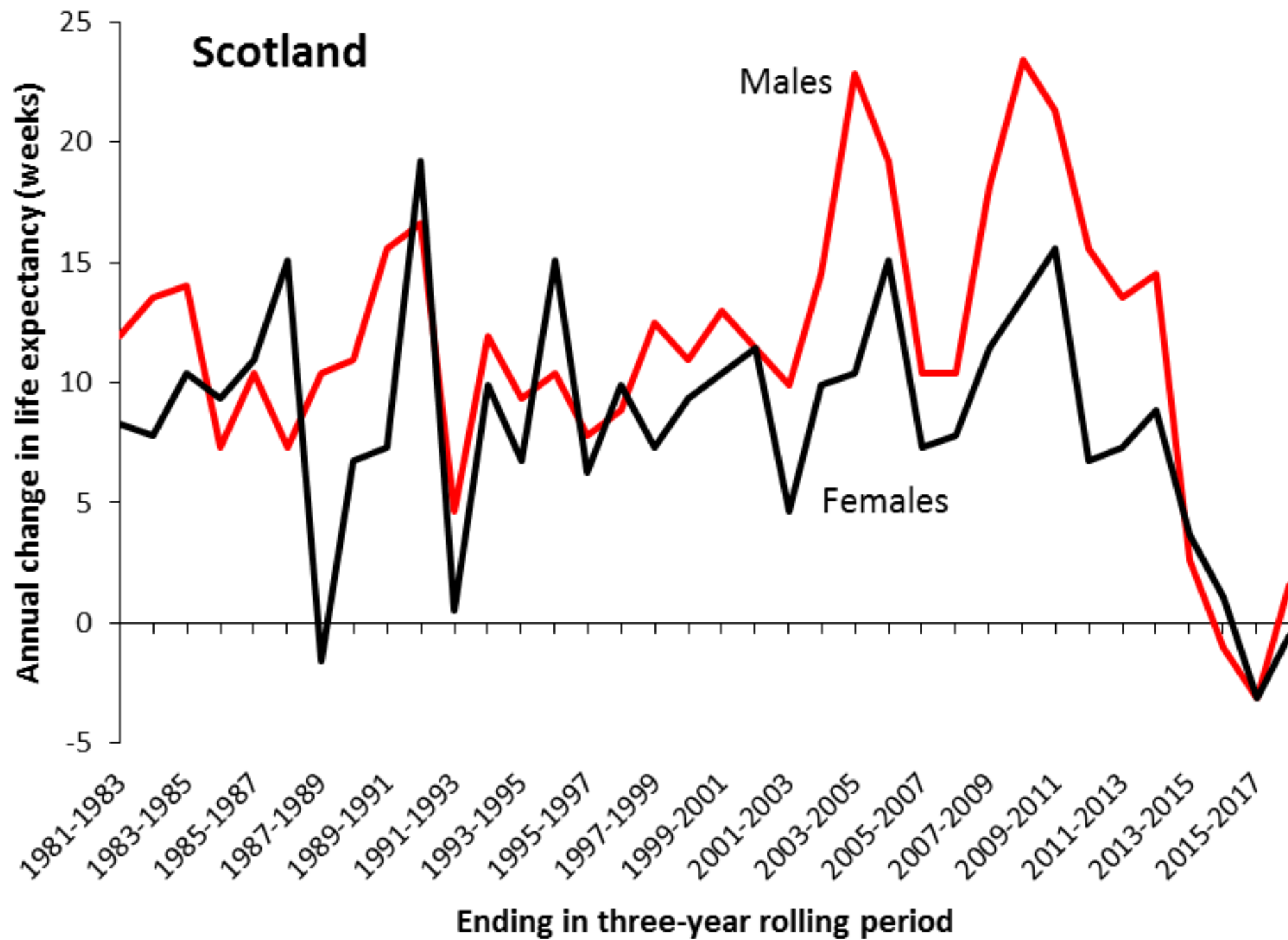
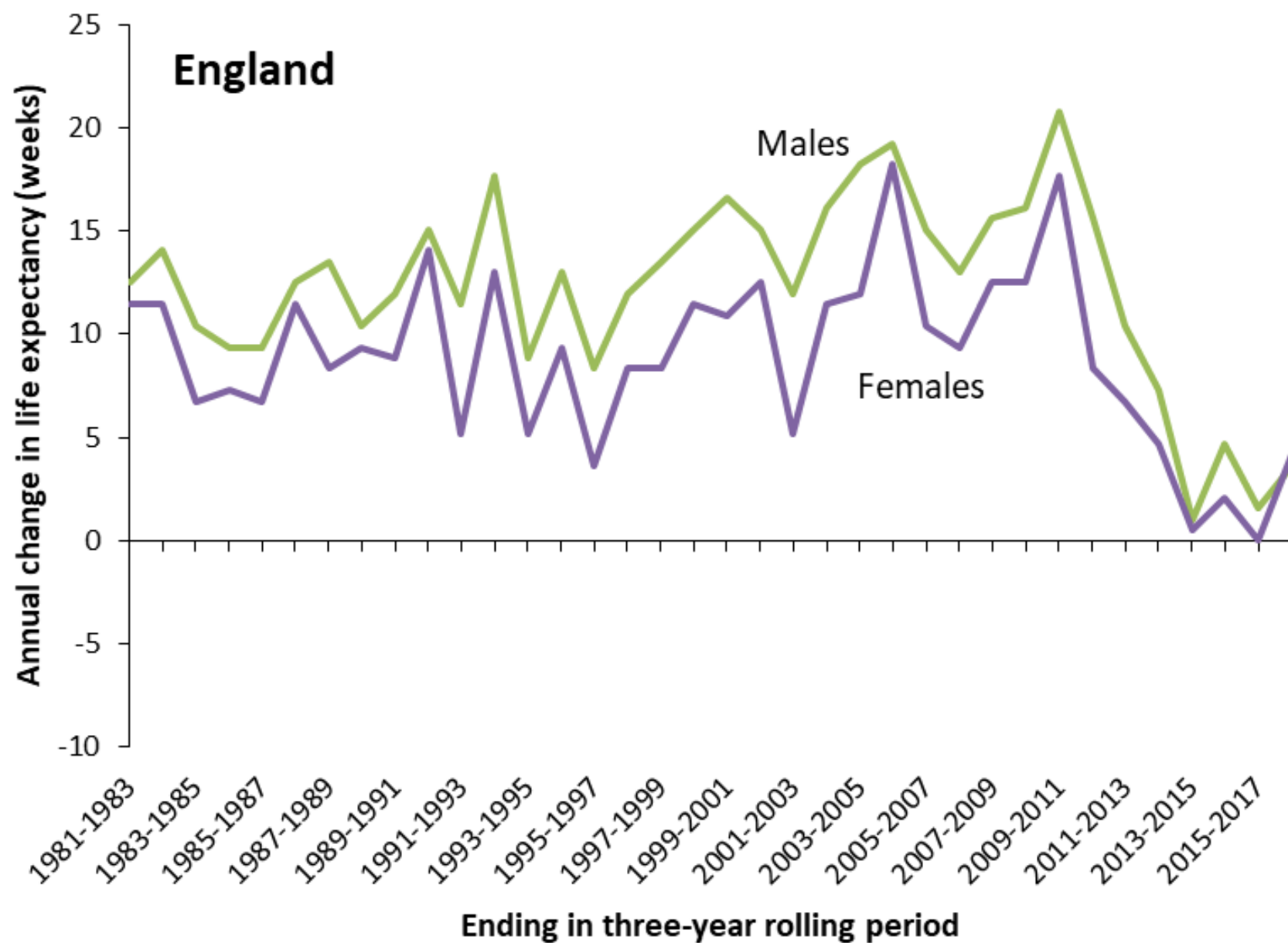


