Variable selection in individual patient data meta-analysis - stent dataset

Michael Seo

5 August 2019

## glmm\_null

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: binomial ( logit )  
## Formula: y ~ studyid + treat + (-1 + treat | studyid)  
## Data: mydata  
##   
## AIC BIC logLik deviance df.resid   
## 4285.6 4358.7 -2132.8 4265.6 11096   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -0.3634 -0.2931 -0.2288 -0.1224 10.4429   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## studyid treat 0 0   
## Number of obs: 11106, groups: studyid, 8  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -4.58259 0.32021 -14.311 < 2e-16 \*\*\*  
## studyid2 0.93318 0.35853 2.603 0.00925 \*\*   
## studyid3 1.18835 0.78536 1.513 0.13025   
## studyid4 1.74166 0.33903 5.137 2.79e-07 \*\*\*  
## studyid5 2.12812 0.34713 6.131 8.75e-10 \*\*\*  
## studyid6 0.49172 0.36076 1.363 0.17287   
## studyid7 2.19284 0.32634 6.720 1.82e-11 \*\*\*  
## studyid8 2.55808 0.32753 7.810 5.71e-15 \*\*\*  
## treat -0.10926 0.08704 -1.255 0.20938   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr) stdyd2 stdyd3 stdyd4 stdyd5 stdyd6 stdyd7 stdyd8  
## studyid2 -0.878   
## studyid3 -0.401 0.358   
## studyid4 -0.923 0.830 0.379   
## studyid5 -0.907 0.810 0.370 0.857   
## studyid6 -0.868 0.780 0.356 0.827 0.805   
## studyid7 -0.965 0.862 0.393 0.912 0.890 0.857   
## studyid8 -0.961 0.859 0.392 0.908 0.887 0.854 0.943   
## treat -0.128 -0.001 -0.003 -0.043 0.000 -0.041 -0.002 -0.002  
## convergence code: 0  
## boundary (singular) fit: see ?isSingular

## glmm\_full

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: binomial ( logit )  
## Formula:   
## y ~ studyid + (age + gender + diabetes + stable\_cad + multivessel +   
## ladtreated + overlap + m\_dia\_above\_3 + num\_stent) \* treat +   
## (-1 + treat | studyid)  
## Data: mydata  
##   
## AIC BIC logLik deviance df.resid   
## 4107.3 4312.1 -2025.7 4051.3 11078   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -1.0069 -0.2692 -0.1763 -0.1087 23.0529   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## studyid treat 0 0   
## Number of obs: 11106, groups: studyid, 8  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -4.299408 0.326634 -13.163 < 2e-16 \*\*\*  
## studyid2 0.524606 0.365260 1.436 0.150929   
## studyid3 1.071342 0.795265 1.347 0.177931   
## studyid4 1.059063 0.346319 3.058 0.002228 \*\*   
## studyid5 0.807254 0.360994 2.236 0.025339 \*   
## studyid6 0.298375 0.365182 0.817 0.413896   
## studyid7 1.355898 0.337655 4.016 5.93e-05 \*\*\*  
## studyid8 1.786975 0.334604 5.341 9.27e-08 \*\*\*  
## age 0.697817 0.088616 7.875 3.42e-15 \*\*\*  
## gender -0.009563 0.060064 -0.159 0.873499   
## diabetes 0.202784 0.056544 3.586 0.000335 \*\*\*  
## stable\_cad -0.264425 0.071444 -3.701 0.000215 \*\*\*  
## multivessel 0.148957 0.072012 2.068 0.038594 \*   
## ladtreated 0.098352 0.065133 1.510 0.131035   
## overlap 0.146446 0.064927 2.256 0.024099 \*   
## m\_dia\_above\_3 -0.051418 0.047019 -1.094 0.274153   
## num\_stent 0.017515 0.070713 0.248 0.804373   
## treat 0.044368 0.118005 0.376 0.706930   
## age:treat -0.084909 0.114654 -0.741 0.458958   
## gender:treat 0.021694 0.084674 0.256 0.797793   
## diabetes:treat -0.033872 0.078758 -0.430 0.667143   
## stable\_cad:treat 0.054410 0.096455 0.564 0.572688   
## multivessel:treat -0.087968 0.093551 -0.940 0.347053   
## ladtreated:treat -0.184145 0.089987 -2.046 0.040723 \*   
## overlap:treat -0.015321 0.091473 -0.167 0.866983   
## m\_dia\_above\_3:treat 0.094494 0.073102 1.293 0.196138   
## num\_stent:treat -0.081490 0.102641 -0.794 0.427233   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
## convergence code: 0  
## boundary (singular) fit: see ?isSingular

