

MORTALITY TRENDS IN CARDIOVASCULAR DISEASE: A NEW MODEL TO VISUALISE THE CONTRIBUTION OF SPECIFIC DISEASES, COHORT EFFECTS AND CODING CHANGES TO OVERALL MORTALITY IMPROVEMENT.

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Objectives

Identifying the drivers of trends in mortality for disease classes is challenging. We used the *Requiem* model to visualise trends by gender and age in 3-D format to identify cohort effects, impacts of interventions and mortality coding changes in specific cardiovascular diseases (CVD).

Methods

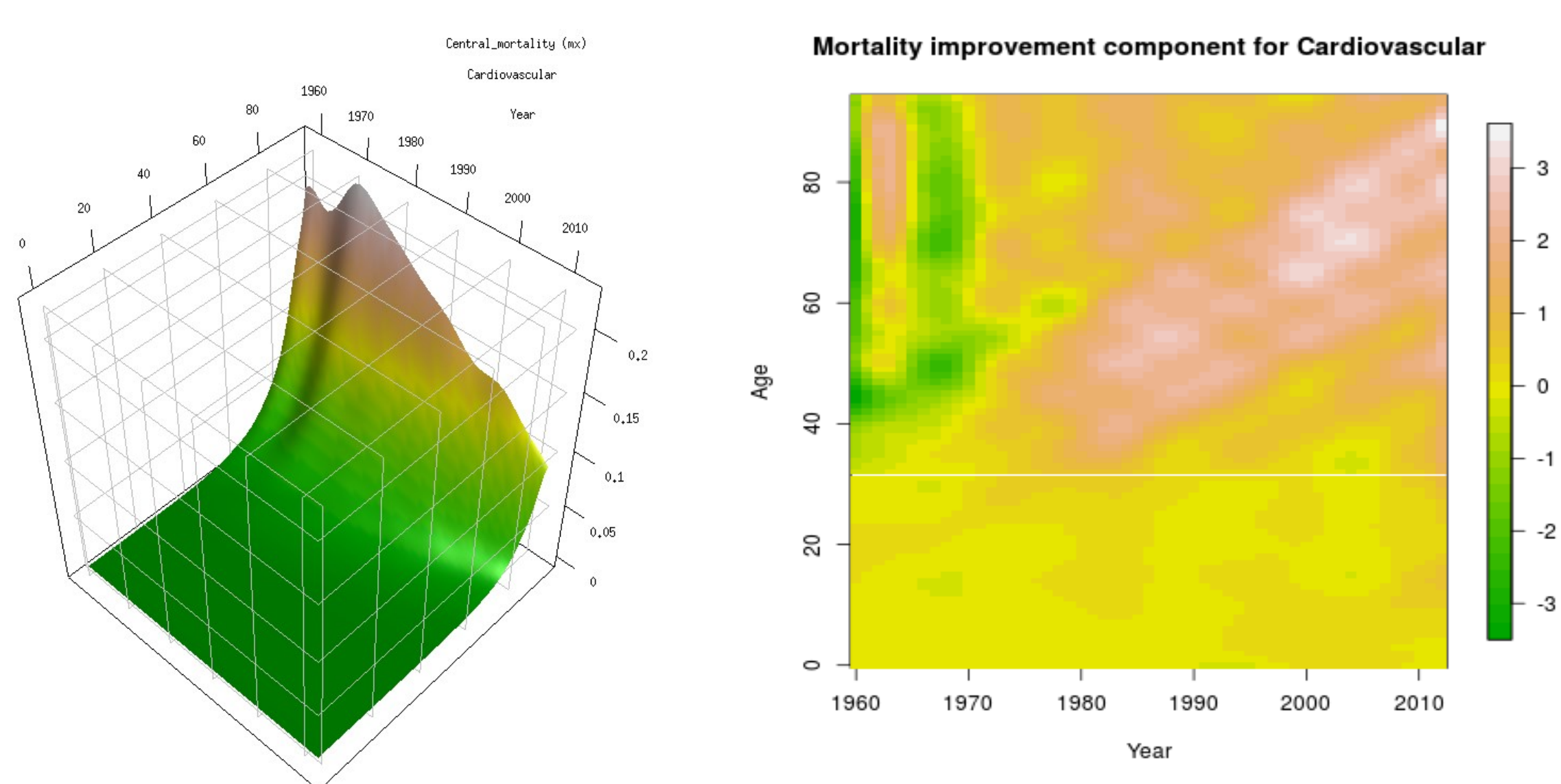
The *Requiem* model analysed and smoothed ONS mortality statistics for England and Wales from 1970 to 2013 by single year of age and gender. Disease codes were mapped at 4-digit level from ICD-8 to ICD-10 by medical modellers. An analysis was run for all CVD and individual diseases within that category. Outputs were displayed in multiple formats, including 3-D images of central mortality and deaths by age over time, and heat maps of absolute mortality improvement per disease and the component each disease contributed to all-cause mortality trends.