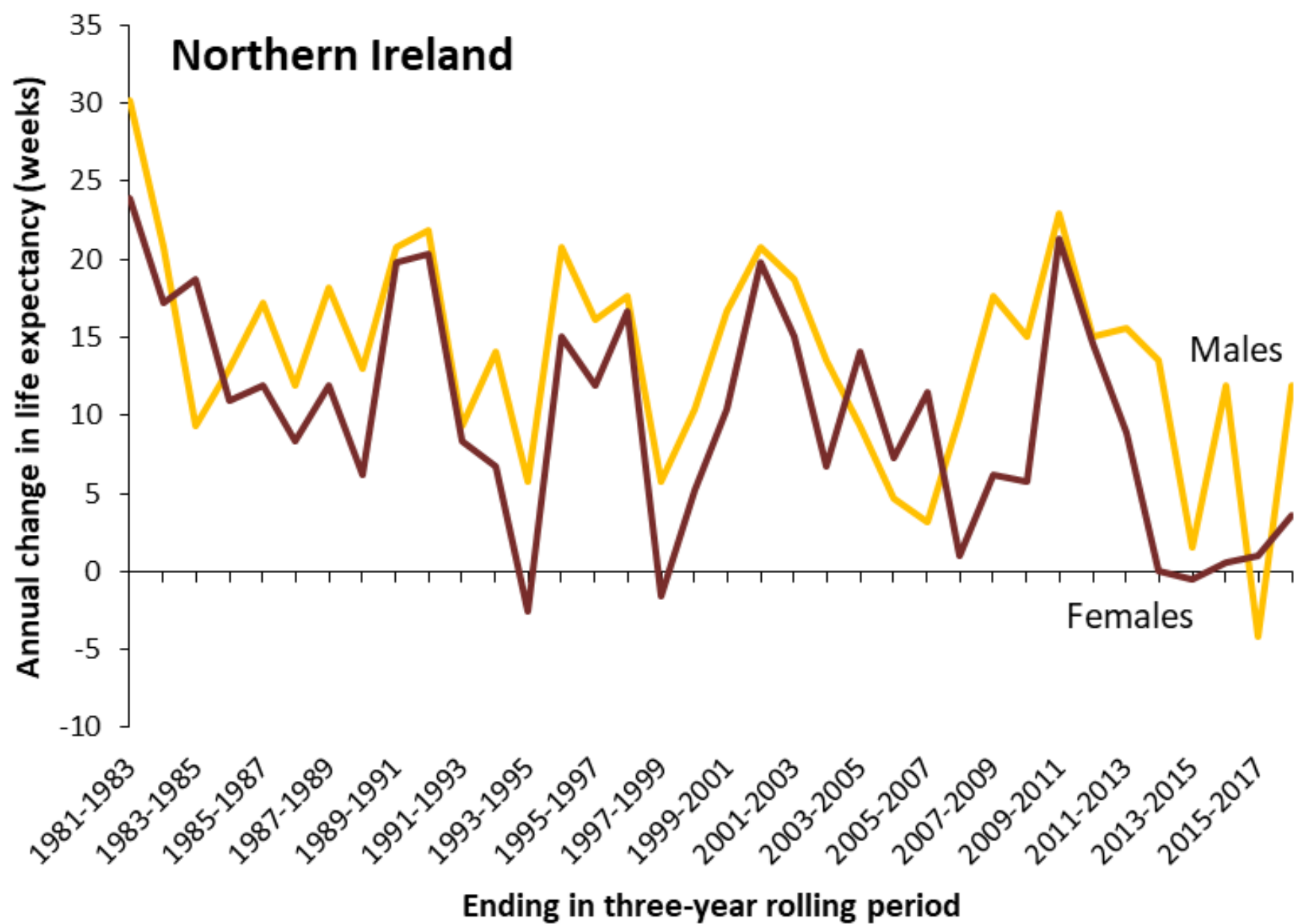
Increasing health inequalities and stalled improvements in life expectancy: naming the causes