## [1] 0.3357842 0.6630678 1.3093498

## [1] 0.9603051 1.3072498 1.7795407

## naive step

##   
## Call:  
## glm(formula = y ~ age + diabetes + stable\_cad + multivessel +   
## ladtreated + overlap + num\_stent + treat + ladtreated:treat +   
## num\_stent:treat, family = binomial(link = "logit"), data = mydata)  
##   
## Deviance Residuals:   
## Min 1Q Median 3Q Max   
## -1.0062 -0.3717 -0.2657 -0.1836 3.4074   
##   
## Coefficients:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -3.20028 0.07519 -42.560 < 2e-16 \*\*\*  
## age 0.80570 0.05549 14.520 < 2e-16 \*\*\*  
## diabetes 0.21441 0.03895 5.505 3.69e-08 \*\*\*  
## stable\_cad -0.22341 0.04774 -4.680 2.87e-06 \*\*\*  
## multivessel 0.07726 0.04624 1.671 0.094751 .   
## ladtreated 0.12197 0.06399 1.906 0.056637 .   
## overlap 0.17471 0.04530 3.856 0.000115 \*\*\*  
## num\_stent 0.05720 0.06021 0.950 0.342126   
## treat -0.09185 0.08937 -1.028 0.304083   
## ladtreated:treat -0.16787 0.08865 -1.894 0.058279 .   
## num\_stent:treat -0.11751 0.07821 -1.503 0.132948   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## (Dispersion parameter for binomial family taken to be 1)  
##   
## Null deviance: 4565.3 on 11105 degrees of freedom  
## Residual deviance: 4176.2 on 11095 degrees of freedom  
## AIC: 4198.2  
##   
## Number of Fisher Scoring iterations: 6

## naive lasso

## 20 x 1 sparse Matrix of class "dgCMatrix"  
## 1  
## (Intercept) -3.114580803  
## age 0.754078255  
## gender .   
## diabetes 0.185149989  
## stable\_cad -0.185828070  
## multivessel 0.053289199  
## ladtreated 0.008387465  
## overlap 0.155171227  
## m\_dia\_above\_3 -0.020112764  
## num\_stent .   
## treat -0.141657500  
## age:treat .   
## gender:treat .   
## diabetes:treat .   
## stable\_cad:treat .   
## multivessel:treat .   
## ladtreated:treat .   
## overlap:treat .   
## m\_dia\_above\_3:treat .   
## num\_stent:treat .

## intercept age gender   
## 0.08271571 0.07363262 0.03674681   
## diabetes stable\_cad multivessel   
## 0.04061454 0.06842652 0.05548256   
## ladtreated overlap m\_dia\_above\_3   
## 0.05244410 0.04382439 0.04425242   
## num\_stent treat age:treat   
## 0.04456074 0.09191703 0.05476570   
## gender:treat diabetes:treat stable\_cad:treat   
## 0.04362611 0.04240990 0.07045252   
## multivessel:treat ladtreated:treat overlap:treat   
## 0.04873141 0.07377359 0.04845644   
## m\_dia\_above\_3:treat num\_stent:treat   
## 0.06152885 0.06829188