Results

CVD mortality has declined by up to 8% per year in England and Wales, especially in the “golden cohort” born in the 1930s, as shown clearly in the heat maps. Mortality rates from ischaemic stroke have fallen precipitously by up to 10% per year in both genders, especially in the 80+ age group, as shown in the 3-D charts. This contributed up to 0.4% absolute improvement in all-cause mortality prior to 1990. Mortality improvement from myocardial infarction was up to 20% per year in both genders aged 40 to 80, especially in the mid-1980s to 1990s, contributing up to 2% in absolute improvement in all-cause mortality in men in the mid-1980s and 1% in women in the early 1990s.

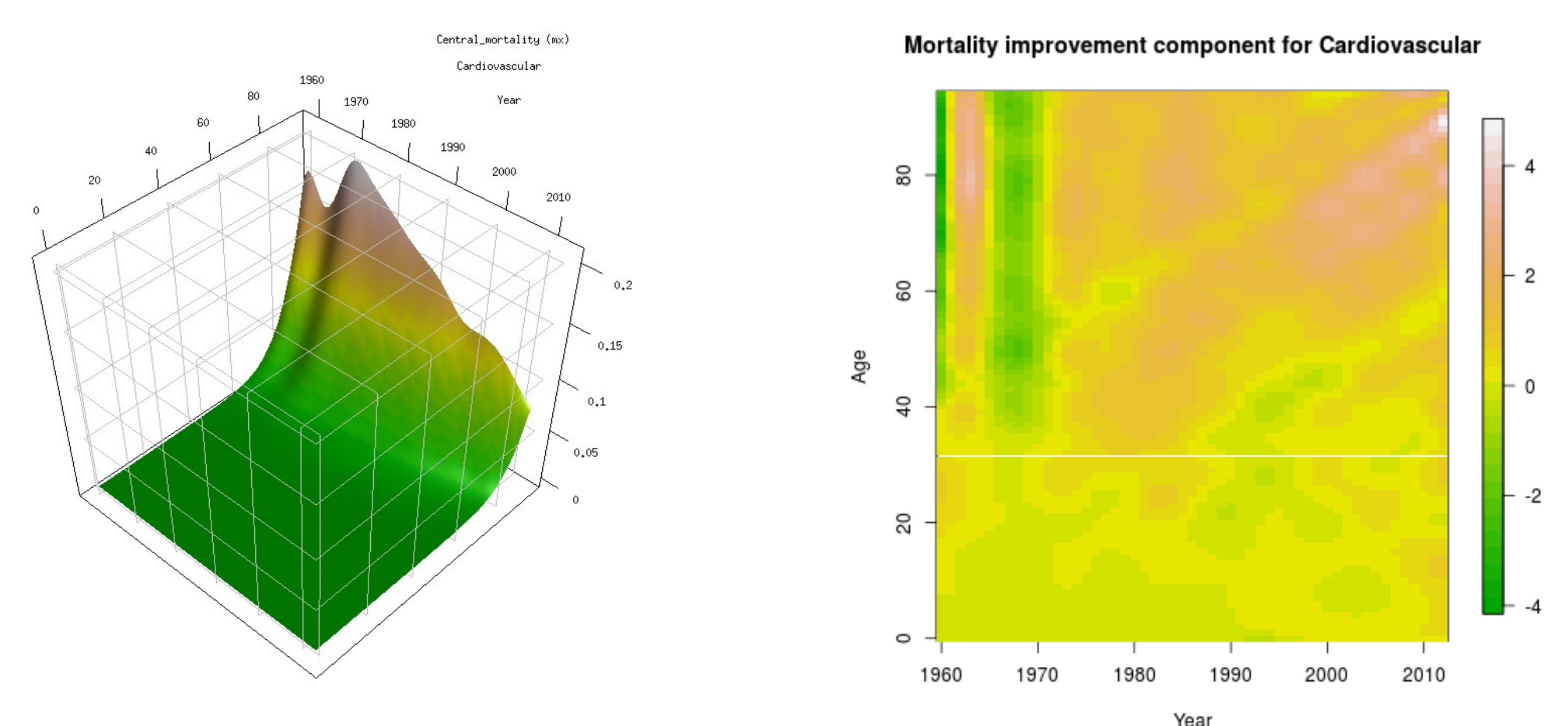
Men: CVD mortality trends, England and Wales, 1970-2013