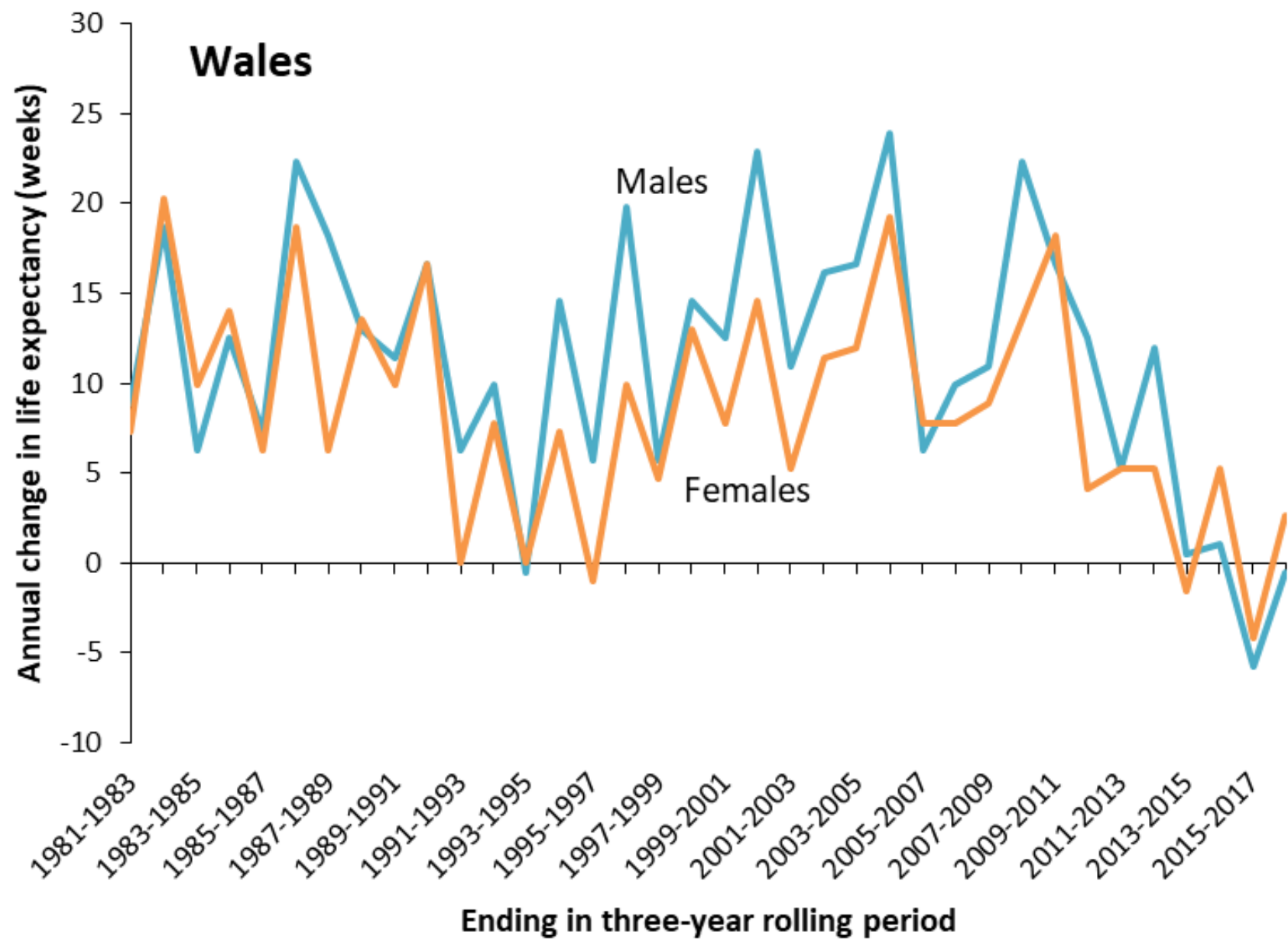
Gerry McCartney

May 2023

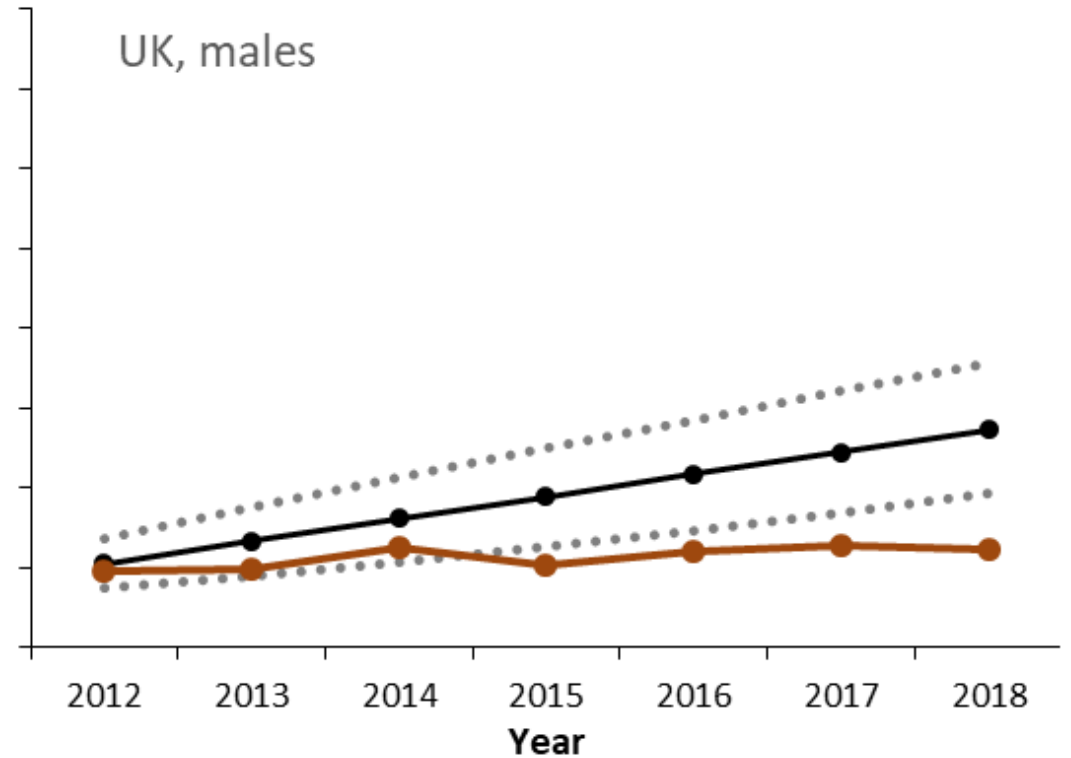
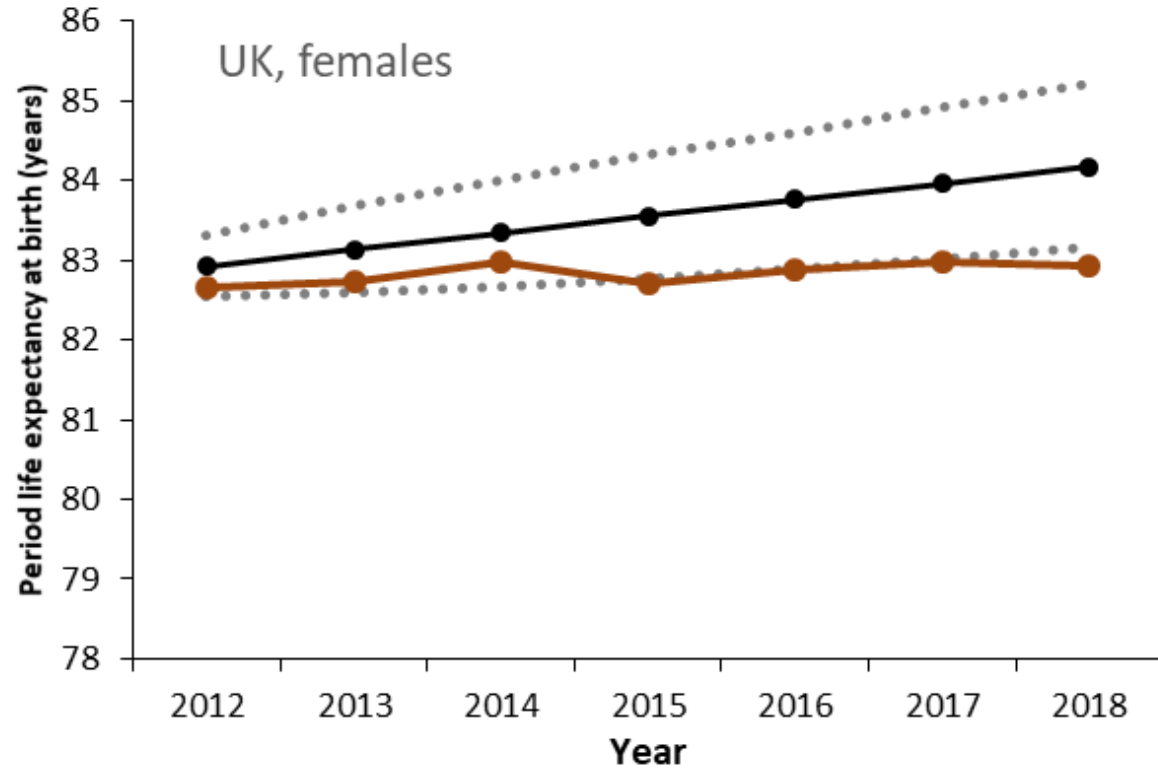