## glmmLasso

## [1] "Iteration 1"  
## [1] "Iteration 2"  
## [1] "Iteration 3"  
## [1] "Iteration 4"  
## [1] "Iteration 5"  
## [1] "Iteration 6"  
## [1] "Iteration 7"  
## [1] "Iteration 8"  
## [1] "Iteration 9"  
## [1] "Iteration 10"  
## [1] "Iteration 11"  
## [1] "Iteration 12"  
## [1] "Iteration 13"  
## [1] "Iteration 14"  
## [1] "Iteration 15"  
## [1] "Iteration 16"  
## [1] "Iteration 17"  
## [1] "Iteration 18"  
## [1] "Iteration 19"  
## [1] "Iteration 20"  
## [1] "Iteration 21"  
## [1] "Iteration 22"  
## [1] "Iteration 23"  
## [1] "Iteration 24"  
## [1] "Iteration 25"  
## [1] "Iteration 26"  
## [1] "Iteration 27"  
## [1] "Iteration 28"  
## [1] "Iteration 29"  
## [1] "Iteration 30"  
## [1] "Iteration 31"  
## [1] "Iteration 32"  
## [1] "Iteration 33"  
## [1] "Iteration 34"  
## [1] "Iteration 35"  
## [1] "Iteration 36"  
## [1] "Iteration 37"  
## [1] "Iteration 38"  
## [1] "Iteration 39"  
## [1] "Iteration 40"  
## [1] "Iteration 41"

## Call:  
## glmmLasso(fix = form.fixed, rnd = form.rnd, data = data\_glmmLasso,   
## lambda = lambda.min, family = family, control = list(index = c(NA,   
## 1:((dim(data\_glmmLasso)[2] - 3)), NA), center = FALSE,   
## standardize = FALSE, q\_start = q\_start, start = start))  
##   
##   
## Fixed Effects:  
##   
## Coefficients:  
## Estimate StdErr z.value p.value  
## (Intercept) -4.2994093 NA NA NA  
## age 0.6978070 NA NA NA  
## gender -0.0095519 NA NA NA  
## diabetes 0.2027733 NA NA NA  
## stable\_cad -0.2644135 NA NA NA  
## multivessel 0.1489462 NA NA NA  
## ladtreated 0.0983413 NA NA NA  
## overlap 0.1464349 NA NA NA  
## m\_dia\_above\_3 -0.0514068 NA NA NA  
## num\_stent 0.0175042 NA NA NA  
## age\_treat -0.0848996 NA NA NA  
## gender\_treat 0.0216819 NA NA NA  
## diabetes\_treat -0.0338607 NA NA NA  
## stable\_cad\_treat 0.0543986 NA NA NA  
## multivessel\_treat -0.0879577 NA NA NA  
## ladtreated\_treat -0.1841337 NA NA NA  
## overlap\_treat -0.0153100 NA NA NA  
## m\_dia\_above\_3\_treat 0.0944832 NA NA NA  
## num\_stent\_treat -0.0814794 NA NA NA  
## as.factor(studyid)2 0.5246068 NA NA NA  
## as.factor(studyid)3 1.0713419 NA NA NA  
## as.factor(studyid)4 1.0590635 NA NA NA  
## as.factor(studyid)5 0.8072538 NA NA NA  
## as.factor(studyid)6 0.2983746 NA NA NA  
## as.factor(studyid)7 1.3558983 NA NA NA  
## as.factor(studyid)8 1.7869751 NA NA NA  
## treat 0.0443695 NA NA NA  
##   
## Random Effects:  
##   
## StdDev:  
## treat:studyid  
## treat:studyid 0.000318861