Central mortality and mortality improvement component heatmap



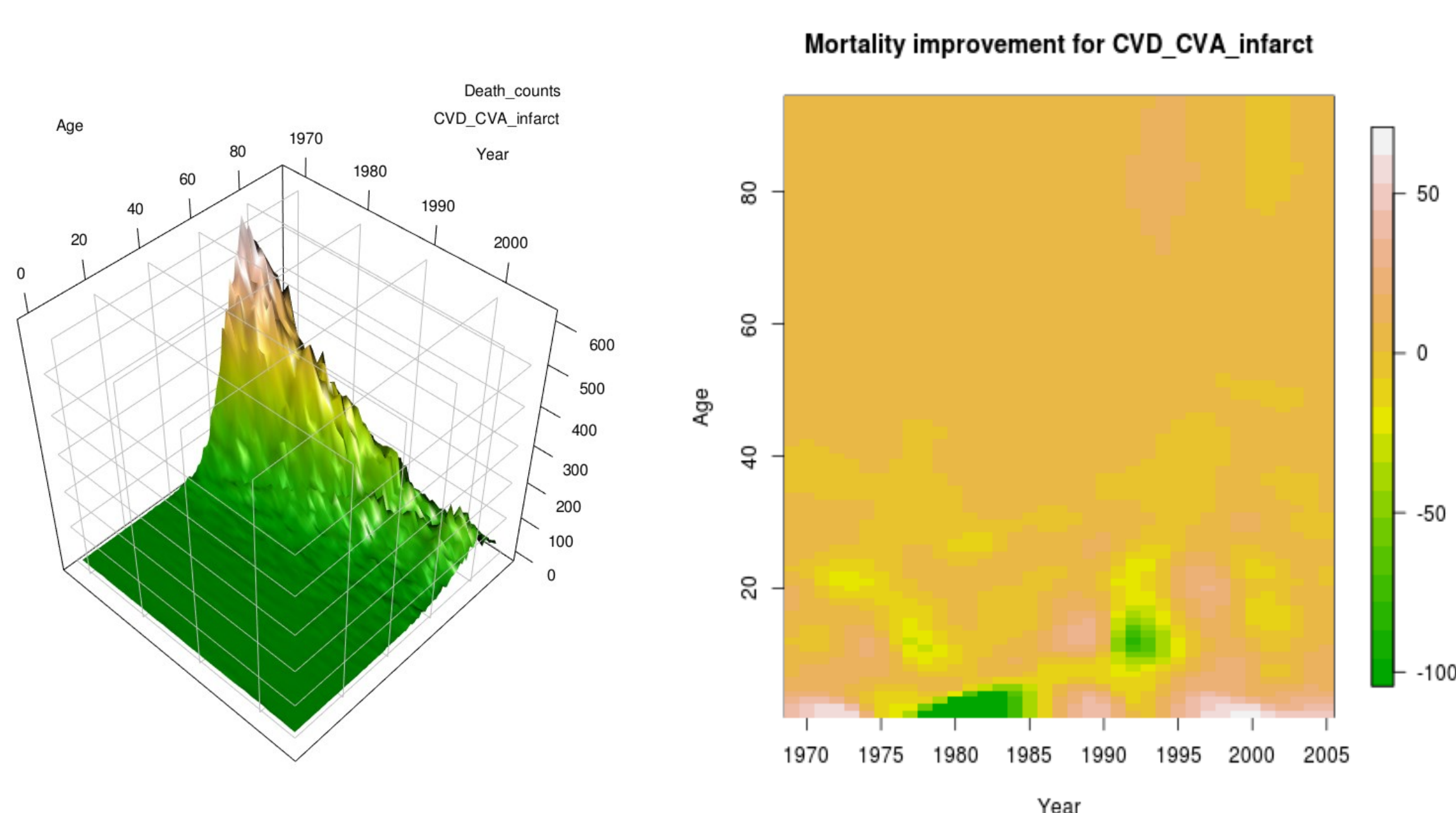
Women: CVD mortality trends, England and Wales, 1970-2013