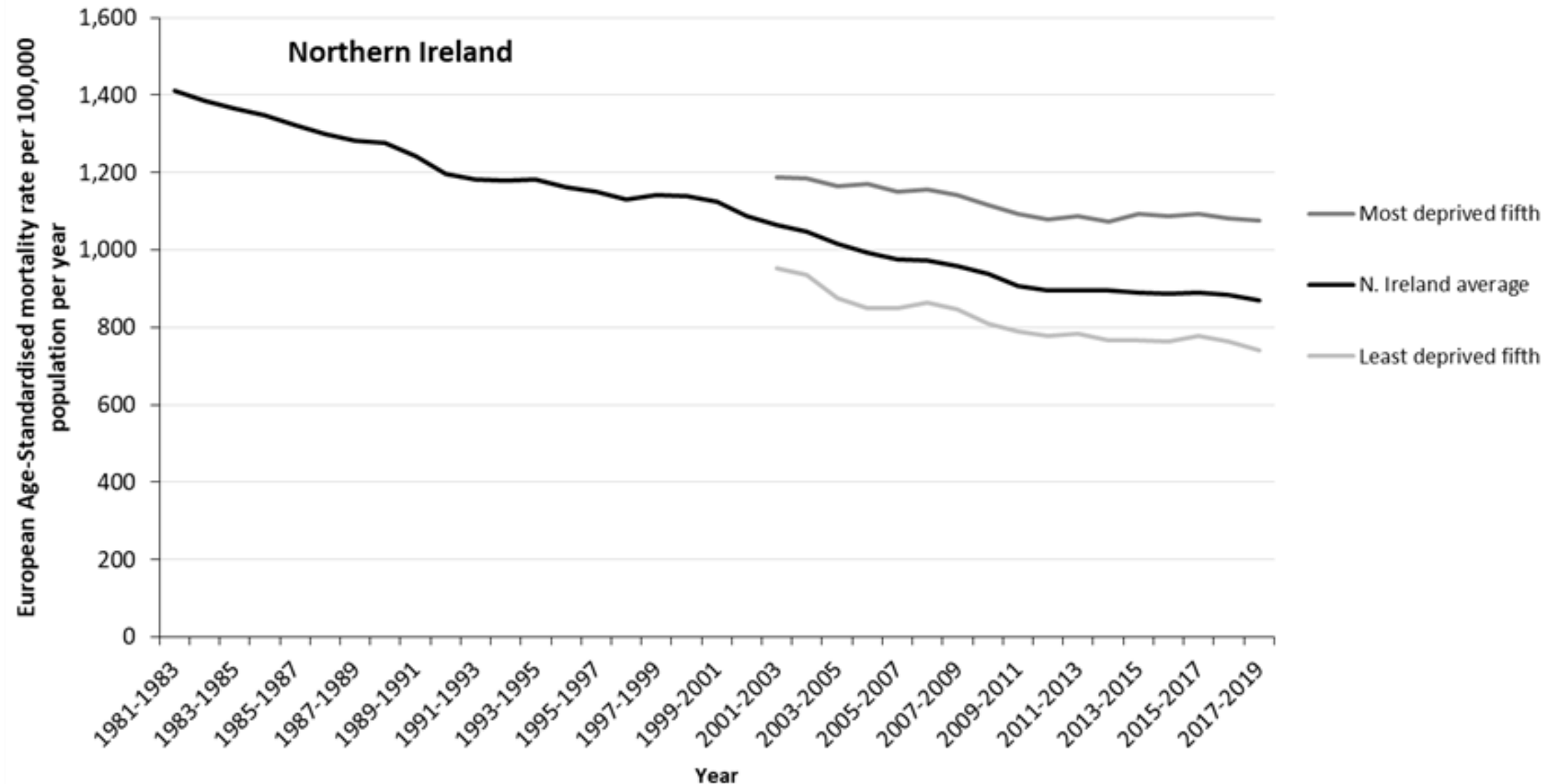




Actual versus projected life expectancy (based on the 1990-2011 baseline)

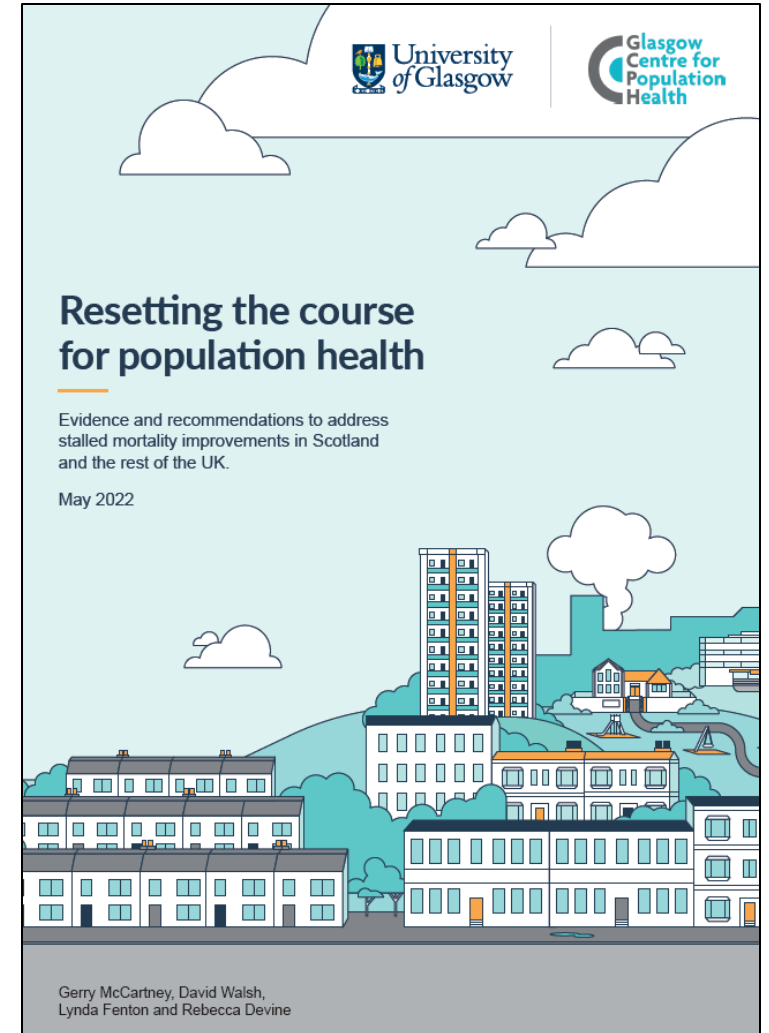


Inequalities in rolling three-year average European age-standardised mortality rates (by deprivation fifth), all ages and all causes, females (Source: updated version of analysis published in Walsh et al, 2020)




Causes of the stalled trends

- Austerity implemented across countries after around 2010
- Historical increases in obesity



Austerity: international level


- There was already a substantial body of evidence on the impacts of austerity when the various BMJ, PHE and HF reports were written in 2018 and 2019, but this was ignored
- Toffolutti showed a negative impact of austerity in the period up to 2013
- Rajmil showed a negative impact of austerity in 2011-2015, although the relationship wasn't linear
- Antonakakis looked at suicide mortality and again showed a relationship
- More recent analyses using panel regression models show austerity has large negative impacts across countries and time, especially if implemented during economic downturns



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Is austerity a cause of slower improvements in mortality in high-income countries? A panel analysis

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ABSTRACT

Background: The rate of improvement in mortality slowed across many high-income countries after 2010. Following the 2007-08 financial crisis, macroeconomic policy was dominated by austerity as countries attempted to address perceived problems of growing state debt and government budget deficits. This study estimates the impact of austerity on mortality trends for 37 high-income countries between 2000 and 2019.

Methods: We fitted a suite of fixed-effects panel regression models to mortality data (period life expectancy, age-standardised mortality rates (ASMRs), age-stratified mortality rates and lifespan variation). Austerity was measured using the Alesina-Ardagna Fiscal Index (AAFI), Cyclically-Adjusted Primary Balance (CAPB), real indexed Government Expenditure, and Public Social Spending as a % of GDP. Sensitivity analyses varied the lag times, and confined the panel to economic downturns and to non-oil-dominated economies.

Results: Slower improvements, or deteriorations, in life expectancy and mortality trends were seen in the majority of countries, with the worst trends in England & Wales, Estonia, Ireland, Scotland, Slovenia, and the USA, with generally worse trends for females than males. Austerity was implemented across all countries for at least some time when measured by AAFI and CAPB, and for many countries across all four measures (and particularly after 2010). Austerity adversely impacted life expectancy, ASMR, age-specific mortality and lifespan variation trends when measured with Government Expenditure, Public Social Spending and CAPB, but not with AAFI. However, when the dataset was restricted to periods of economic downturn and in economies not dominated by hydrocarbon production, all measures of austerity were found to reduce the rate of mortality improvement.

Interpretation: Stalled mortality trends and austerity are widespread phenomena across high-income countries. Austerity is likely to be a cause of stalled mortality trends. Governments should consider alternative economic policy approaches if these harmful population health impacts are to be avoided.