## [1] 85

## Bayes Lasso

##   
## Parallel computation in progress

##   
## Iterations = 1101:11100  
## Thinning interval = 1   
## Number of chains = 2   
## Sample size per chain = 10000   
##   
## 1. Empirical mean and standard deviation for each variable,  
## plus standard error of the mean:  
##   
## Mean SD Naive SE Time-series SE  
## alpha[1] -4.377417 0.36570 0.0025859 0.0052705  
## alpha[2] -3.698219 0.19747 0.0013963 0.0028091  
## alpha[3] -3.469912 0.82048 0.0058017 0.0083902  
## alpha[4] -3.139791 0.17290 0.0012226 0.0034164  
## alpha[5] -3.469162 0.20543 0.0014526 0.0049894  
## alpha[6] -3.901693 0.22477 0.0015894 0.0042613  
## alpha[7] -2.867950 0.12296 0.0008695 0.0026967  
## alpha[8] -2.458518 0.12310 0.0008704 0.0028151  
## beta[1] 0.637103 0.07800 0.0005516 0.0017151  
## beta[2] -0.008769 0.04401 0.0003112 0.0005568  
## beta[3] 0.171124 0.05084 0.0003595 0.0007231  
## beta[4] -0.219117 0.06079 0.0004298 0.0008151  
## beta[5] 0.110303 0.06366 0.0004501 0.0010636  
## beta[6] 0.050513 0.05385 0.0003808 0.0007676  
## beta[7] 0.125578 0.05358 0.0003789 0.0008602  
## beta[8] -0.026062 0.03975 0.0002811 0.0004950  
## beta[9] 0.022804 0.05038 0.0003562 0.0007918  
## d[1] 0.000000 0.00000 0.0000000 0.0000000  
## d[2] -0.032802 0.15548 0.0010994 0.0047009  
## g[1] -0.032461 0.08364 0.0005914 0.0019459  
## g[2] 0.016066 0.05973 0.0004224 0.0007912  
## g[3] -0.003443 0.06035 0.0004267 0.0008692  
## g[4] 0.005719 0.06836 0.0004834 0.0009313  
## g[5] -0.049949 0.07586 0.0005364 0.0012532  
## g[6] -0.113494 0.07818 0.0005528 0.0011201  
## g[7] -0.012683 0.06313 0.0004464 0.0009829  
## g[8] 0.055714 0.05975 0.0004225 0.0007748  
## g[9] -0.060179 0.06973 0.0004931 0.0010085  
## lambda 9.590768 2.49585 0.0176483 0.0301162  
## sdDelta 0.211230 0.17856 0.0012626 0.0067902  
##   
## 2. Quantiles for each variable:  
##   
## 2.5% 25% 50% 75% 97.5%  
## alpha[1] -5.156743 -4.606424 -4.352294 -4.1258717 -3.72785  
## alpha[2] -4.089395 -3.829049 -3.696262 -3.5638917 -3.31736  
## alpha[3] -5.355108 -3.949123 -3.390531 -2.8952953 -2.09525  
## alpha[4] -3.489165 -3.253271 -3.136809 -3.0220449 -2.80530  
## alpha[5] -3.887940 -3.602557 -3.462231 -3.3286392 -3.08560  
## alpha[6] -4.341035 -4.051813 -3.901196 -3.7525046 -3.45672  
## alpha[7] -3.106549 -2.950721 -2.866938 -2.7872638 -2.62492  
## alpha[8] -2.708322 -2.539540 -2.455610 -2.3751921 -2.22277  
## beta[1] 0.485064 0.583611 0.636470 0.6897865 0.79276  
## beta[2] -0.099636 -0.036090 -0.007389 0.0189168 0.07815  
## beta[3] 0.071049 0.136511 0.171346 0.2047978 0.27107  
## beta[4] -0.342406 -0.258960 -0.218326 -0.1782514 -0.10325  
## beta[5] -0.004284 0.065465 0.106792 0.1518357 0.24481  
## beta[6] -0.043027 0.011976 0.045884 0.0852655 0.16639  
## beta[7] 0.023556 0.088510 0.124775 0.1613034 0.23280  
## beta[8] -0.107508 -0.051747 -0.023690 0.0003487 0.04886  
## beta[9] -0.075504 -0.009239 0.020028 0.0541555 0.12557  
## d[1] 0.000000 0.000000 0.000000 0.0000000 0.00000  
## d[2] -0.344490 -0.123996 -0.034694 0.0608282 0.28609  
## g[1] -0.217160 -0.080982 -0.024820 0.0191141 0.12317  
## g[2] -0.101432 -0.020418 0.013144 0.0523002 0.14112  
## g[3] -0.127862 -0.039674 -0.002751 0.0327122 0.11998  
## g[4] -0.131385 -0.035522 0.003512 0.0461905 0.15019  
## g[5] -0.219090 -0.095574 -0.041657 0.0010127 0.08304  
## g[6] -0.279019 -0.164090 -0.109498 -0.0566302 0.02147  
## g[7] -0.146159 -0.050542 -0.009635 0.0257687 0.11134  
## g[8] -0.049022 0.012801 0.050755 0.0938572 0.18306  
## g[9] -0.212300 -0.104022 -0.053131 -0.0100378 0.06003  
## lambda 5.472543 7.818724 9.326702 11.0886022 15.18736  
## sdDelta 0.009223 0.081178 0.165662 0.2921967 0.67491

