

# MAS223 Statistical Modelling

## Practical 4

This practical counts for 10% of your mark on this module. Submit your report on Blackboard by Monday 16th May, 4pm. Please make sure you hand-in **on time**. In line with university policy, for every university-working-day late a submission is, the awarded mark will be reduced. Five (5) working days after the deadline there is a cut-off after which a mark of 0 will be returned.

This practical is assessed, so your submitted report must be **entirely** your own work. **Do not ask the lecturer or tutors any questions about this practical.** Also be aware of the University guidelines on plagiarism (<https://www.sheffield.ac.uk/ssid/exams/plagiarism>). Your work may be cross-referenced for plagiarism with assignments from previous years, as well as this year.

## 1 Background

In 2011, the UK Government announced plans for a major re-organisation of the National Health Service. The Health and Social Care Bill 2011<sup>1</sup> included plans to abolish primary care trusts, and transfer their control of the budget (about 80% of the total) to consortia of GPs and other clinicians<sup>2</sup>. In justifying the plans, former Health Secretary Andrew Lansley argued that “We don’t get the results we should compared with other European countries; if we did we would save thousands of lives.”<sup>3</sup> Other criticisms of previous health-care provision included the claims “Someone in this country is twice as likely to die from a heart attack as someone in France” and “survival rates from cervical, colorectal and breast cancer are amongst the worst in the OECD”<sup>4</sup>. These claims themselves have been criticised, and it has been suggested that life expectancy is a more reliable indicator of “health experience”<sup>5</sup>.

The World Health Organisation (WHO) published data on health expenditure in each country, together with outcomes such as life expectancy<sup>6</sup>. Some data has been extracted from the WHO database, and is stored in the dataset `who`, within the R workspace `MAS223.RData`. As well as expenditure, the dataset includes other variables that may influence health outcomes: tobacco consumption, alcohol consumption, and obesity rates. The countries listed are the member states of the Organisation for Economic Co-operation and Development (OECD)<sup>7</sup> (with Luxembourg omitted, as not all data were available). The variables recorded were from the WHO Global Health Observatory in February 2011.

- **expenditure**: total expenditure per person on health, measured in purchasing power parity (PPP) international dollars. (Two countries with equal expenditure using this measure should be able to buy, approximately, the same goods and services).
- **life**: life expectancy at birth, in years.
- **tobacco**: Percentage of tobacco user among adults ( $\geq 15$  years), averaged over males and females.
- **alcohol**: Alcohol consumption among adults ( $\geq 15$  years) (litres of pure alcohol per year)
- **obesity**: Percentage of adults classified as obese ( $\geq 15$  years), averaged over males and females.

## 2 Tasks

1. Using the available data, assess the 2011 performance of UK healthcare compared to healthcare in other OECD countries.
2. Write up your findings in a brief report (maximum of four pages, including graphs, but excluding an appendix with R code). You will be graded on clarity of expression and reasoning, as well as correctness of answers. Make sure you explain whether your results suggest that the UK didn't "get the results we should compared with other European countries" (in 2011), as claimed by Andrew Lansley, and why you have reached this conclusion.

**Note.** It is essential that you read the *Guidelines on Presentation* and *Presentation Checklist*, given on Blackboard, before you write your practical.

## 3 References

1. Department of Health, 2011. Health and Social Care Bill 2011 [Online]. Available at: [www.dh.gov.uk/en/Publicationsandstatistics/Legislation/Actsandbills/HealthandSocialCareBill2011](http://www.dh.gov.uk/en/Publicationsandstatistics/Legislation/Actsandbills/HealthandSocialCareBill2011) [Accessed 07/02/11].
2. BBC News, 2012. Q&A; The NHS shake-up. Available at: [www.bbc.co.uk/news/health-12177084](http://www.bbc.co.uk/news/health-12177084) [Accessed 28/03/12].
3. BBC News, 2011. Andrew Lansley plays down risks of his NHS changes [Online]. Available at: [www.bbc.co.uk/news/uk-politics-12318177](http://www.bbc.co.uk/news/uk-politics-12318177) [Accessed 07/02/11].
4. Montgomerie, T., 2011. The myths and the facts about the NHS reforms [Online]. Available at: [conservativehome.blogs.com/thetorydiary/2011/01/the-myths-and-the-facts-about-the-nhs-reforms-savethenhs](http://conservativehome.blogs.com/thetorydiary/2011/01/the-myths-and-the-facts-about-the-nhs-reforms-savethenhs) [Accessed 07/02/11].
5. Campbell, M., 2011. Watch out for abuse of statistics in health policy [Online]. Available at [www.guardian.co.uk/commentisfree/2011/feb/01/health-statistics-policy](http://www.guardian.co.uk/commentisfree/2011/feb/01/health-statistics-policy) [Accessed 07/02/11].
6. World Health Organisation, 2011. WHO Global Health Observatory [Online]. Available at [apps.who.int/ghodata](http://apps.who.int/ghodata) [Accessed 07/02/11].
7. OECD, 2011. Organisation for Economic Co-operation and Development [Online]. Available at [www.oecd.org](http://www.oecd.org) [Accessed 07/02/11].