1. Background

The rate of improvement in mortality rates stalled across many high income countries around 2012, pre-dating the COVID-19 pandemic (Fenton et al., 2019a). The changed trends in the UK are evident for women and men, across almost all age groups, and for almost every specific cause of death, suggesting that the causes are impacting across multiple causal pathways simultaneously (Currie et al., 2021; Public Health England, 2018; Ramsay et al., 2020). The stalled average trends mask a rapid widening in health inequalities by deprivation in England & Wales (Rashid et al., 2021) and Scotland (Fenton et al., 2019b), and worsening mortality inequalities by ethnicity in the USA (Woolf et al., 2021), with mortality rates for people living in the most disadvantaged groups increasing (Fenton et al., 2019b; Rashid et al., 2021; Walsh et al., 2020; Woolf et al., 2021). The change in trends also been recorded in Iceland, the Netherlands, Portugal, France and Germany, among others (Fenton et al., 2019a; Ho and Hendi, 2018).

Many hypotheses have been proposed to explain the stalled mortality trends. Demographic and artefactual hypotheses (Murphy et al., 2019; Public Health England, 2018) can now be ruled out as substantive explanations (McCartney et al., 2022a). Although this stalling is due to a change in trends across almost all age groups and specific causes of death (Currie et al., 2021; Public Health England, 2018; Ramsay et al., 2020), the marked contribution some specific causes (cardiovascular

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Austerity: sub-national level

- Initial work by Watkins which associated cuts in social care with excess mortality
- Subsequent work in England is much more robust in demonstrating a relationship between reduced local authority budgets and excess mortality (e.g. Alexiou)

Local government funding and life expectancy in England: a longitudinal ecological study

Alexandros Alexiou, Katie Fahy, Kate Mason, Doreen Bennett, Heather Brown, Clare Bombra, David Taylor-Robinson, Benjamin Barr



Summary

Background Since 2010, large reductions in funding for local government services have been introduced in England. These reductions in funding have potentially led to reduced provision of health-promoting public services. We aimed to investigate whether areas that showed a greater decline in funding also had more adverse trends in life expectancy and premature mortality.

Methods In this longitudinal ecological study, we linked annual data from the Ministry of Housing, Communities, and Local Government on local government revenue expenditure and financing to 147 upper-tier local authorities in England between 2013 and 2017 with data from Public Health England, on male and female life expectancy at birth, male and female life expectancy at age 65 years, and premature (younger than 75 years) all-cause mortality rate for male and female individuals. Local authorities were excluded if their populations were too small or if changes in boundaries meant consistent data were not available. Using multivariable fixed-effects panel regression models, and controlling for local socioeconomic conditions, we estimated whether changes in local funding from 2013 were associated with changes in life expectancy and premature mortality. We included a set of alternative model specifications to test the robustness of our findings.

Findings Between 2013 and 2017, mean per-capita central funding to local governments decreased by 33% or £168 per person (range -£385 to £1). Each £100 reduction in annual per person funding was associated over the study period 2013–17 with an average decrease in life expectancy at birth of 1.3 months (95% CI 0.7–1.9) for male individuals and 1.2 months (0.7–1.7) for female individuals; for life expectancy at age 65 years, the results show a decrease of 0.8 months (0.3–1.3) for male individuals and 1.1 months (0.7–1.5) for female individuals. Funding reductions were greater in more deprived areas and these areas had the worst changes in life expectancy. We estimated that cuts in funding were associated with an increase in the gap in life expectancy between the most and least deprived quintiles by 3% for men and 4% for women. Overall reductions in funding during this period were associated with an additional 9600 deaths in people younger than 75 years in England (3800–15400), an increase of 1.25%.

Interpretation Our findings indicate that cuts in funding for local government might in part explain adverse trends in life expectancy. Given that more deprived areas showed greater reductions in funding, our analysis suggests that inequalities have widened. Since the pandemic, strategies to address these adverse trends in life expectancy and reduce health inequalities could prioritise reinvestment in funding for local government services, particularly within the most deprived areas of England.

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Introduction

Life expectancy in England has stalled. Although similar trends have been observed in many high-income countries since 2011, the situation in England is among the worst.¹ These adverse trends in life expectancy have disproportionately affected the most deprived areas, reversing improvements in inequalities accrued over the previous decade.²

The reasons for this plateauing remain unclear; that the population has reached its natural biological limits is unlikely, given that life expectancy in other countries is

higher and rising.³ Most reviews have pointed to multiple factors,^{4,5} including the timing of the smoking epidemic⁶ or cold weather and higher prevalence of influenza.⁷ These factors however do not explain the change in trend from 2011,⁸ or its persistence over several years. A growing number of studies have associated stalling life expectancy with reduced funding for public services following the introduction of austerity measures in England in 2010.^{9–11} These studies have largely focused on health and social care expenditure and have been based on relatively simple analyses comparing national trends

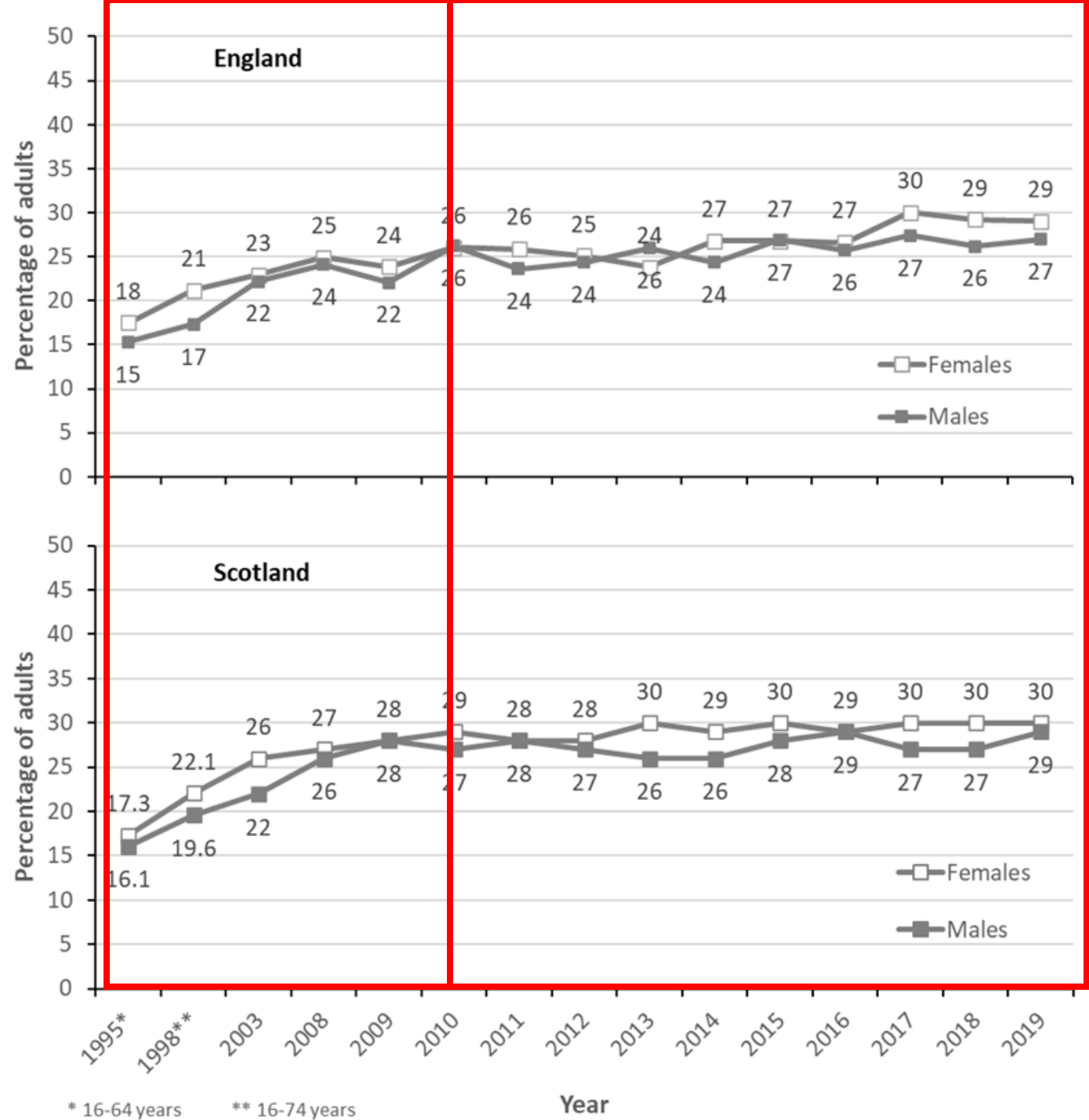
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Austerity policies