Central mortality and mortality improvement component heatmap



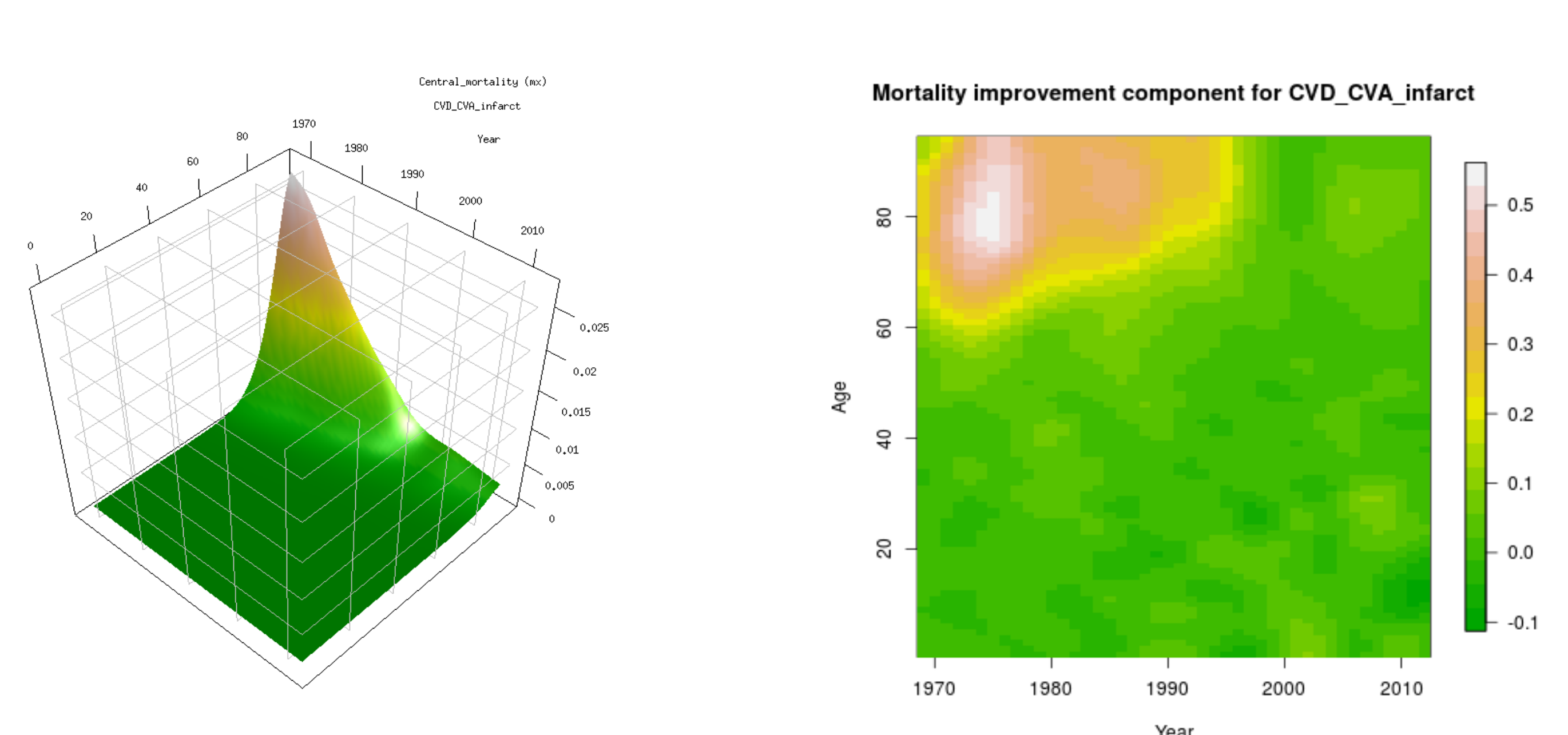
Men: ischaemic stroke mortality trends, England and Wales, 1970-2013

