Assignment III

Worth 15% of course assessment; due by 3pm on Friday 7th June, 2019.

Most-relevant lectures: Lectures 21 – 26.

The total marks for this assignment is 45.

Please provide code where appropriate.

Report to the Government on the effectiveness of interventions. [45 marks]

The CSV file `NorovirusDataA3` contains information regarding independent outbreaks in a set of 125 hospital wards of varying sizes. The first column contains the number of occupied beds in the ward, the second column contains the number of those patients which succumbed to norovirus during the outbreak, and the third column indicates the control action implemented; in the last column, 0 corresponds to standard practices, 1 corresponds to a trial intervention strategy, and 2 corresponds to different trial intervention strategy.

You are to analyse this data to advise the Government on the effectiveness of their interventions, and to advise them on which intervention should be adopted (if any).

You may assume that the interventions work to reduce the effective transmission rate parameter. The Chief Medical Officer has said that R_0 for norovirus in typical hospital settings is between 2 and 3 with (approximately) 66% probability; you may use this expert opinion as prior knowledge.

You are to prepare two reports. One is for the Government. The second is to provide detail on how you have performed the statistical analysis, including the model(s) used, any assumptions you have made and providing evidence that your approach/algorithms are working correctly, for example through the use of simulated data of similar form to the 'real' data (e.g., using trace plots from multiple independent chains, and kernel density estimators and box plots). This assignment is deliberately vague – you need to make decisions, but feel free to ask for feedback as you make progress.