## Potential scale reduction factors:  
##   
## Point est. Upper C.I.  
## alpha[1] 1.00 1.00  
## alpha[2] 1.00 1.00  
## alpha[3] 1.00 1.00  
## alpha[4] 1.01 1.03  
## alpha[5] 1.00 1.02  
## alpha[6] 1.01 1.03  
## alpha[7] 1.01 1.03  
## alpha[8] 1.01 1.05  
## beta[1] 1.00 1.02  
## beta[2] 1.00 1.00  
## beta[3] 1.00 1.00  
## beta[4] 1.00 1.01  
## beta[5] 1.00 1.00  
## beta[6] 1.00 1.00  
## beta[7] 1.00 1.00  
## beta[8] 1.00 1.00  
## beta[9] 1.00 1.00  
## d[1] NaN NaN  
## d[2] 1.03 1.09  
## g[1] 1.01 1.05  
## g[2] 1.00 1.00  
## g[3] 1.00 1.00  
## g[4] 1.00 1.01  
## g[5] 1.00 1.01  
## g[6] 1.00 1.00  
## g[7] 1.00 1.00  
## g[8] 1.00 1.00  
## g[9] 1.00 1.00  
## lambda 1.00 1.01  
## sdDelta 1.00 1.00

## SSVS

##   
## Parallel computation in progress

##   
## Iterations = 1101:11100  
## Thinning interval = 1   
## Number of chains = 3   
## Sample size per chain = 10000   
##   
## 1. Empirical mean and standard deviation for each variable,  
## plus standard error of the mean:  
##   
## Mean SD Naive SE Time-series SE  
## Ind[1] 1.000000 0.00000 0.0000000 0.0000000  
## Ind[2] 0.153067 0.36006 0.0020788 0.0026493  
## Ind[3] 0.927367 0.25954 0.0014984 0.0048793  
## Ind[4] 0.970533 0.16911 0.0009764 0.0031268  
## Ind[5] 0.555967 0.49687 0.0028687 0.0086331  
## Ind[6] 0.271233 0.44460 0.0025669 0.0064453  
## Ind[7] 0.759033 0.42768 0.0024692 0.0076074  
## Ind[8] 0.158033 0.36478 0.0021060 0.0029385  
## Ind[9] 0.212200 0.40887 0.0023606 0.0044919  
## Ind2[1] 0.289367 0.45348 0.0026181 0.0063175  
## Ind2[2] 0.189033 0.39154 0.0022606 0.0033074  
## Ind2[3] 0.222033 0.41562 0.0023996 0.0041597  
## Ind2[4] 0.246333 0.43088 0.0024877 0.0046658  
## Ind2[5] 0.313433 0.46390 0.0026783 0.0069567  
## Ind2[6] 0.510500 0.49990 0.0028862 0.0079279  
## Ind2[7] 0.255533 0.43617 0.0025182 0.0052138  
## Ind2[8] 0.258067 0.43758 0.0025264 0.0047953  
## Ind2[9] 0.327800 0.46942 0.0027102 0.0063820  
## alpha[1] -4.358741 0.37037 0.0021383 0.0046283  
## alpha[2] -3.698306 0.19651 0.0011345 0.0023106  
## alpha[3] -3.450201 0.82685 0.0047738 0.0070711  
## alpha[4] -3.131971 0.16592 0.0009580 0.0026402  
## alpha[5] -3.460680 0.20540 0.0011859 0.0041048  
## alpha[6] -3.895488 0.22177 0.0012804 0.0031498  
## alpha[7] -2.870345 0.12064 0.0006965 0.0023332  
## alpha[8] -2.450123 0.12129 0.0007003 0.0021872  
## beta[1] 0.641242 0.07620 0.0004400 0.0014982  
## beta[2] -0.002680 0.03211 0.0001854 0.0003235  
## beta[3] 0.182380 0.04980 0.0002875 0.0006368  
## beta[4] -0.237589 0.05794 0.0003345 0.0006989  
## beta[5] 0.091743 0.07027 0.0004057 0.0013689  
## beta[6] 0.032597 0.05223 0.0003015 0.0009718  
## beta[7] 0.125369 0.05798 0.0003347 0.0009654  
## beta[8] -0.012636 0.03133 0.0001809 0.0003545  
## beta[9] 0.015859 0.04316 0.0002492 0.0007210  
## d[1] 0.000000 0.00000 0.0000000 0.0000000  
## d[2] -0.050471 0.15419 0.0008902 0.0034804  
## eta 0.035855 0.01746 0.0001008 0.0005029  
## g[1] -0.026882 0.07420 0.0004284 0.0017295  
## g[2] 0.007198 0.04116 0.0002376 0.0004146  
## g[3] -0.007895 0.04839 0.0002794 0.0006623  
## g[4] 0.012770 0.05735 0.0003311 0.0007597  
## g[5] -0.034331 0.07068 0.0004080 0.0013785  