- Taken together there is consistent evidence that austerity has been an important contributing factor to the stalled trends
- Note that the international austerity measures show that most high income countries introduced austerity at various points (including Germany and USA), despite that being used as an argument against that as a cause
- Important as we emerge from the pandemic and there is a renewed narrative from the UK Government about 'living within our means'

Increased prevalence of obesity

Percentage of male and female adults classed as obese (BMI of 30+) in (a) Scotland and (b) England, 1995-2019. Adults are defined as aged 16 years and above apart from data for Scotland in 1995 (16-64 years) and 1998 (16-74 years). Sources: Health Survey for England and Scottish Health Survey

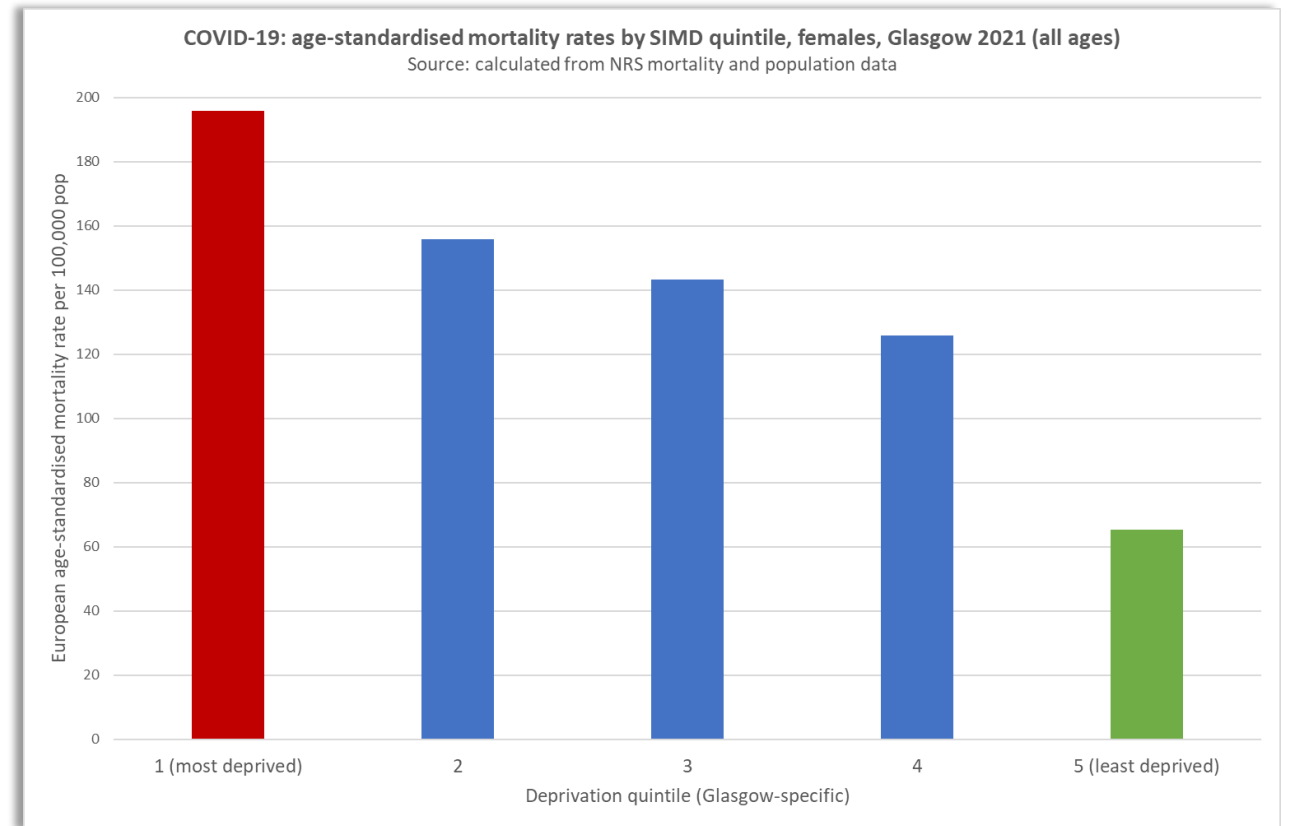


Increased prevalence of obesity

- Increased prevalence of obesity between 1995 and 2010, steadier since
- Obesity is linked to a wide range of cause-specific mortalities, and with a time lag
- Increased obesity in earlier period could theoretically be linked to increased subsequent mortality, especially with CVD
- Modelling of the contribution of the increase in obesity using PAF methods suggests that around 10% and 14% of the difference between actual and projected mortality in Scotland for men and women respectively could be explained
- Modelled contribution is 18% and 34% for men and women in England
- ...but lots of caveats and uncertainties
- Likely that obesity is making a contribution to the stalling

COVID-19

- These trends pre-date COVID-19 pandemic
- But are – obviously – massively important context for understanding the scale of pandemic inequalities



COVID-19

- The indirect impacts are also very important
- Unmet need for healthcare
- Economic and social consequences of infection control measures

- 523,000 deaths in the UK were predicted in the early days of Covid-19 if there was no lockdown imposed (the Imperial model)
- Lockdown was used, and so the actual number of Covid-19 deaths was much lower
- Health inequalities cause 6 TIMES as many deaths every decade as a completely unmitigated Covid-19 pandemic
- Yet, where is the political action commensurate with such a loss of life?

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Original research

Scaling COVID-19 against inequalities: should the policy response consistently match the mortality challenge?

Gerry McCartney ,¹ Alastair Leyland,² David Walsh ,³ Dundas Ruth ²

► Supplemental material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/jech-2020-214373>).

For numbered affiliations see end of article.

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ABSTRACT
Background The mortality impact of COVID-19 has thus far been described in terms of crude death counts. We aimed to calibrate the scale of the modelled mortality impact of COVID-19 using age-standardised mortality rates and life expectancy contribution against other, socially determined, causes of death in order to inform governments and the public.
Methods We compared mortality attributable to suicide, drug poisoning and socioeconomic inequality with estimates of mortality from an infectious disease model of COVID-19. We calculated age-standardised mortality rates and life expectancy contributions for the UK and its constituent nations.
Results Mortality from a fully unmitigated COVID-19 pandemic is estimated to be responsible for a negative life expectancy contribution of −5.96 years for the UK. This is reduced to −0.33 years in the fully mitigated scenario. The equivalent annual life expectancy contributions of suicide, drug poisoning and socioeconomic inequality-related deaths are −0.25, −0.20 and −3.51 years, respectively. The negative impact of fully unmitigated COVID-19 on life expectancy is therefore equivalent to 24 years of suicide deaths, 30 years of drug poisoning deaths and 1.7 years of inequality-related deaths for the UK.
Conclusion Fully mitigating COVID-19 is estimated to prevent a loss of 5.63 years of life expectancy for the UK. Over 10 years, there is a greater negative life expectancy contribution from inequality than around six unmitigated COVID-19 pandemics. To achieve long-term population health improvements it is therefore important to take this opportunity to introduce post-pandemic economic policies to 'build back better'.

