MCMC Diagnostics - IFLS data

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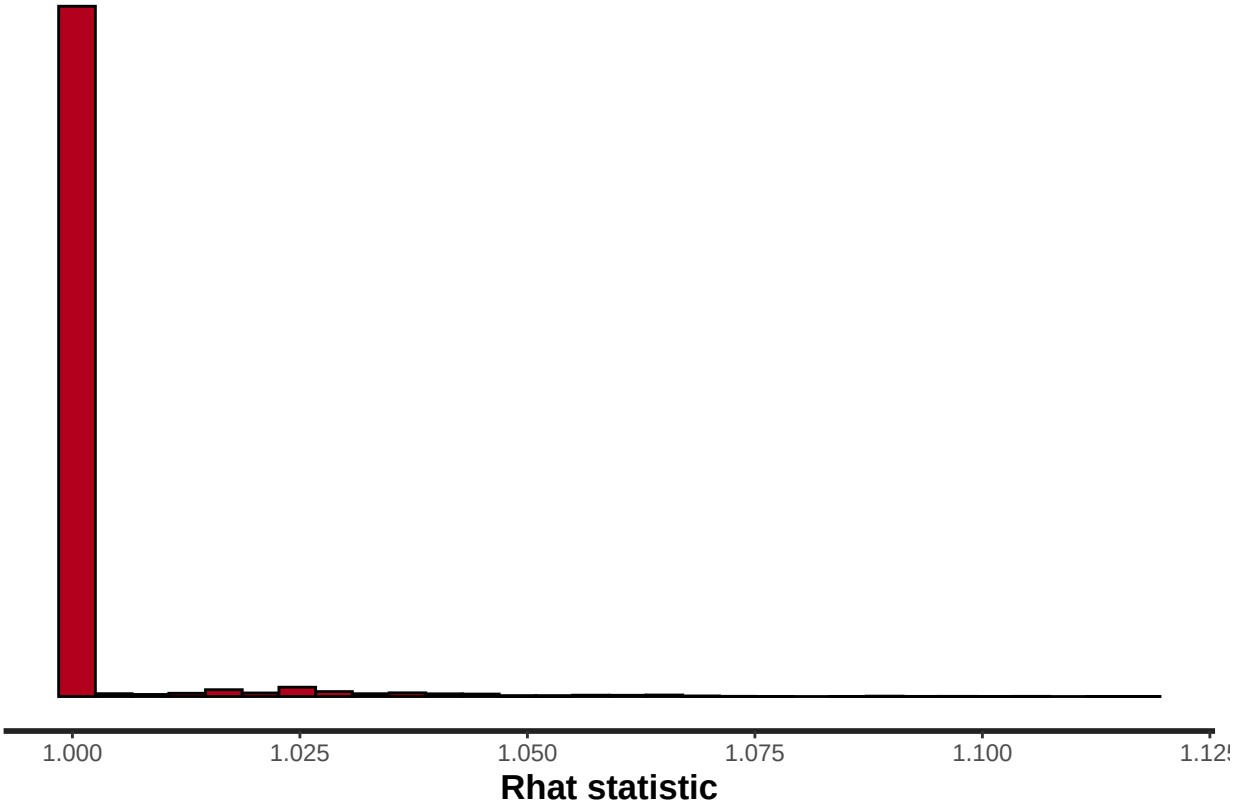
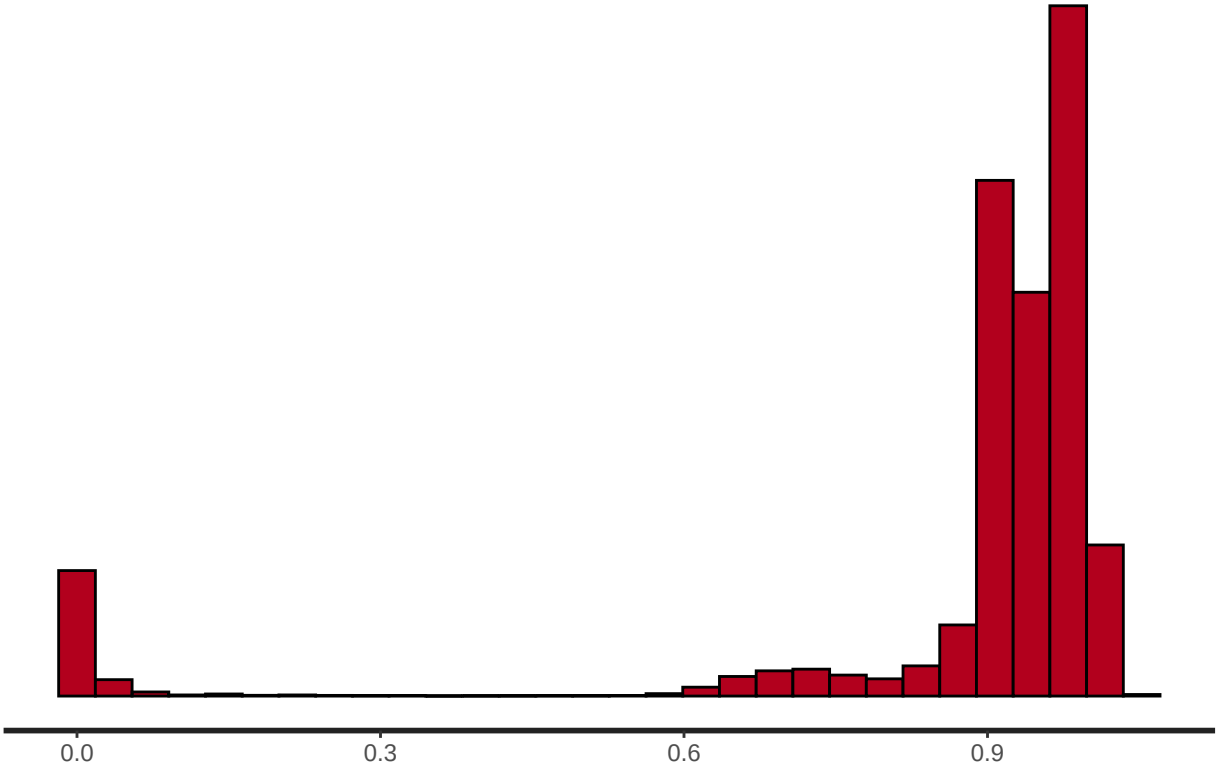
General MCMC diagnostic plots

Overall model diagnostics from rstan package.

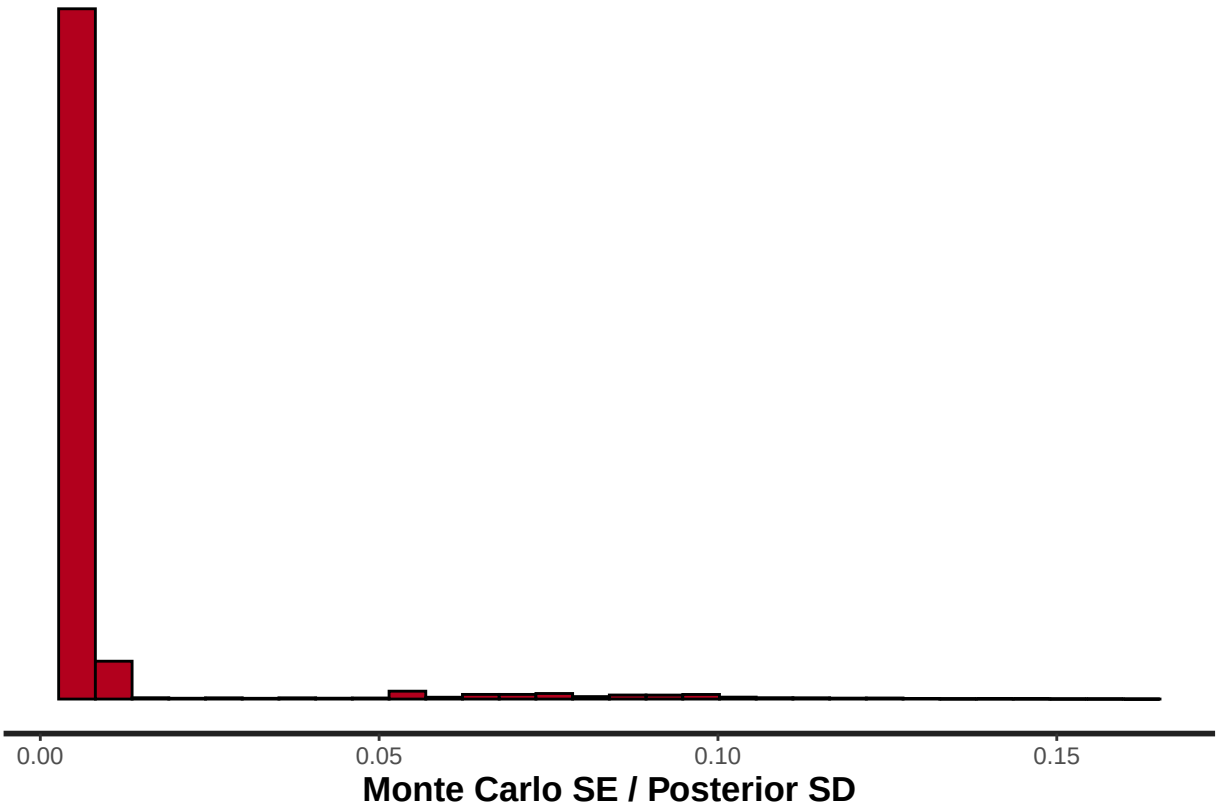
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## Warning: Removed 3955 rows containing non-finite values (stat_bin).
```




