

**ARC Webinar Series 2018**

**17 September 2018 – Use of Big Health and Actuarial Data for understanding Longevity and Morbidity Risks**

**Additional Questions from the Audience**

During the live webinars we received a large number of questions from the audience and it was not possible to answer all in the one hour sessions. Therefore the Principal Investigator, Elena Kulinskaya and Co-investigator, Nigel Wright have provided answers to these additional questions below.

**Q. Is "The Health Improvement Network" data open to all? I'm assuming not.**

The data is available on a commercial basis provided the use is approved by the internal ethics committee.

**Q. What is the annual cost of an average individual's statin prescription?**

See [https://www.ncbi.nlm.nih.gov/pubmed/22392823](https://protect-eu.mimecast.com/s/sq11CjYRzsnYGNsR3VUN?domain=emea01.safelinks.protection.outlook.com)  A quote from their abstract (date for 2005-2006):

Estimated annual costs/patient in the U.S. ranged from $313 for generic lovastatin to $1428 for non-generic simvastatin. In the U.K., annual costs/patient ranged from $164 for generic simvastatin to $509 for non-generic atorvastatin.

**Q. How accurate are the socio economic measures in the THIN data? I.e. do GPs fill these in accurately?**

It is not the GPs who fill this. The values are obtained from patient’s postcode by validated instruments such as Index of Multiple Deprivation or Mosaic.

**Q. Does this analysis use any quality of life related metrics? i.e. Is the extra expectation of life of a high quality?**

We have not investigated this so far, partly due to data limitations.

**Q. How did you consider socio economic differential in your study?**

We used Mosaic at 11 levels and IMD at 5 levels (quintiles) as the additional predictors in our models.

**Q. This study is done on primary care only. How significant is it to investigate mortality or morbidity experience of population?**

This is an investigation at the population level. Our data (THIN) is representative of the UK population. In the UK context, ‘primary care’ means healthcare provided by a General Practice surgery.

**Q. Is there evidence from your research (or elsewhere) that Statin intake has any negative impacts, perhaps in terms of quality of life?**

We have not investigated quality of life so far. We found that statins are not helpful for longevity at younger ages and at lower cardo-vascular risk levels, but we have not found any negative effects.

**Q. What are your predictions for the mortality rate over next 5-10 years and why?**

Our models look at historic data. We have deliberately not made projections of the future – rather, we aim to provide tools that people can use in their own projections. An example of this is where we provide an estimate of the increase in life expectancy that would result from a 100% statin prescription rate.

**Q. Is your view that Statins are of unqualified benefit to everyone aged over say 65?**

Only at higher CVD risk levels when looking at life expectancy. We have not yet included quality of life measures in the analyses. There will always be individuals who have circumstances that mean a treatment would not be best for them.

**Q. Do you think modelling mortality experience on multiple level instead of individual level cannot provide the relevant drivers or the change in these drive change?**

Primarily, for grouped data it is almost impossible to see any interactions of various factors.

**Q. How many health treatments have you analysed and how do you allow for interactions of treatments?**

We have a list of health conditions which may affect the outcome of interest, and we add all these conditions to the model and adjust for them.

**Q. How do you derive effective age for each case?**

Effective age calculation includes adding up changes in effective age due to all individual levels of relevant covariates, such as say statin prescription, smoking, gender, age, IMD level, etc. The changes in effective age are derived from the hazard ratio. For more details of this in action, see the sessional meeting paper from 25 June 2018 [https://www.actuaries.org.uk/documents/arc-sessional-25-june-2018](https://protect-eu.mimecast.com/s/3URfClRYBi21P4TqOLfK?domain=emea01.safelinks.protection.outlook.com)

**Q. A lot of improvements have been derived from advances of medical science. What are thoughts on climate change and increase use of GM foods on future longevity?**

Unfortunately, we cannot see it from our data.

**Q. What programming language/software did you use to analyse the data and would you continue to use this?**

We use SQL to select the data for a particular study, and we use R for statistical analysis. Yes, we intend to continue using R.