Death counts and mortality improvement heatmap



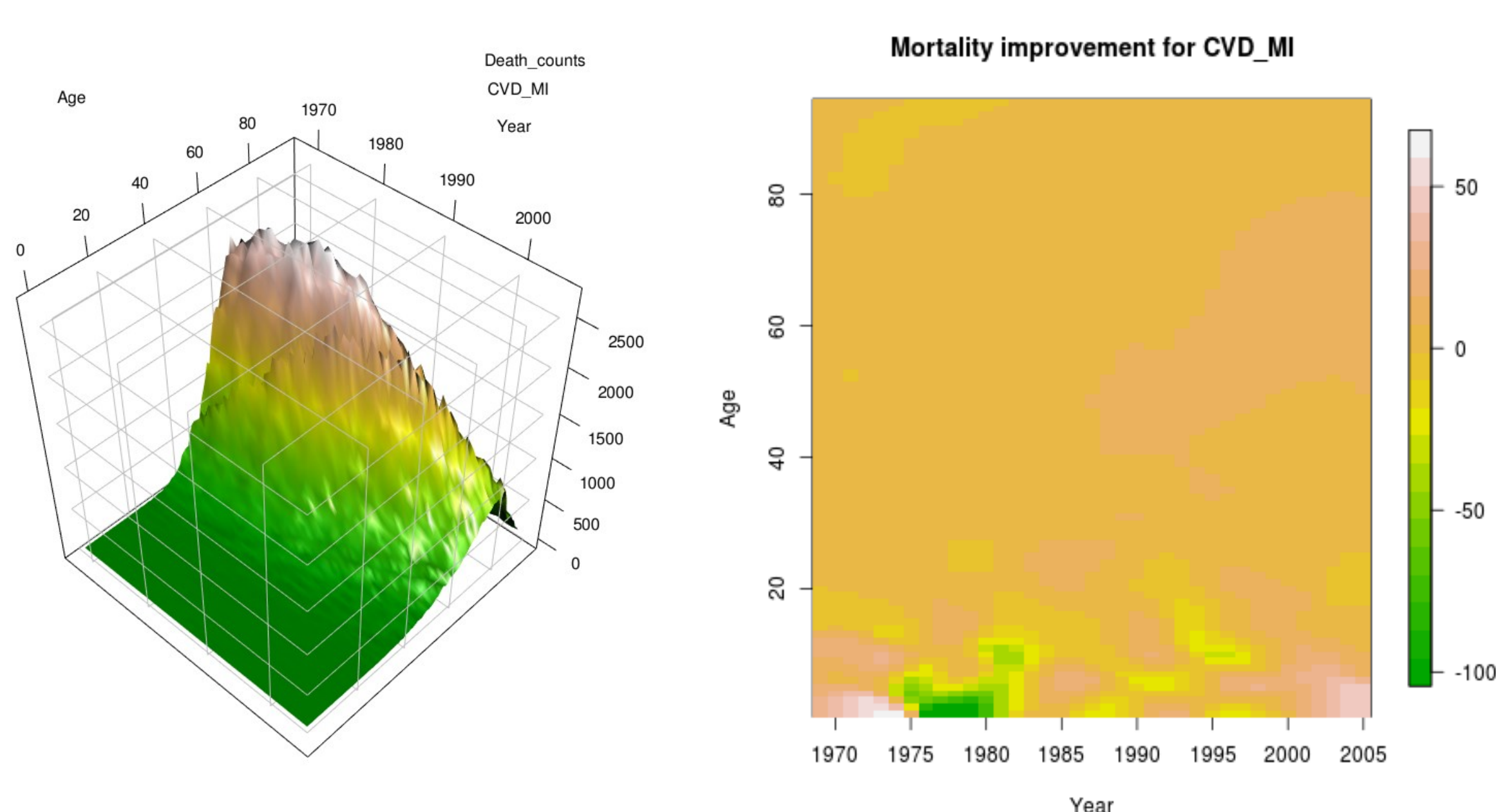
Women: ischaemic stroke mortality trends, England and Wales, 1970-2013