```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## Warning: Removed 3955 rows containing non-finite values (stat_bin).
```




```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## Warning: Removed 3955 rows containing non-finite values (stat_bin).
```



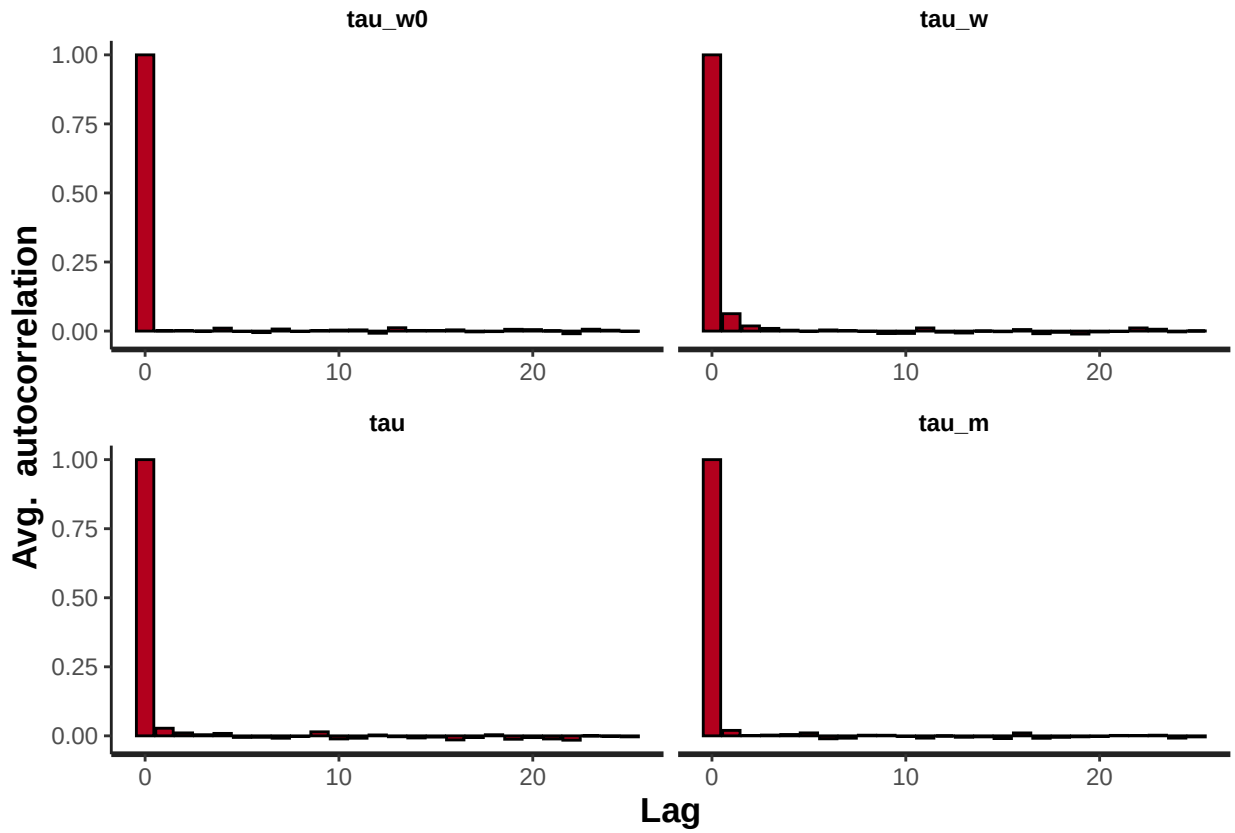
Individual Parameter Diagnostics

Individual parameter plots. Autocorrelation and trace plots for individual parameters, and histograms of posterior medians for group parameters.

```
##             mean      se_mean         sd       25%       50%       75%    n_eff
## tau_w0 0.2219785 0.0006396120 0.08905008 0.1572629 0.2097147 0.2735976 19383.64
## tau_w  0.3867903 0.0010216040 0.13110457 0.2931163 0.3700879 0.4627278 16469.12
## tau    1.2682545 0.0002765472 0.03706532 1.2429548 1.2675457 1.2928505 17963.75
## tau_m  1.5375786 0.0019009329 0.25887844 1.3572192 1.5055915 1.6831276 18546.34
##             Rhat
## tau_w0 0.9999862
## tau_w  0.9999042
## tau    0.9999713
## tau_m  1.0001201
```

```
## Warning: Ignoring unknown parameters: fun.y
```

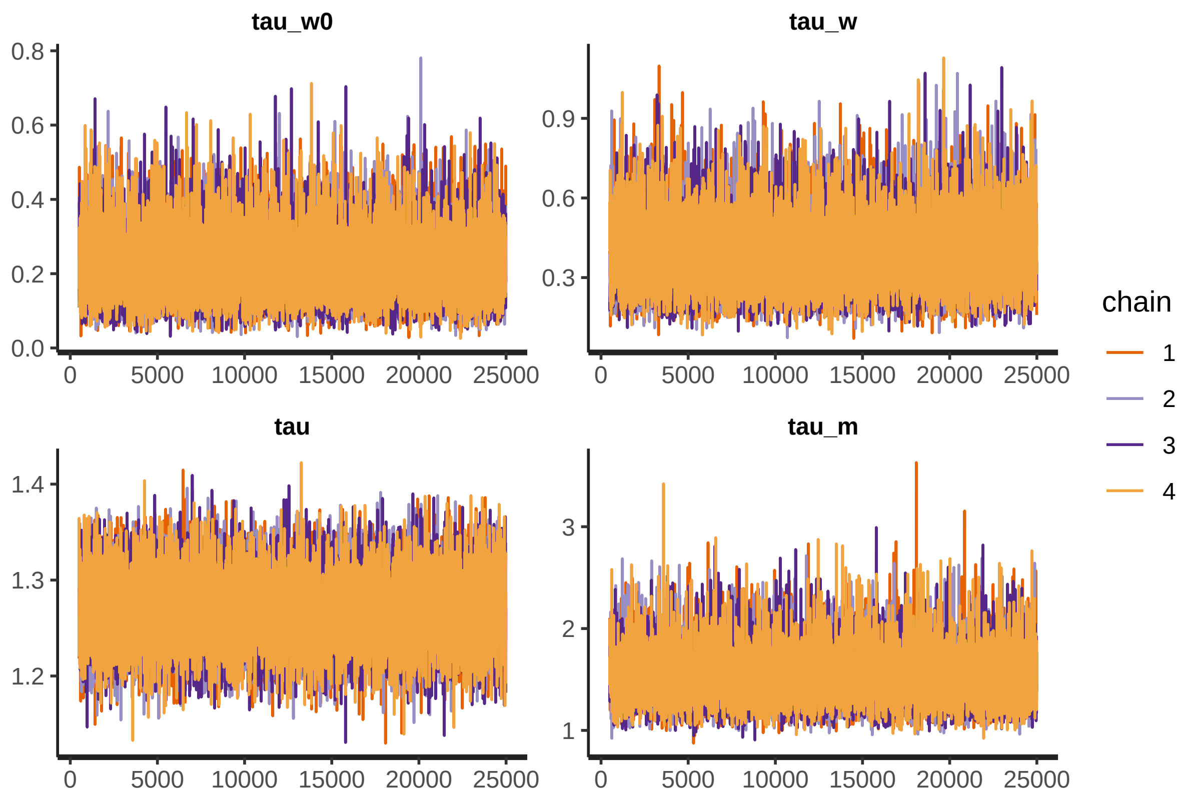
```
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
```




