Visualising mortality across time and space
Chaired by Jonathan Minton

Visualising variation in mortality rates across the life course and by sex, USA and comparator states, 1933–2010
Laura Vanderbloemen, Imperial College, London

Background: Previous research showed that younger adult males in the USA have, since the 1950s, died at a faster rate than females of the same age. In this paper, we quantify this difference, and explore possible explanations for the variations at different ages and in different years.

Methods: Using data from the Human Mortality Database (HMD), the number of additional male deaths per 10,000 female deaths was calculated for each year from 1933 to 2010, and for each year of age from 0 to 60 years, for the USA and a number of other countries for comparison. The data were explored visually using shaded contour plots.

Results: Gender differences in excess mortality have increased. Coming of age (between the ages of 15 and 25 years of age) is especially perilous for men relative to women now compared with the past in the USA; the visualisations highlight this change as important.

Conclusions: Sex differences in mortality risks at various ages are not static. While women in the USA may have an advantage when it comes to life expectancy today, their life expectancy has greatly increased since the 1930s. Just as young adulthood has been made safer for women through improved antenatal and childbirth practices, changes in public policy can make the social environment safer for men.

Are middle aged (45-54) White non-Hispanic women in the US really experiencing increasing mortality rates
Mark Green, University of Liverpool

A recent paper by Anne Case and Angus Deaton (2015) presented data suggesting that longstanding continual improvements in mortality rates for middle aged (45-54)
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White non-Hispanic persons in the US had reversed since 2005. The findings provoked considerable academic, policy and public debate. A series of blogs picked the analyses apart, indicating that the results were affected by aggregation bias. The effect accounted for increasing mortality rates for males, but did not for females. Our paper presents an alternative approach applying Lexis surfaces to avoid aggregation bias. By plotting single year mortality rates per year, we can visualise greater detail to explore the role played by age, period and cohort effects. Data for all-cause mortality and cause-specific mortality by single age band, sex and race for the period 1999 to 2014 were collected from the CDC WONDER database. We show evidence that not only supports the finding of increased mortality rates for White non-Hispanic females aged 45-54 since 2005, but also that all-cause mortality rates for Black non-Hispanic persons have, in contrast to White non-Hispanic persons, fallen. Our results also reveal wider insights into changes in mortality rates by external causes between racial groups following the 2008 Recession. There have been increases in White non-Hispanic male suicide rates for both those aged 45-54, and for those aged over 70. Drug-related deaths have increased for both White non-Hispanic males and females aged 45-54. Vehicle-related deaths have decreased sharply for each racial group during this period as well. Our findings have important implications for understanding inequalities in population health by racial group, and particularly new patterns that have emerged following the 2008 Recession.

Mortality Inequalities between Scotland, England & Wales, and the rest of Western Europe
Jonathan Minton, University of Glasgow

Background: Scotland has higher mortality rates than the rest of Western Europe (rWE), with more cardiovascular disease and cancer amongst older adults; and more alcohol- and drug-related deaths, suicide and violence amongst younger adults. Methods: We obtained sex, age and year specific all-cause mortality rates for Scotland and other populations, and explored differences in mortality both visually and numerically. Results: Scotland’s age-specific mortality has been higher than the rest of the UK (rUK) since 1950, and this gap has increased over time. Between the 1950s and 2000s, ‘excess deaths’ by age 80 per 100,000 population associated with living in
Scotland grew from 4482 to 7420 compared with rUK, and from 4342 to 9007 compared with rest of Western Europe (rWE). UK-wide mortality risk compared with rWE also increased, from 321 ‘excess deaths’ in the 1950s to 2301 in the 2000s. Cohorts born in the 1940s and 1950s throughout the UK, including Scotland, had lower mortality risk than comparable rWE populations, especially for males. Mortality rates were higher in Scotland than rUK and rWE amongst younger adults from the 1990s onwards suggesting an age-period interaction.

Conclusion: Worsening mortality amongst young adults over the last 30 years reversed a relative advantage evident for those born between 1950 and 1960. Compared with rWE, Scotland and rUK have followed similar trends but Scotland has started from a worse position and had worse working age period effects in the 1990s and 2000s.