## g[6] -0.087986 0.08561 0.0004943 0.0016349  
## g[7] -0.013535 0.05448 0.0003146 0.0008428  
## g[8] 0.032201 0.05021 0.0002899 0.0006819  
## g[9] -0.043581 0.06438 0.0003717 0.0010714  
## sdDelta 0.213061 0.19702 0.0011375 0.0078356  
##   
## 2. Quantiles for each variable:  
##   
## 2.5% 25% 50% 75% 97.5%  
## Ind[1] 1.000000 1.0000000 1.000000 1.0000000 1.00000  
## Ind[2] 0.000000 0.0000000 0.000000 0.0000000 1.00000  
## Ind[3] 0.000000 1.0000000 1.000000 1.0000000 1.00000  
## Ind[4] 0.000000 1.0000000 1.000000 1.0000000 1.00000  
## Ind[5] 0.000000 0.0000000 1.000000 1.0000000 1.00000  
## Ind[6] 0.000000 0.0000000 0.000000 1.0000000 1.00000  
## Ind[7] 0.000000 1.0000000 1.000000 1.0000000 1.00000  
## Ind[8] 0.000000 0.0000000 0.000000 0.0000000 1.00000  
## Ind[9] 0.000000 0.0000000 0.000000 0.0000000 1.00000  
## Ind2[1] 0.000000 0.0000000 0.000000 1.0000000 1.00000  
## Ind2[2] 0.000000 0.0000000 0.000000 0.0000000 1.00000  
## Ind2[3] 0.000000 0.0000000 0.000000 0.0000000 1.00000  
## Ind2[4] 0.000000 0.0000000 0.000000 0.0000000 1.00000  
## Ind2[5] 0.000000 0.0000000 0.000000 1.0000000 1.00000  
## Ind2[6] 0.000000 0.0000000 1.000000 1.0000000 1.00000  
## Ind2[7] 0.000000 0.0000000 0.000000 1.0000000 1.00000  
## Ind2[8] 0.000000 0.0000000 0.000000 1.0000000 1.00000  
## Ind2[9] 0.000000 0.0000000 0.000000 1.0000000 1.00000  
## alpha[1] -5.149402 -4.5873288 -4.332846 -4.0992985 -3.70875  
## alpha[2] -4.090853 -3.8272292 -3.694956 -3.5667495 -3.31861  
## alpha[3] -5.304015 -3.9465699 -3.365842 -2.8622070 -2.08286  
## alpha[4] -3.465773 -3.2421140 -3.129431 -3.0205010 -2.81151  
## alpha[5] -3.892856 -3.5912032 -3.450938 -3.3215367 -3.08017  
## alpha[6] -4.324617 -4.0440178 -3.897106 -3.7496961 -3.45019  
## alpha[7] -3.109078 -2.9512244 -2.868890 -2.7887189 -2.63705  
## alpha[8] -2.694717 -2.5299844 -2.446628 -2.3670389 -2.22068  
## beta[1] 0.498168 0.5899025 0.638905 0.6896946 0.79909  
## beta[2] -0.068853 -0.0215525 -0.002273 0.0164817 0.06179  
## beta[3] 0.078142 0.1511473 0.183528 0.2154628 0.27758  
## beta[4] -0.353844 -0.2744007 -0.236960 -0.2001952 -0.12476  
## beta[5] -0.013513 0.0350692 0.082112 0.1404940 0.24313  
## beta[6] -0.043303 -0.0015988 0.021568 0.0544061 0.16880  
## beta[7] 0.012870 0.0845922 0.127856 0.1662286 0.23528  
## beta[8] -0.082502 -0.0305005 -0.010369 0.0075774 0.04389  
## beta[9] -0.057646 -0.0105191 0.011045 0.0362946 0.12153  
## d[1] 0.000000 0.0000000 0.000000 0.0000000 0.00000  
## d[2] -0.339491 -0.1426168 -0.053920 0.0347751 0.27233  
## eta 0.017723 0.0248305 0.031075 0.0406840 0.08638  
## g[1] -0.224401 -0.0494204 -0.012570 0.0130802 0.08859  
## g[2] -0.070963 -0.0165239 0.005061 0.0284480 0.10027  
## g[3] -0.121446 -0.0302833 -0.005067 0.0181603 0.08629  
## g[4] -0.095321 -0.0167050 0.007169 0.0349892 0.15825  
## g[5] -0.220580 -0.0592558 -0.017626 0.0085440 0.06799  
## g[6] -0.285134 -0.1435197 -0.066350 -0.0208366 0.02753  
## g[7] -0.146650 -0.0365749 -0.008441 0.0162339 0.08852  
## g[8] -0.042061 -0.0003693 0.022139 0.0535012 0.16073  
## g[9] -0.205527 -0.0721175 -0.027638 -0.0009251 0.04627  
## sdDelta 0.003664 0.0689859 0.161623 0.2962467 0.73563