```
##                    mean      se_mean         sd       25%       50%       75%
## free_beta0[1] 1.9193497 0.0011615100 0.15042987 1.8173902 1.9193523 2.0201678
## free_beta0[2] 1.2744848 0.0014793416 0.16900387 1.1601401 1.2722174 1.3864839
## free_beta0[3] 1.3599929 0.0013420106 0.15865919 1.2533666 1.3565465 1.4632708
## free_beta0[4] 0.8456954 0.0017626663 0.23012719 0.6865413 0.8292658 0.9885055
## free_beta0[5] 1.4517273 0.0014472909 0.19660039 1.3183380 1.4473839 1.5802512
## free_beta0[6] 2.4507950 0.0013808321 0.16993783 2.3348809 2.4501904 2.5642877
## free_beta1    2.2463925 0.0006907270 0.07868385 2.1934185 2.2468071 2.2987607
## free_beta2    0.7827555 0.0004831674 0.05409046 0.7458508 0.7828143 0.8191047
## beta0[1]      0.0000000          NaN 0.00000000 0.0000000 0.0000000 0.0000000
## beta0[2]      1.9193497 0.0011615100 0.15042987 1.8173902 1.9193523 2.0201678
## beta0[3]      1.2744848 0.0014793416 0.16900387 1.1601401 1.2722174 1.3864839
## beta0[4]      1.3599929 0.0013420106 0.15865919 1.2533666 1.3565465 1.4632708
## beta0[5]      0.8456954 0.0017626663 0.23012719 0.6865413 0.8292658 0.9885055
## beta0[6]      1.4517273 0.0014472909 0.19660039 1.3183380 1.4473839 1.5802512
## beta0[7]      2.4507950 0.0013808321 0.16993783 2.3348809 2.4501904 2.5642877
## beta1[1]      0.0000000          NaN 0.00000000 0.0000000 0.0000000 0.0000000
## beta1[2]      2.2463925 0.0006907270 0.07868385 2.1934185 2.2468071 2.2987607
## beta1[3]      2.2463925 0.0006907270 0.07868385 2.1934185 2.2468071 2.2987607
## beta1[4]      2.2463925 0.0006907270 0.07868385 2.1934185 2.2468071 2.2987607
## beta1[5]      2.2463925 0.0006907270 0.07868385 2.1934185 2.2468071 2.2987607
## beta1[6]      2.2463925 0.0006907270 0.07868385 2.1934185 2.2468071 2.2987607
## beta1[7]      2.2463925 0.0006907270 0.07868385 2.1934185 2.2468071 2.2987607
## beta2[1]      0.0000000          NaN 0.00000000 0.0000000 0.0000000 0.0000000
## beta2[2]      0.7827555 0.0004831674 0.05409046 0.7458508 0.7828143 0.8191047
## beta2[3]      0.7827555 0.0004831674 0.05409046 0.7458508 0.7828143 0.8191047
## beta2[4]      0.7827555 0.0004831674 0.05409046 0.7458508 0.7828143 0.8191047
```

```
## beta2[5]      0.7827555 0.0004831674 0.05409046 0.7458508 0.7828143 0.8191047
## beta2[6]      0.7827555 0.0004831674 0.05409046 0.7458508 0.7828143 0.8191047
## beta2[7]      0.7827555 0.0004831674 0.05409046 0.7458508 0.7828143 0.8191047
##                   n_eff      Rhat
## free_beta0[1] 16773.45 1.0000827
## free_beta0[2] 13051.38 1.0001099
## free_beta0[3] 13977.15 1.0001987
## free_beta0[4] 17044.95 0.9998916
## free_beta0[5] 18452.58 1.0000820
## free_beta0[6] 15146.02 1.0000275
## free_beta1    12976.52 0.9999547
## free_beta2    12532.74 1.0001062
## beta0[1]           NaN       NaN
## beta0[2]      16773.45 1.0000827
## beta0[3]      13051.38 1.0001099
## beta0[4]      13977.15 1.0001987
## beta0[5]      17044.95 0.9998916
## beta0[6]      18452.58 1.0000820
## beta0[7]      15146.02 1.0000275
## beta1[1]           NaN       NaN
## beta1[2]      12976.52 0.9999547
## beta1[3]      12976.52 0.9999547
## beta1[4]      12976.52 0.9999547
## beta1[5]      12976.52 0.9999547
## beta1[6]      12976.52 0.9999547
## beta1[7]      12976.52 0.9999547
## beta2[1]           NaN       NaN
## beta2[2]      12532.74 1.0001062
## beta2[3]      12532.74 1.0001062
## beta2[4]      12532.74 1.0001062
## beta2[5]      12532.74 1.0001062
## beta2[6]      12532.74 1.0001062
## beta2[7]      12532.74 1.0001062
```

```
## Warning: Ignoring unknown parameters: fun.y
```




```
## Warning: Removed 312 rows containing non-finite values (stat_summary).

## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
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## No summary function supplied, defaulting to `mean_se()`
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## No summary function supplied, defaulting to `mean_se()`
```
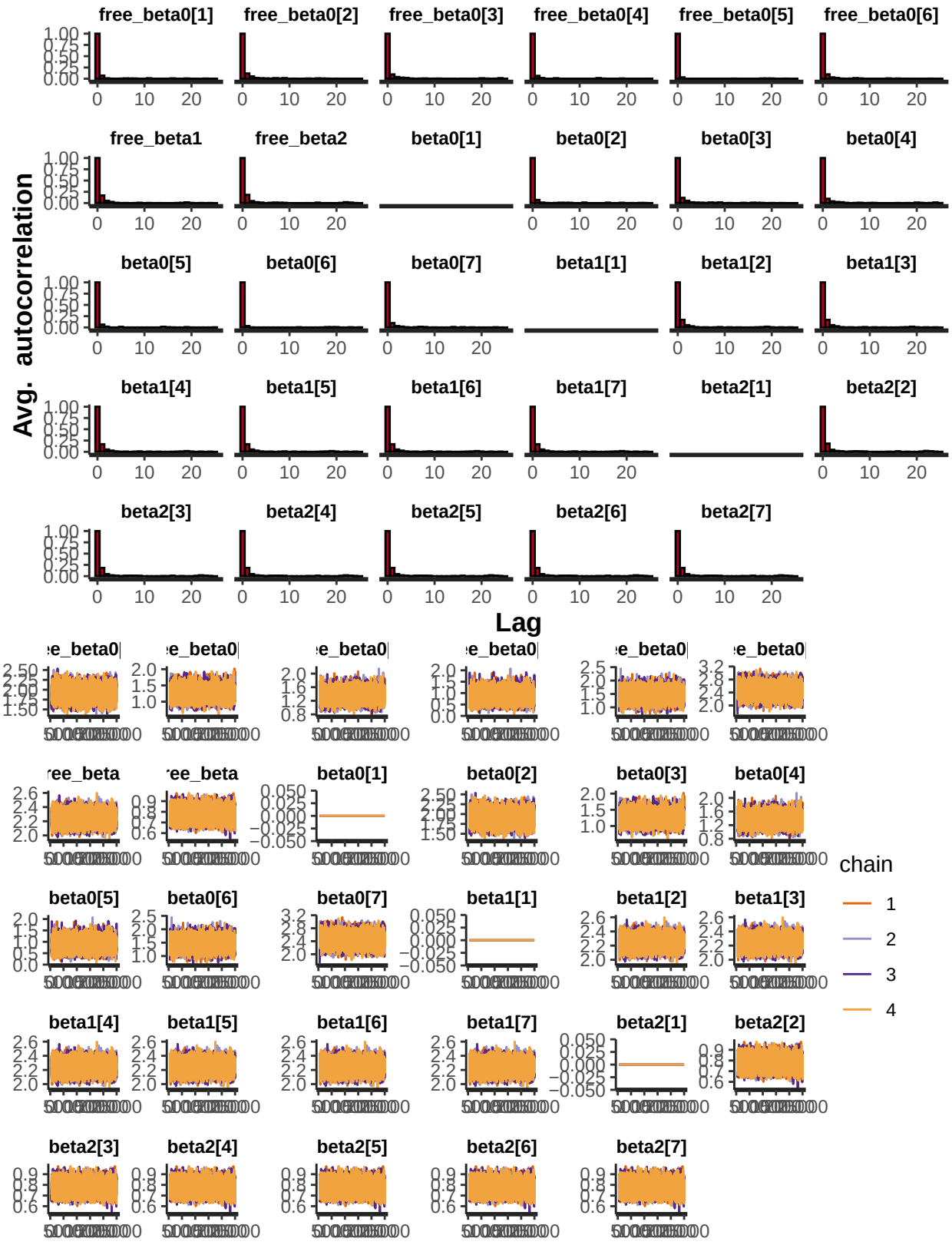
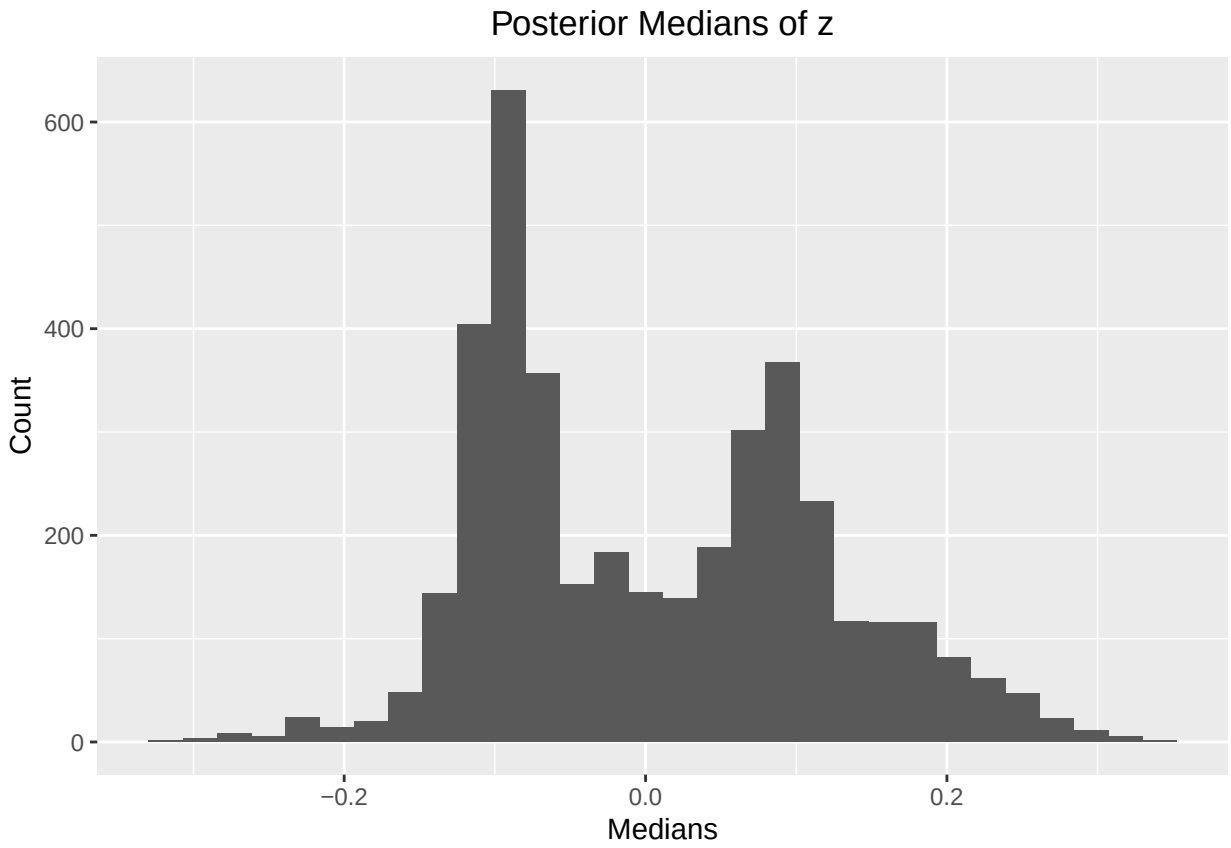
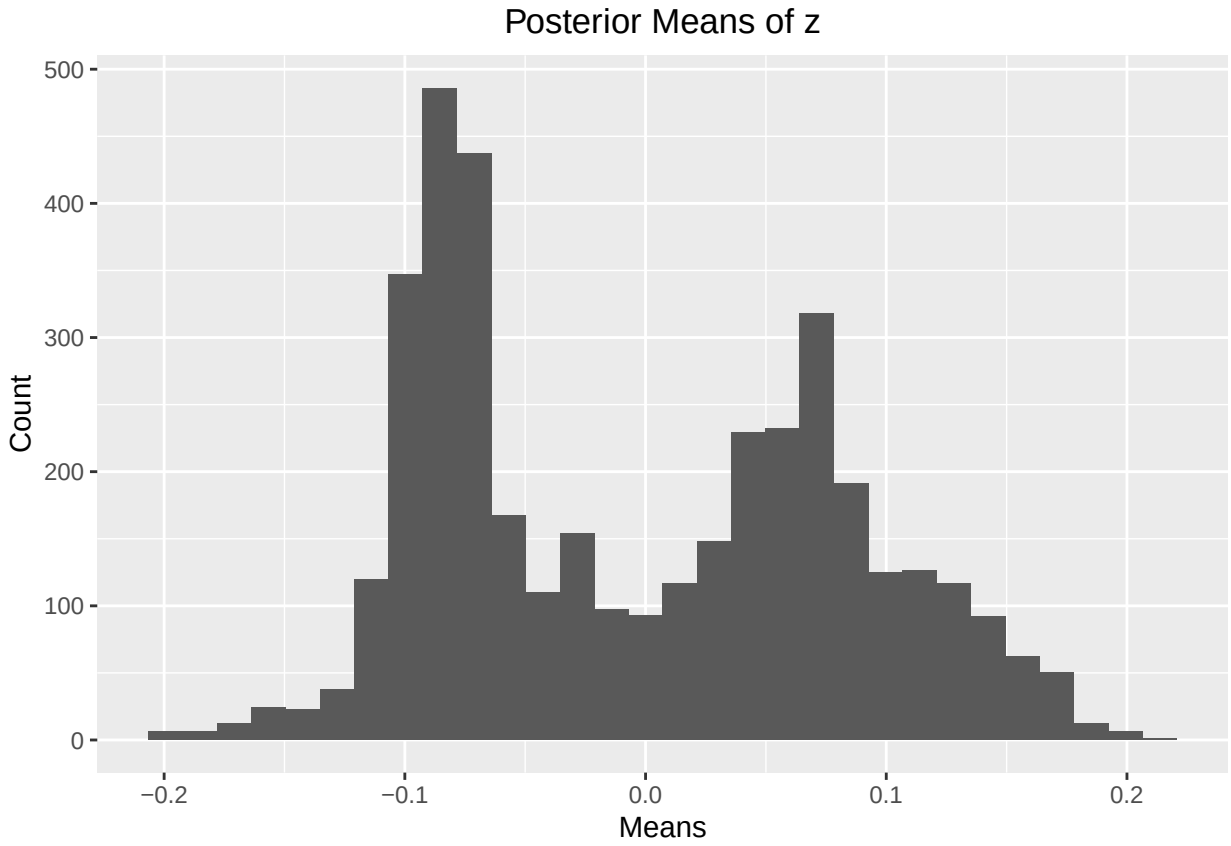
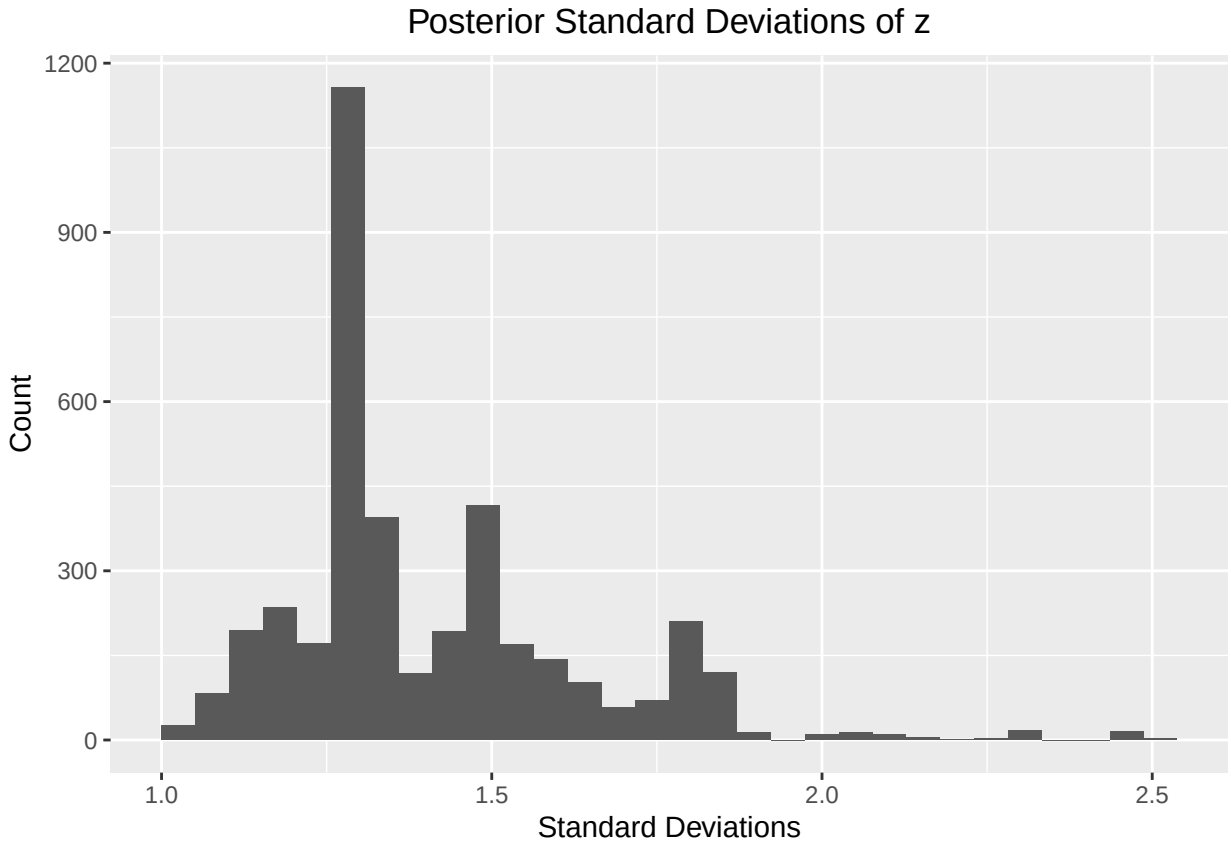


free_beta0[1]
free_beta0[2]
free_beta0[3]
free_beta0[4]
free_beta0[5]
free_beta0[6]
free_beta1
free_beta2
beta0[1]
beta0[2]
beta0[3]
beta0[4]
beta0[5]
beta0[6]
beta0[7]
beta1[1]
beta1[2]
beta1[3]
beta1[4]
beta1[5]
beta1[6]
beta1[7]
beta2[1]
beta2[2]
beta2[3]
beta2[4]
beta2[5]
beta2[6]
beta2[7]
Avg. autocorrelation
Lag
chain
1
2
3
4

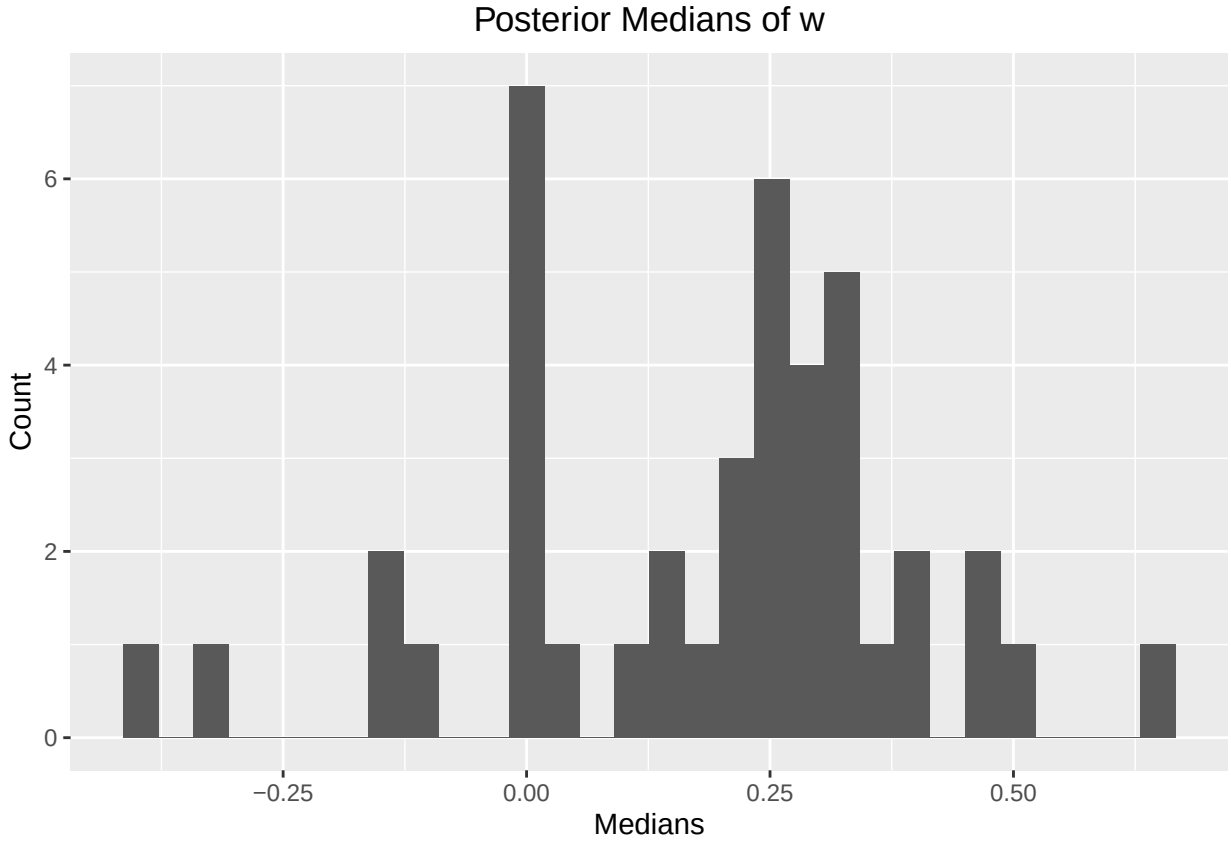