BACKGROUND
The COVID-19 pandemic has been tracked by daily counting of cumulative numbers of confirmed cases and deaths.¹ The exponential growth in these numbers across countries has understandably created anxiety and action from public health agencies and governments internationally. Despite initial surveillance and reporting of COVID-19 following standard infectious disease epidemiologic methods, the subsequent reporting of COVID-19 mortality has largely focused on crude death counts, arguably not meeting the 'rigorous standardisation and quality control of investigative methods [that] are essential in epidemiology'.² A number of particular limitations in the data have prevented a sufficient understanding of the true impact of the pandemic on mortality.

First, the counting of cases of COVID-19 within and between countries has been dependent on the case definition and the changes in that over time. At the beginning of the outbreak in Wuhan, China, cases were defined clinically before virological testing was available. Then, as testing became partially available, cases were defined as people with a travel history from China, or contact with a known case, and a positive virology test. Then, cases were defined as people with a positive virology test irrespective of symptoms or history, although the availability of tests remained restricted.³ This is problematic for epidemiological surveillance, because limited availability of testing, and the self-limiting nature of the infection for many, meant that the case count underestimated the true incidence within the population. For COVID-19 deaths, the count was initially based on people who died within hospital who had a positive virological test. This is subsequently being extended in most countries to include coding of deaths based on clinical opinion in all settings. This raises a further issue because many deaths will occur in people who die with, rather than die of, COVID-19.

Deaths occur every day, and simply reporting the cumulative number of deaths for any particular cause, be that COVID-19 or anything else, will always reveal a rising trend. Other causes of death are not reported in this way. It is therefore difficult for the public and policymakers to understand how to interpret and compare these to other causes of death.

The COVID-19 deaths reported are crude death counts. They therefore do not take into account the size of the population at risk (as a crude rate does), nor the age and sex structure of the population, in particular, how old the population is (as an age-sex-standardised rate does). In contrast, other causes of death such as cancers and heart disease, and deaths attributable to deprivation, poverty and other political and socioeconomic causes such as austerity are usually measured as differences in such standardised rates, in Years of Life Lost (YLL), or life expectancy contributions.⁴ Finally, the reported crude death counts also do not account for competing causes and how likely people dying from COVID-19 were to have died relatively soon from other causes.⁵ It is therefore difficult to assess the scale of the mortality risk of COVID-19 relative to the background mortality risk in the population.

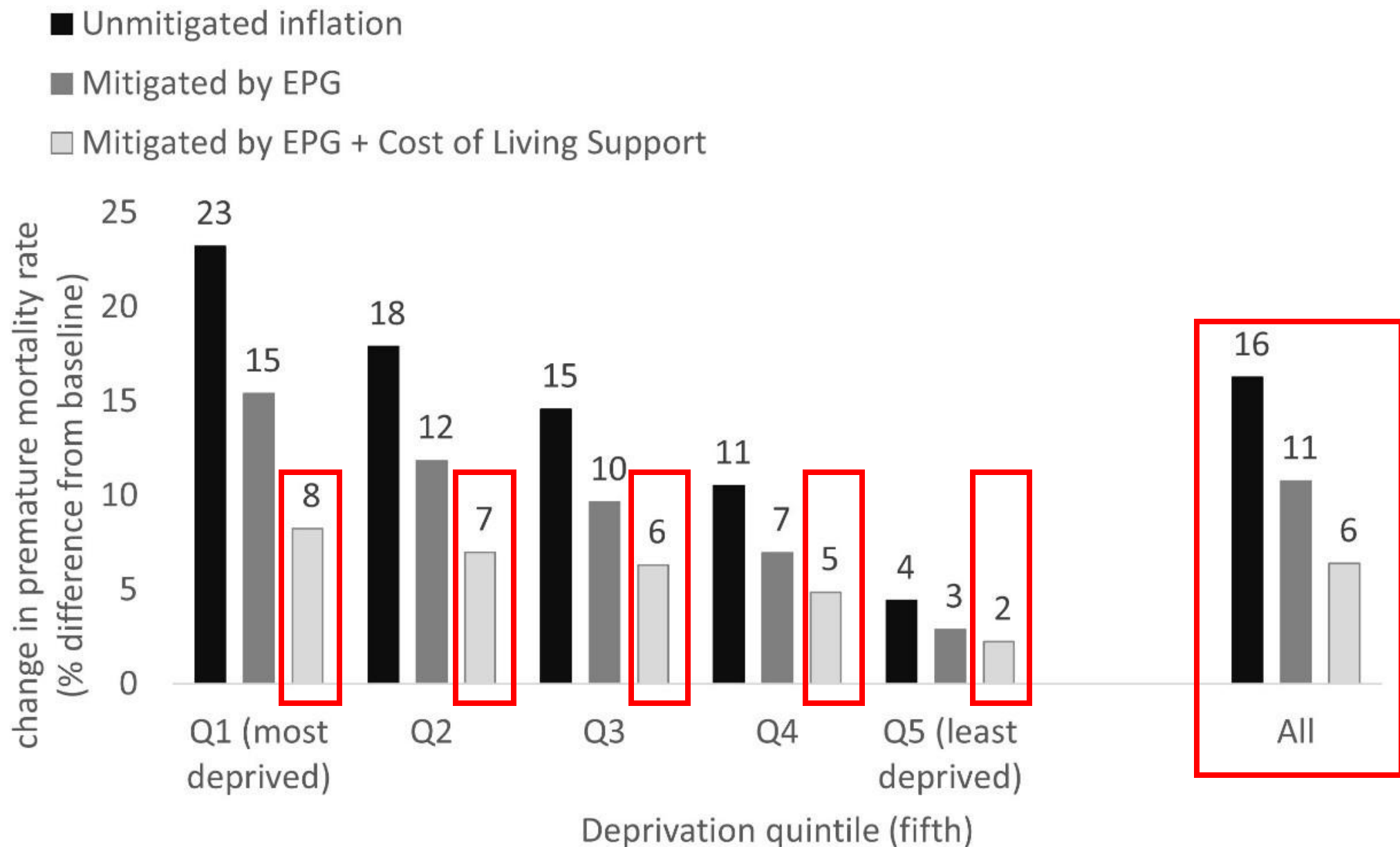
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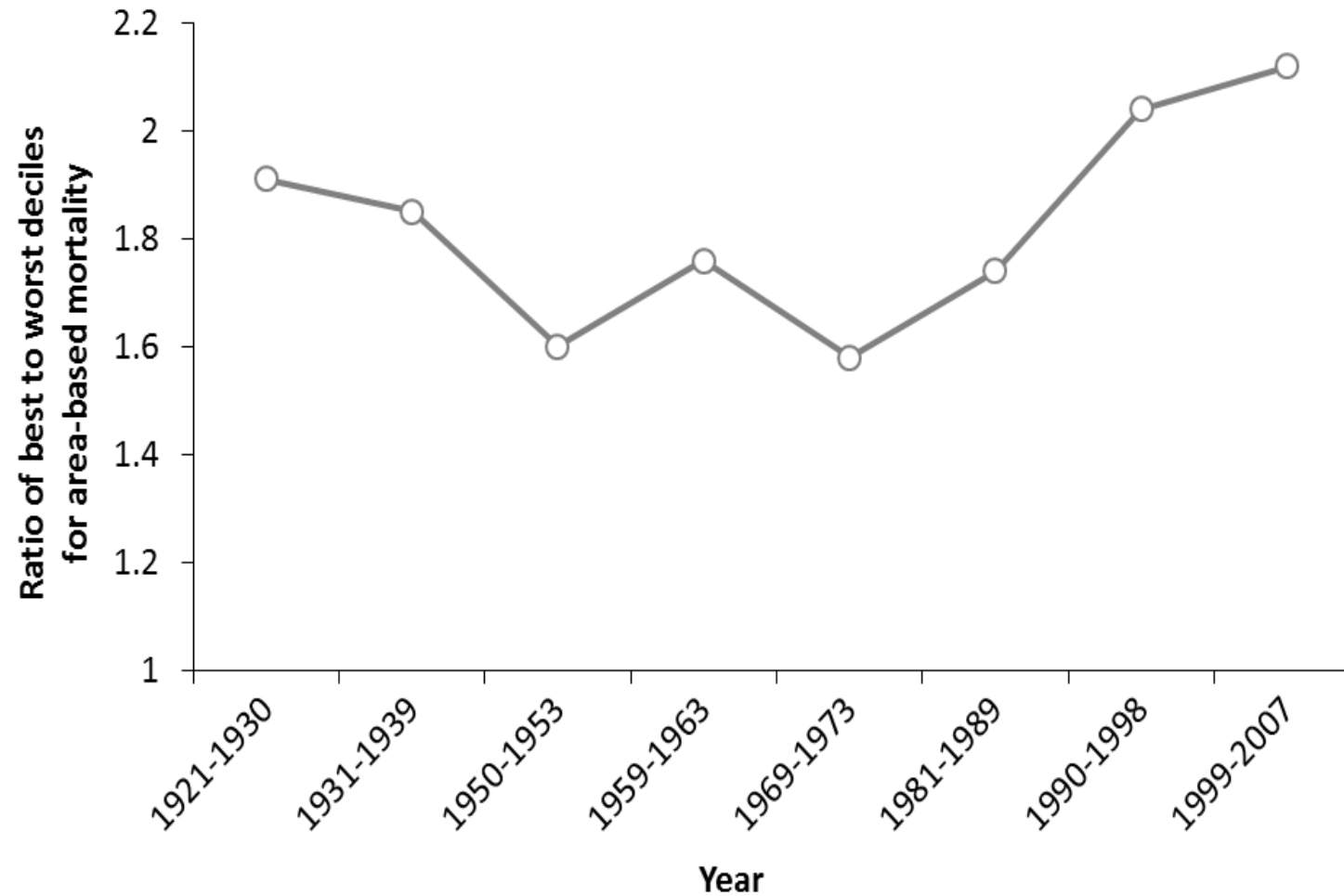
Impacts of inflation