## [1] 0.4509113 0.7537319 1.2599192

## [1] 0.7435342 1.0610655 1.5142006

## Potential scale reduction factors:  
##   
## Point est. Upper C.I.  
## Ind[1] NaN NaN  
## Ind[2] 1.00 1.00  
## Ind[3] 1.00 1.00  
## Ind[4] 1.01 1.02  
## Ind[5] 1.00 1.01  
## Ind[6] 1.00 1.01  
## Ind[7] 1.00 1.00  
## Ind[8] 1.00 1.00  
## Ind[9] 1.00 1.00  
## Ind2[1] 1.00 1.00  
## Ind2[2] 1.00 1.00  
## Ind2[3] 1.00 1.00  
## Ind2[4] 1.00 1.00  
## Ind2[5] 1.00 1.00  
## Ind2[6] 1.00 1.01  
## Ind2[7] 1.00 1.00  
## Ind2[8] 1.00 1.00  
## Ind2[9] 1.00 1.00  
## alpha[1] 1.00 1.00  
## alpha[2] 1.00 1.00  
## alpha[3] 1.00 1.00  
## alpha[4] 1.00 1.00  
## alpha[5] 1.00 1.01  
## alpha[6] 1.00 1.00  
## alpha[7] 1.00 1.00  
## alpha[8] 1.00 1.01  
## beta[1] 1.00 1.01  
## beta[2] 1.00 1.00  
## beta[3] 1.00 1.00  
## beta[4] 1.00 1.00  
## beta[5] 1.00 1.02  
## beta[6] 1.01 1.02  
## beta[7] 1.00 1.00  
## beta[8] 1.00 1.01  
## beta[9] 1.00 1.00  
## d[1] NaN NaN  
## d[2] 1.00 1.00  
## eta 1.01 1.02  
## g[1] 1.00 1.01  
## g[2] 1.00 1.00  
## g[3] 1.00 1.00  
## g[4] 1.00 1.00  
## g[5] 1.00 1.01  
## g[6] 1.01 1.02  
## g[7] 1.00 1.00  
## g[8] 1.00 1.00  
## g[9] 1.00 1.00  
## sdDelta 1.01 1.02