```
## [1] "       "
```

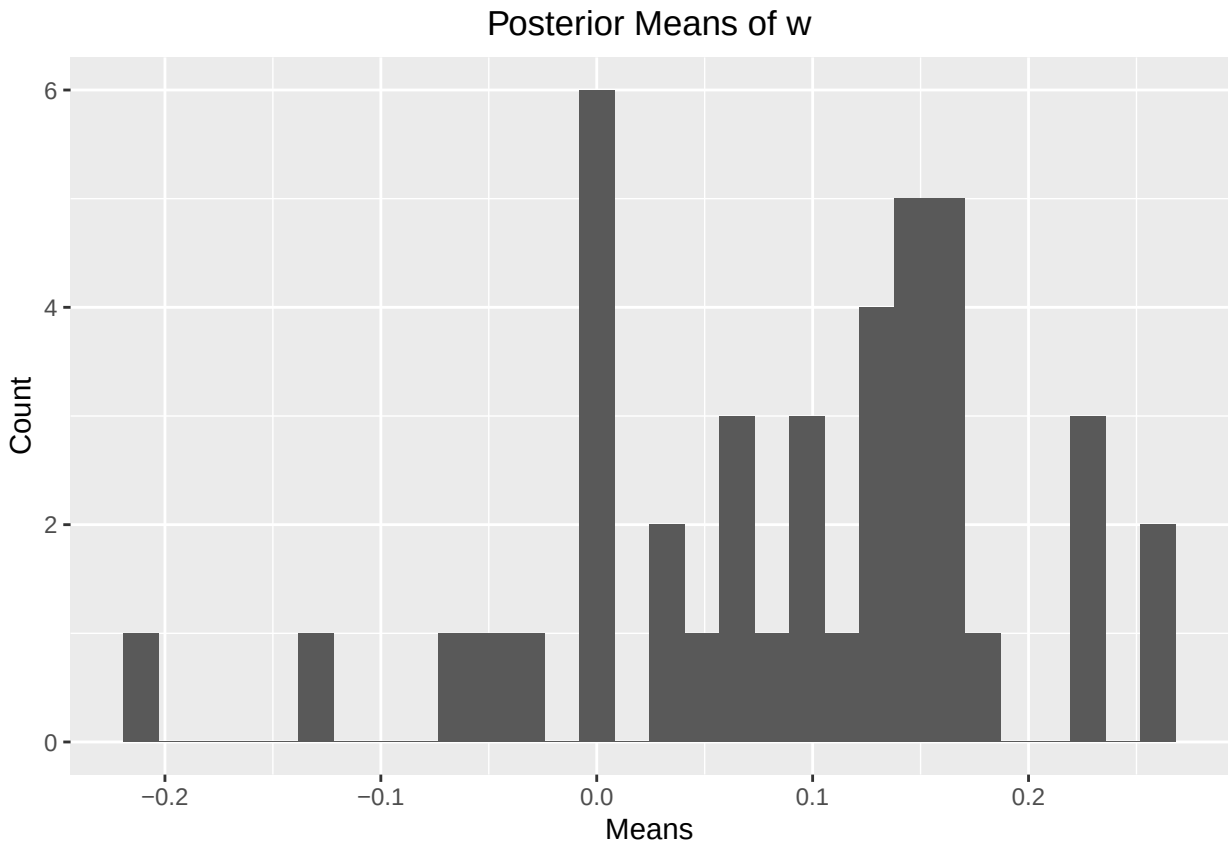

Posterior Means of z
Count
500
400
300
200
100
0
−0.2
−0.1
0.0
0.1
0.2
Means