Central mortality and mortality improvement component heatmap



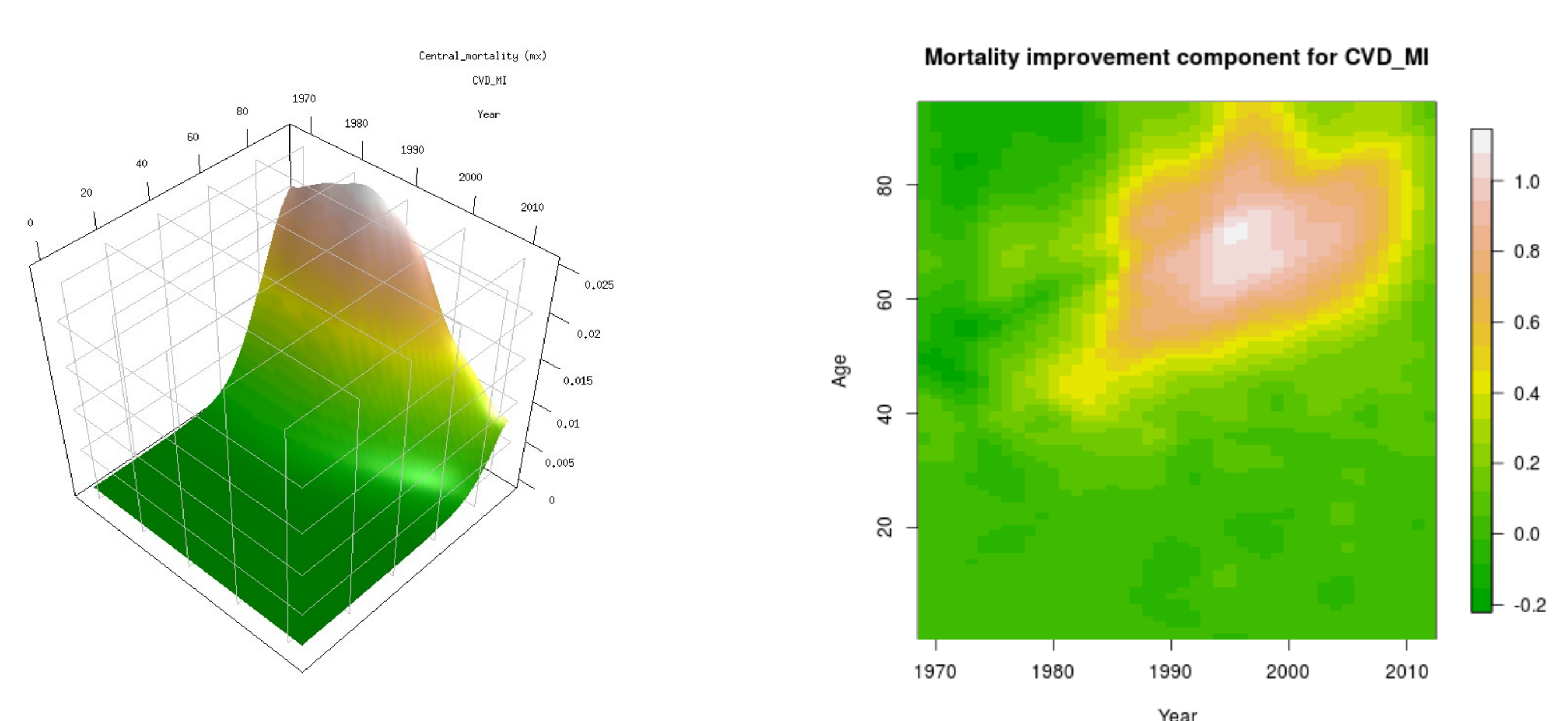
Men: myocardial infarction mortality trends, England and Wales, 1970-2013

Death counts and mortality improvement heatmap



Women: myocardial infarction mortality trends, England and Wales, 1970-2013

Central mortality and mortality improvement component heatmap



Conclusions

The *Requiem* model 3-D visualisation shows the substantial improvement in mortality from CVD and all causes was largely driven by improvements in ischaemic stroke and MI in the golden cohort. In future years, as this cohort eventually dies, mortality improvement rates in CVD are likely to decline.