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 Franke1, Hill Kulu2, Julia Mikola2; 1University of Munich, 2University 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 (ASDRs) 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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**Social support and social scarring: can family ties protect non-combatants from mass killings?**
Diego Alburez-Gutierrez, London School of Economics

Social support has protective effects in non-emergency settings. The same may be true for war-affected populations but data to evaluate this are generally unavailable. Support may be most important for non-combatants; particularly for victims of mass killings, who experience high direct and indirect conflict mortality. This paper explore the influence of family support on mortality during and after mass killings during the Guatemalan civil war. (1) Did the availability of family networks affect differential mortality during the 1982 mass killings? (2) Was the loss of family support associated with higher long-term mortality risks (1983-2015)? Longitudinal social network data (complete for the 1960-2015 period; N=3600) come from genealogical reconstructions with survivors of the mass killings. Descriptive, logit, and survival analysis are used to explore the effects of family availability (i.e. family support) on direct and long-term mortality. Results suggest that the availability of family support had a protective effect during and after the massacres. Family size predicted differential mortality during the mass killings. In the long-term, survivors with more relatives killed in the massacres were more likely to die earlier. The material and social support provided by relatives may determine survival in the adverse conditions of mortality crises. Social scarring, the destruction of the social fabric around an individual, may explain differential survival after a mortality crisis. This is the first study to provide evidence on the link between social support and mortality using data on the same population before, during, and after an event of extreme war mortality.

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**Patterns and risk factors for deaths from external causes in India: Analysis of nationally representative population-based Survey**
Nandita Saikia1, Moradhvaj, Jawaharlal, Domantas Jasilionis, Vladimir Shkolnikov; International Institute for Applied Systems Analysis, Austria, Jawaharlal Nehru University, 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, MIPIDR*

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 Wilson1, Yuejen Zhao2; 1Charles Darwin University, 2Northern Territory Department of Health

Background: The Indigenous population of Australia is highly disadvantaged across a spectrum of demographic and socio-economic indicators, 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 Evans1, Adrian Gallop2, Brian Ridsdale3; 1Office for National Statistics, 2Government Actuary’s Department, 3International 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 Spitzer¹, Daniela Weber²; ¹Wittgenstein Centre for Demography and Global Human Capital, ²Vienna 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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