```
## [1] "      "
```

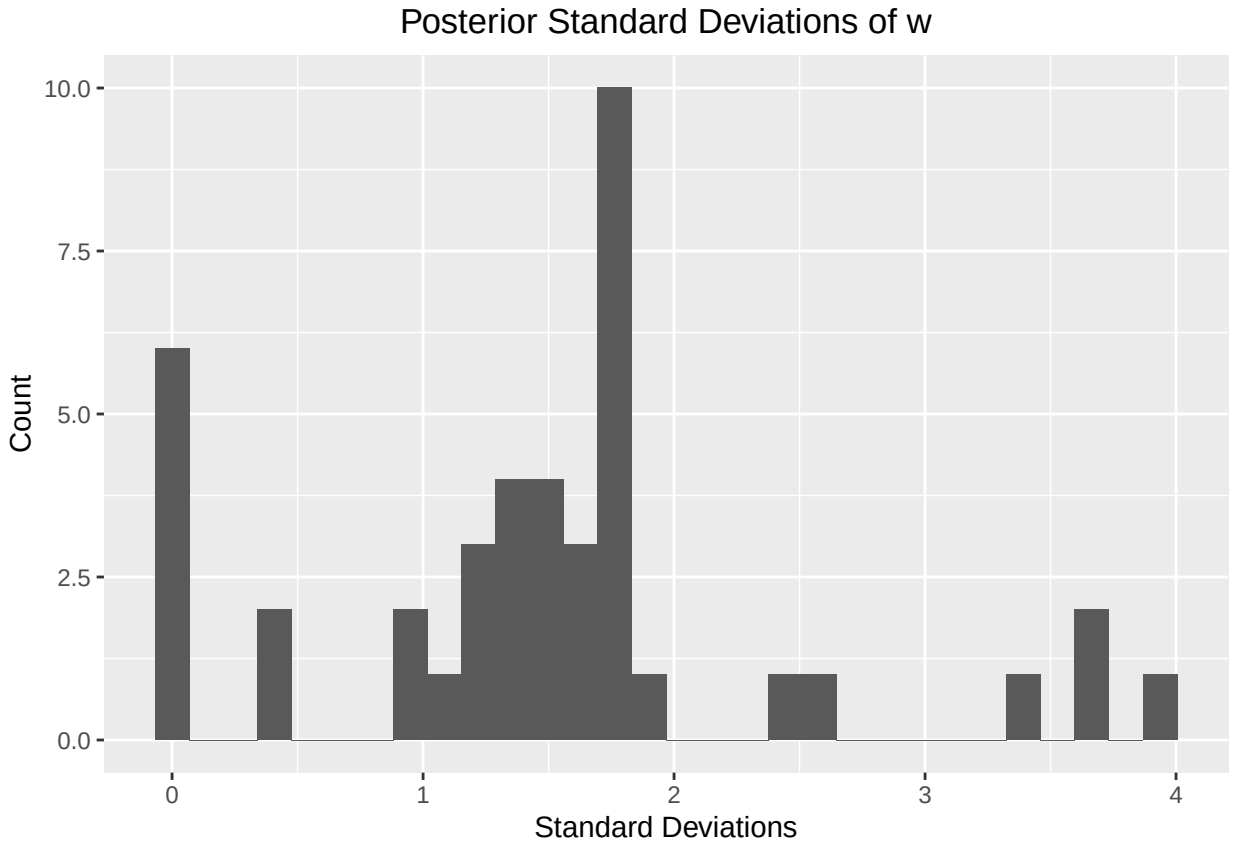

Posterior Standard Deviations of z
1200
900
600
300
0
Count
1.0
1.5
2.0
2.5
Standard Deviations

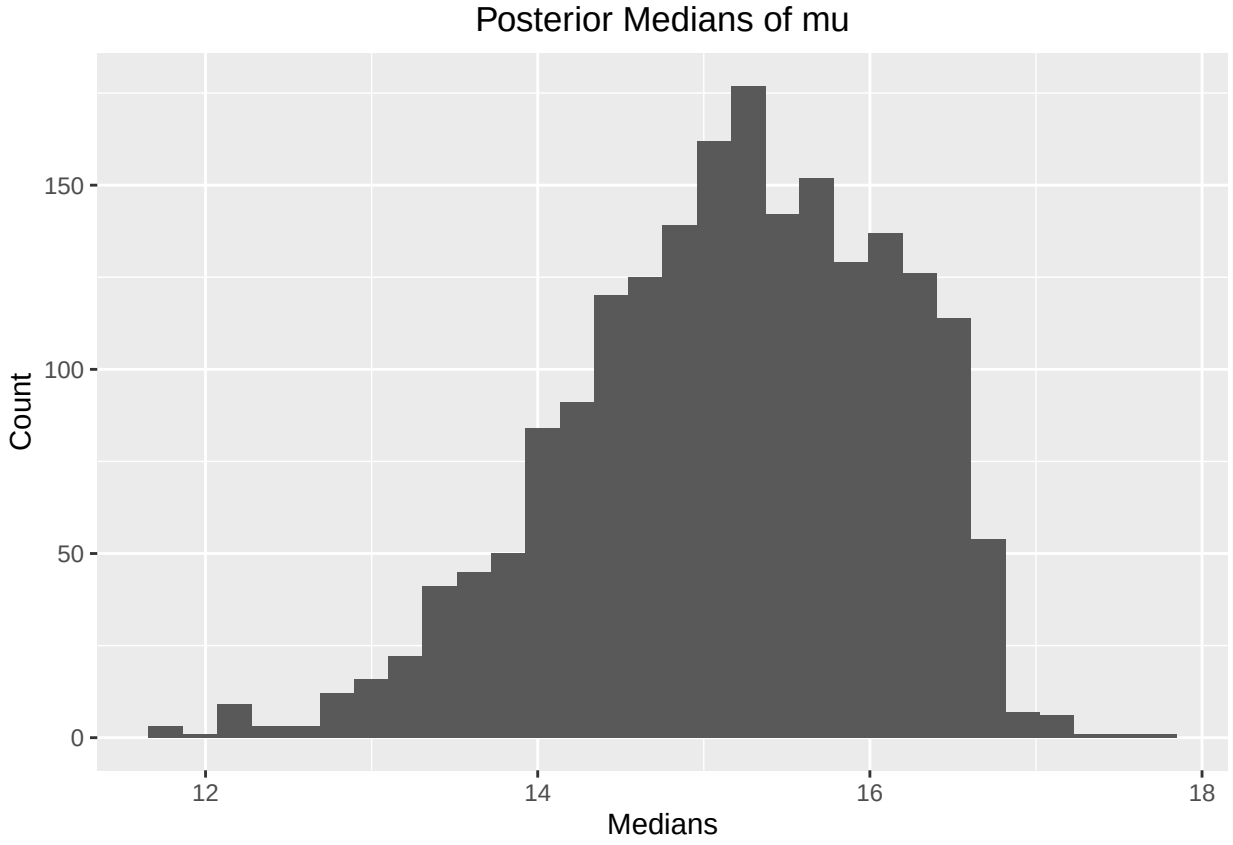

Posterior Medians of w
6
4
2
0
Count
−0.25
0.00
0.25
0.50
Medians

