research projects

- get the chance to explore and process longitudinal data and visualise longitudinal transitions in R using the SYLLS Synthetic Longitudinal Study micro-datasets

No previous experience of microdata or statistical analysis techniques is required

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POPGROUP: How to create & compare demographic projections for local planning & estimate the children from new housing – Wednesday 12 September 11.00am

Trainer: Ludi Simpson (University of Manchester)

A repeat of the popular session in 2014, demonstrating the POPGROUP demographic software used as industry standard in UK local plans. It is also used for social and health care planning and other derived forecasts, for districts and for smaller areas.

In this session, participants will select any district in England, replicate the official population and household projections, run a standard labour force projection, and explore the demographic impact of building 1000 extra dwellings.

The software is free for the training session but covers its costs through licensing for academic, government and business use. It is owned by the Local Government Association.