- We used an existing policy simulation tool (Triple I) to estimate the impacts of inflation on mortality in Scotland
- The estimated impacts are large, even when mitigated by the Energy Price Guarantee and other measures seeking to reduce the costs of living

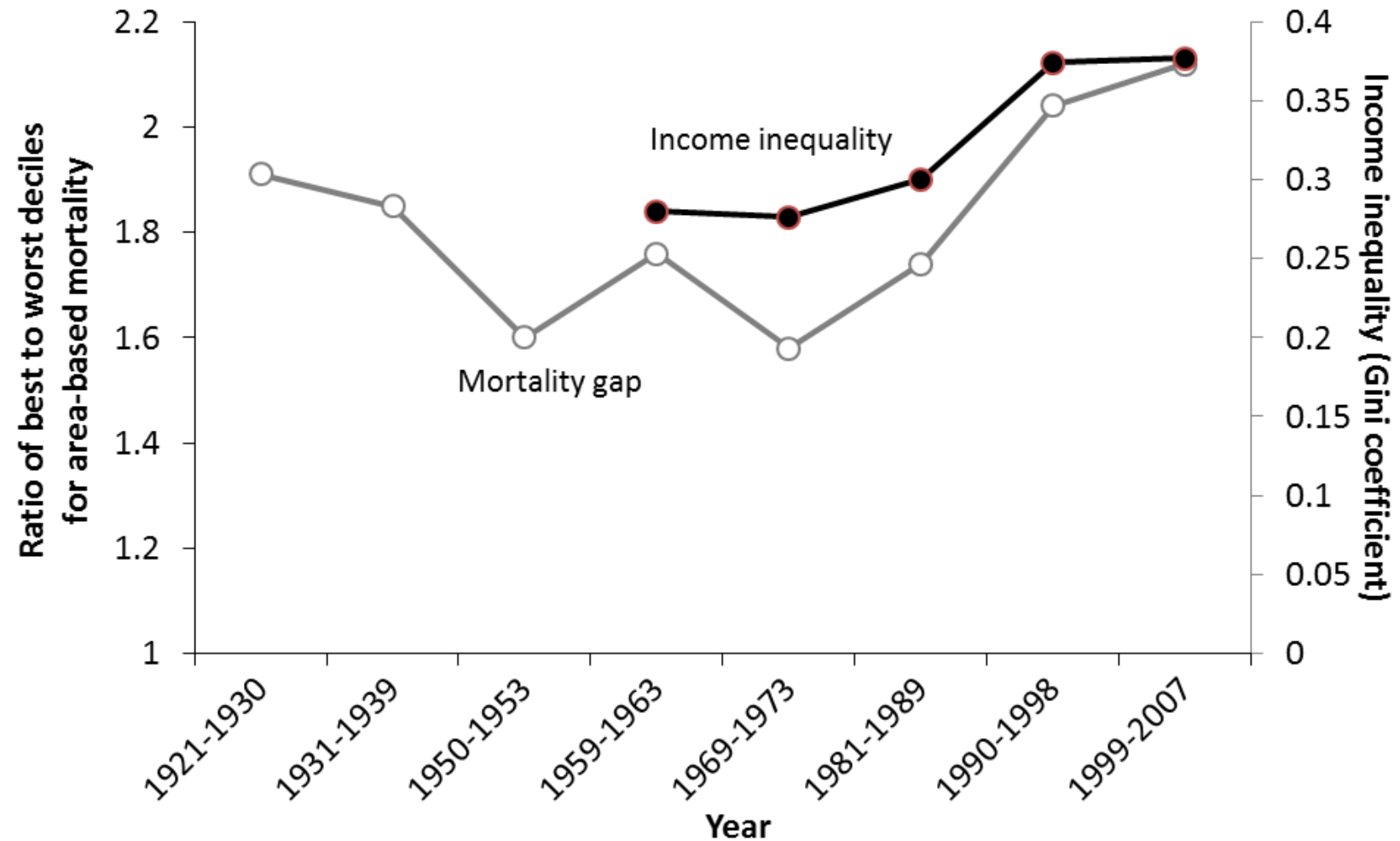


Health inequalities: a long-term view

Inequality in mortality between best and worst 10% of local authorities in Great Britain (sources: Thomas 2010 and Luxembourg Income Study)



Inequality in mortality between best and worst 10% of local authorities in Great Britain (sources: Thomas 2010 and Luxembourg Income Study)



Conclusions

- Health inequalities are caused by inequalities in income, wealth and power
- Austerity since 2010 has cut incomes and public services, particularly for those in the most deprived circumstances
- Covid-19 exposed these underlying inequalities in society
- Inflation is once again exacerbating income inequalities
- Be wary of reports, analyses and interventions suggesting they will reduce inequalities if they don't address these fundamental causes

- Links to recent report and animation: www.gcph.co.uk/life-expectancy
- Email: gerard.mccartney@glasgow.ac.uk