```
## [1] "       "
```

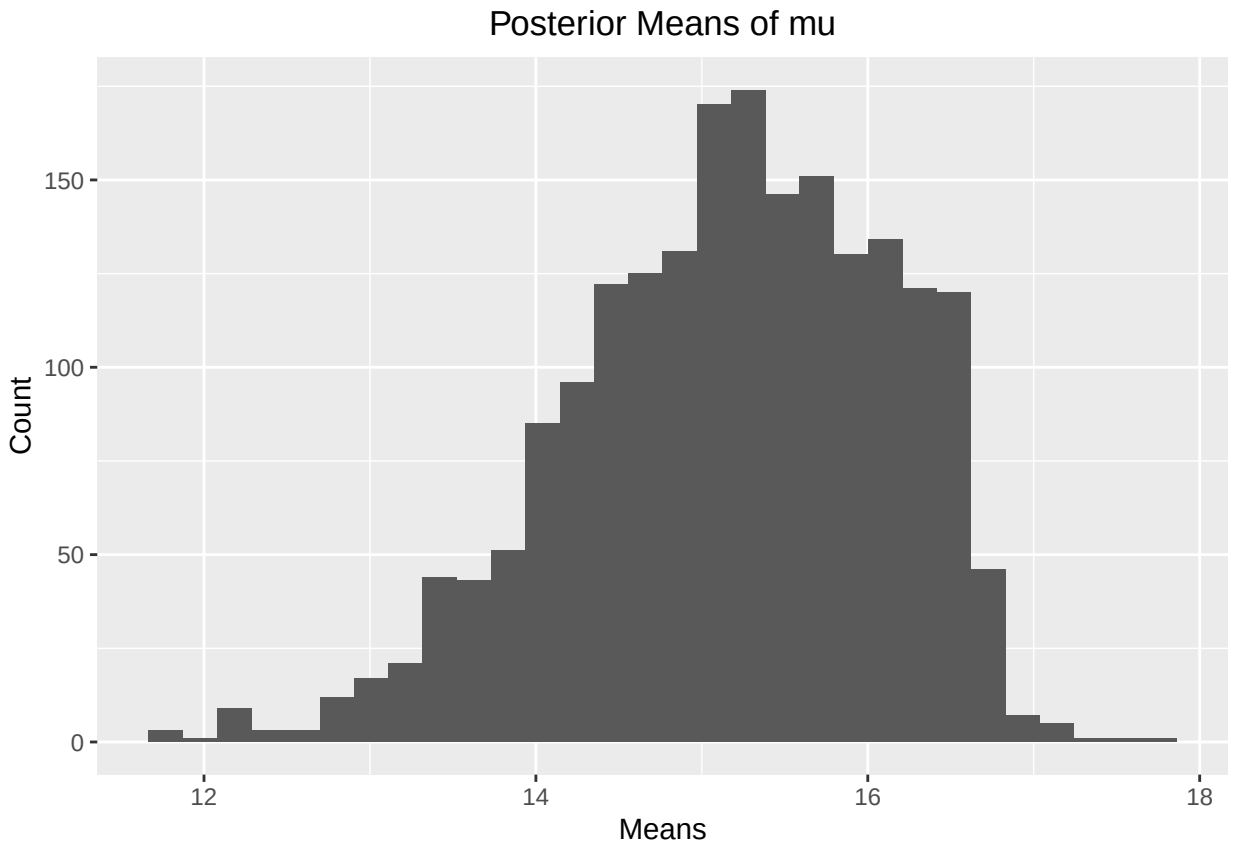



```
## [1] "      "
```

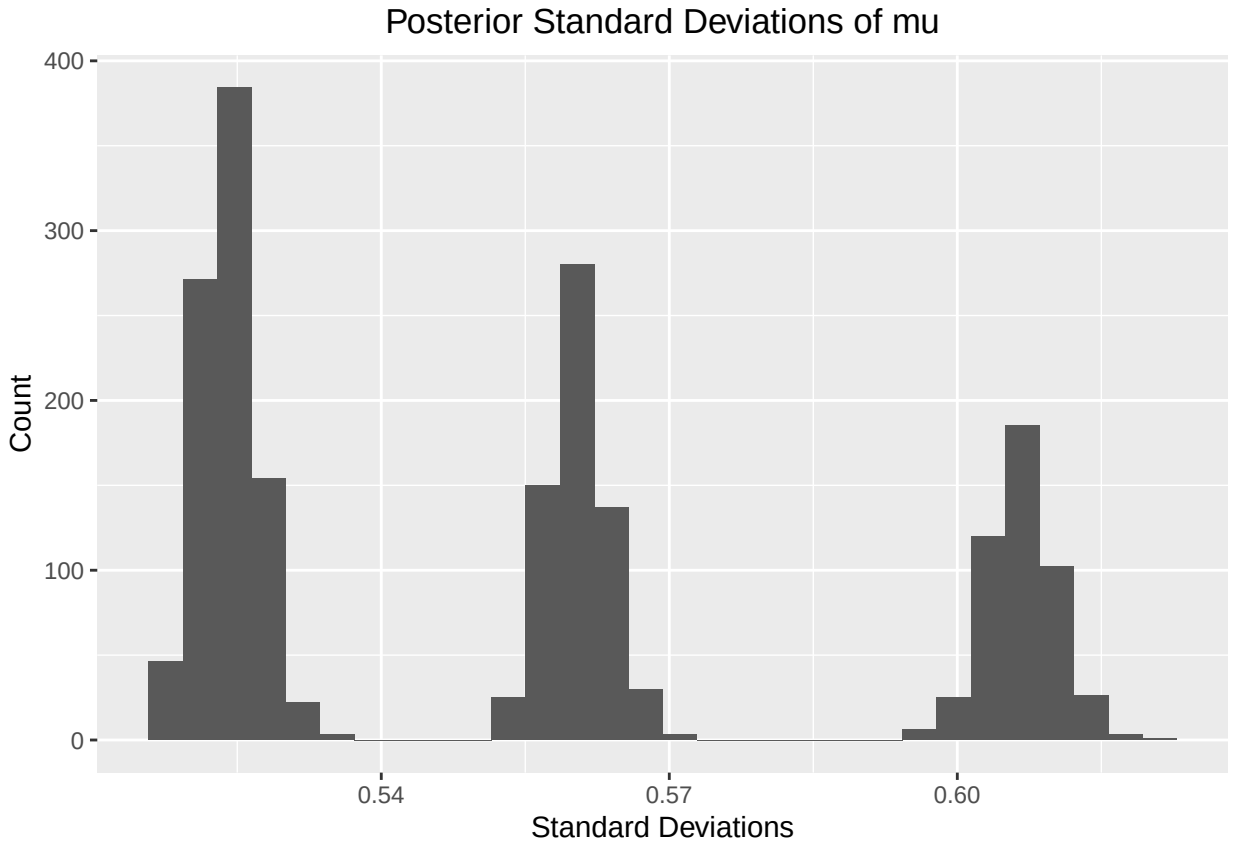

Posterior Standard Deviations of w
Count
10.0
7.5
5.0
2.5
0.0
0
1
2
3
4
Standard Deviations

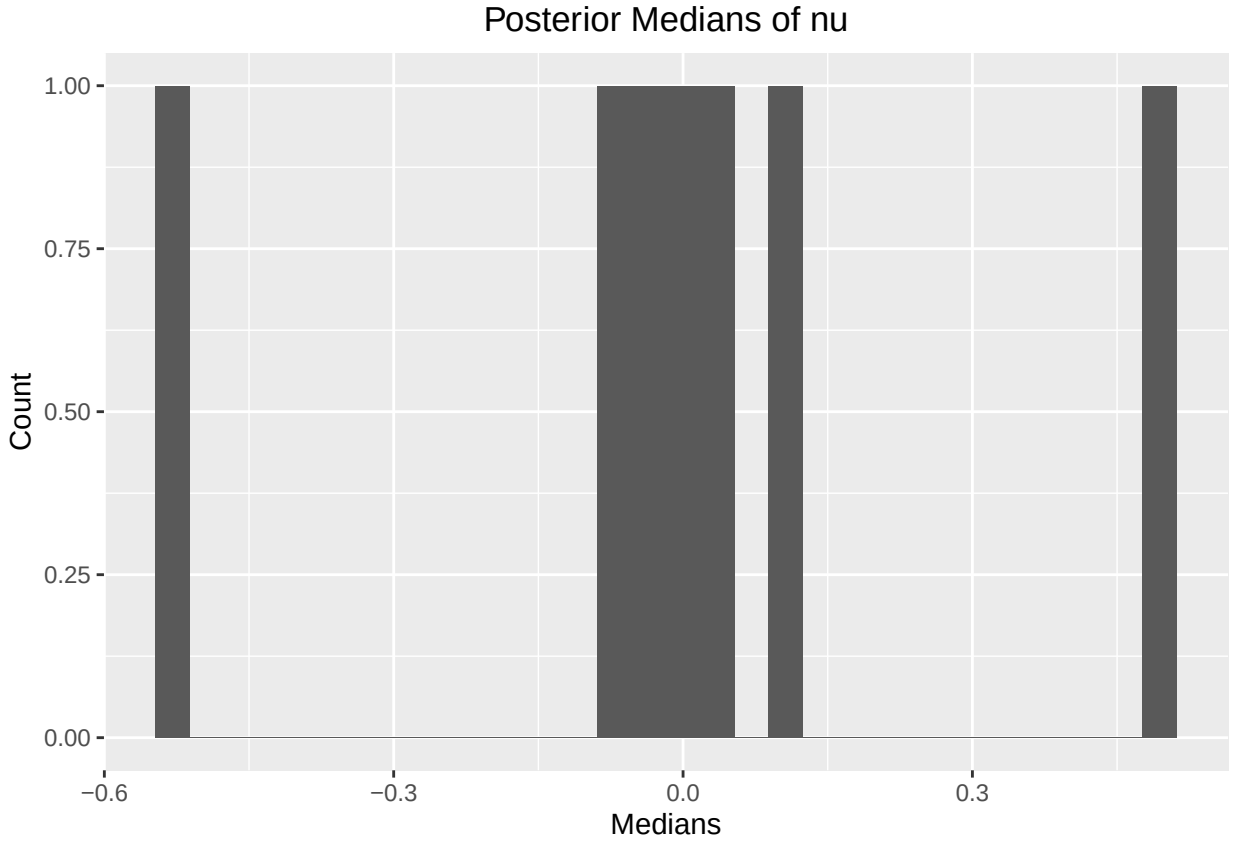

Posterior Medians of mu
Count
150
100
50
0
12
14
16
18
Medians

