Introduction:

The outcome variables are Y.D and Y.T

The 2 covariates are: Median Household Income, Disability18\_64

Goal: Comparing 4 cases

* ***Case1:*** original data
* ***Case2***: modify the death count to 0.5\*Death, want to see how the outputs will change when under-reporting happens
* ***Case3***: modify the death count to p\* Death, where p is proportional to the count of disabilities in each county; want to see how the outputs will change when under-reporting happens across counties according to the specific variable “Disability”
* ***Case4***: modify the death count to p\* Death, where under-reporting only varies across counties, but we still have iid random variables

Code being used:

Case 2: y.D = ceiling(TD$Death\*0.5)

Case 3:

logit2prob <- function(logit){

odds <- exp(logit)

prob <- odds / (1 + odds)

return(prob)

}

p <- logit2prob(0.5\*TD$Disability18\_64)

y.D = ceiling(TD$Death\*p)

Case 4:

p<-runif(88, min = 0.25, max = 1)

y.D = ceiling(TD$Death\*p)

Note:

* To observe clear differentiation, we must tune the probability to be extremely small

Table comparisons:

Table of the covariate effects estimates (Case 1 - original)

|  |  |  |
| --- | --- | --- |
|  | beta[1] | beta[2] |
| min | -0.34181 | 0.01664 |
| 1st Qu | -0.14678 | 0.19835 |
| median | -0.09931 | 0.26341 |
| mean | -0.10320 | 0.26044 |
| 3rd Qu | -0.05893 | 0.31540 |
| max | 0.08718 | 0.51282 |
| sd | 0.06896268 | 0.08000747 |

Table of the covariate effects estimates (Case 2 – 0.8 under)

|  |  |  |
| --- | --- | --- |
|  | beta[1] | beta[2] |
| min | -0.32926 | 0.007617 |
| 1st Qu | -0.13492 | 0.218758 |
| median | -0.08694 | 0.281419 |
| mean | -0.09293 | 0.279841 |
| 3rd Qu | -0.04492 | 0.342603 |
| max | 0.15210 | 0.503538 |
| sd | 0.06971472 | 0.08535893 |

Table of the covariate effects estimates (Case 3 – disability)

|  |  |  |
| --- | --- | --- |
|  | beta[1] | beta[2] |
| min | -0.29949 | -0.07806 |
| 1st Qu | -0.16668 | 0.21160 |
| median | -0.12216 | 0.26654 |
| mean | -0.12319 | 0.25990 |
| 3rd Qu | -0.08249 | 0.32152 |
| max | 0.08364 | 0.44124 |
| sd | 0.06284369 | 0.08228752 |

Table of the covariate effects estimates (Case 4 – varies iid)

|  |  |  |
| --- | --- | --- |
|  | beta[1] | beta[2] |
| min | -0.29650 | 0.02907 |
| 1st Qu | -0.12905 | 0.22324 |
| median | -0.07740 | 0.27885 |
| mean | -0.08211 | 0.29008 |
| 3rd Qu | -0.02975 | 0.35100 |
| max | 0.10171 | 0.456879 |
| sd | 0.07571191 | 0.09654006 |

Maps of the Death and treatment counts:

Case 1: case 2:

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Case 3: Case 4:

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Maps of the spatial factors and the loadings:

Case 1:

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Case 2:

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Case 3:

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Case 4:

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Maps of the error terms V1-Death and V2-Treatment:

Case 1:

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