```
## [1] "       "
```

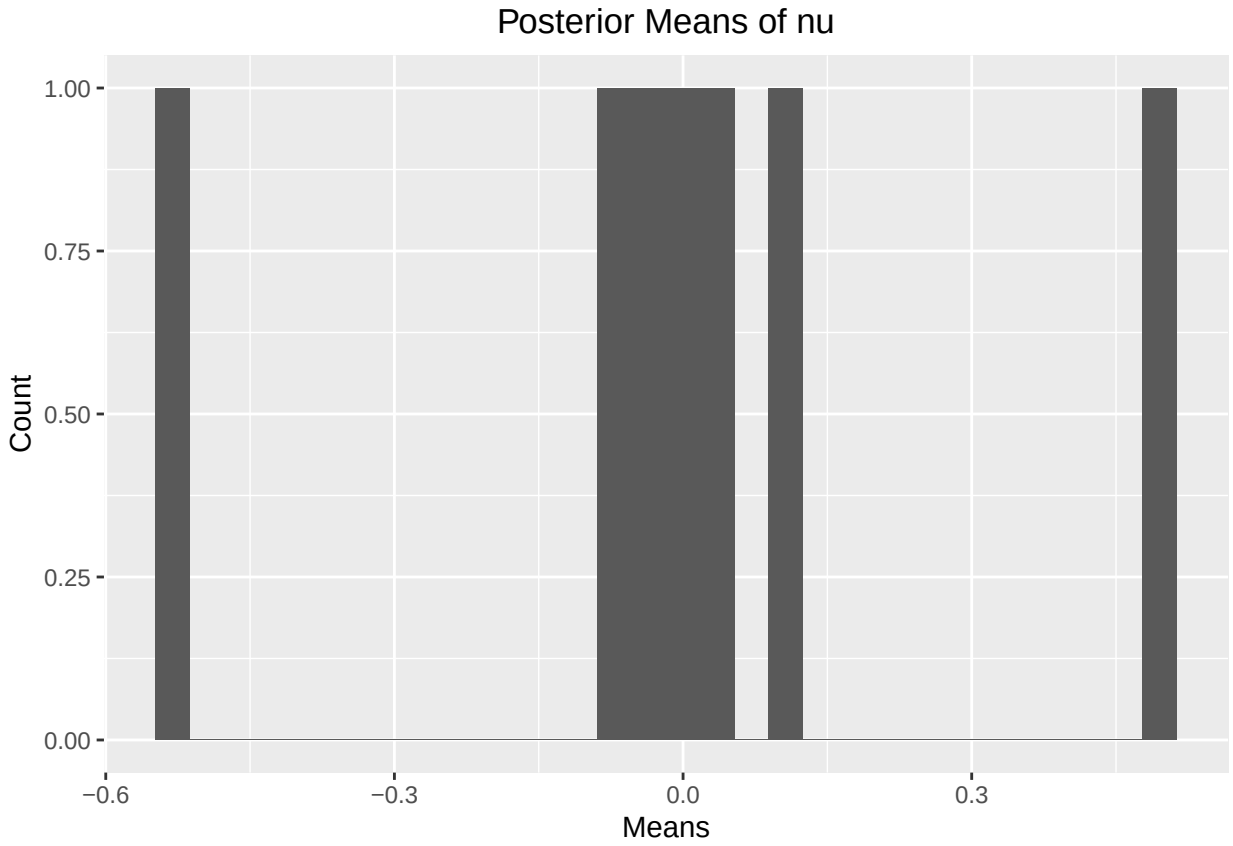



```
## [1] "      "
```

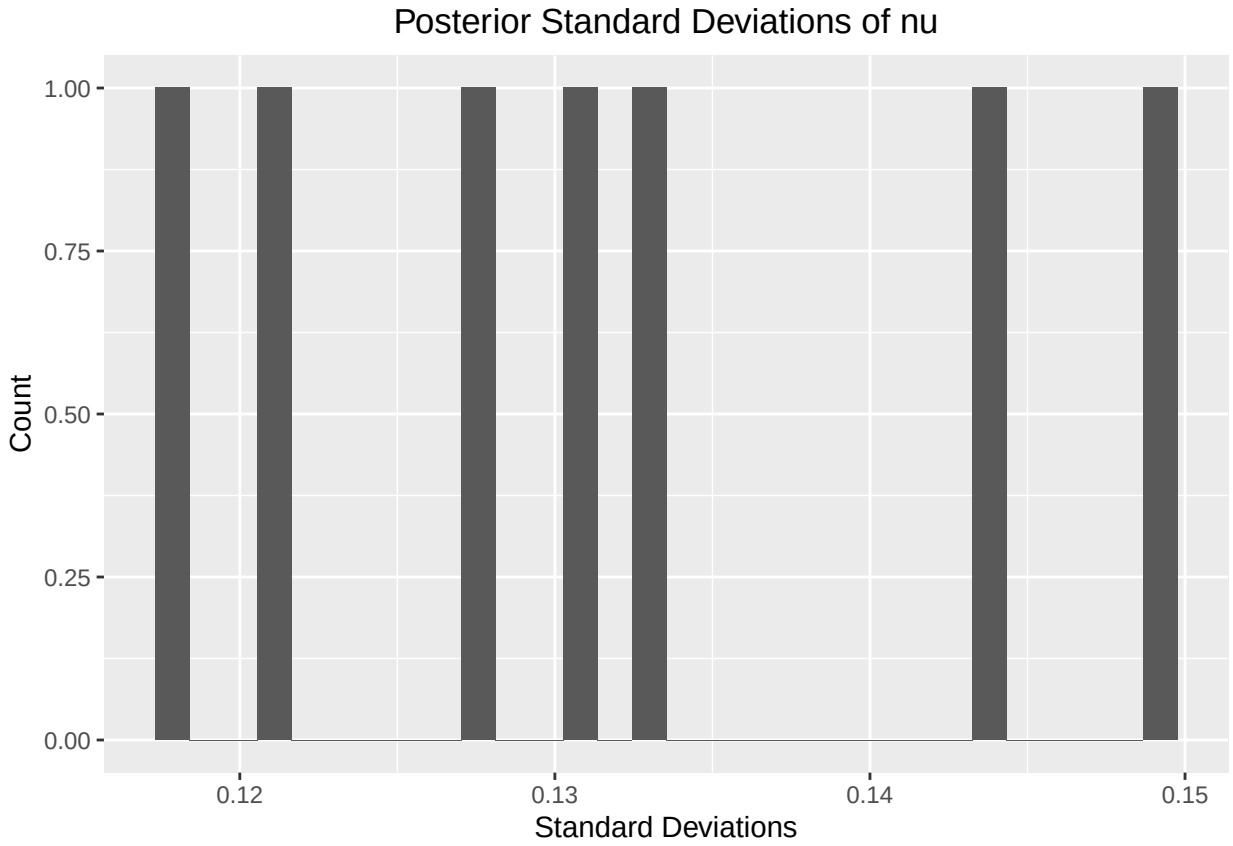

Posterior Standard Deviations of mu
400
300
200
100
0
Count
0.54
0.57
0.60
Standard Deviations

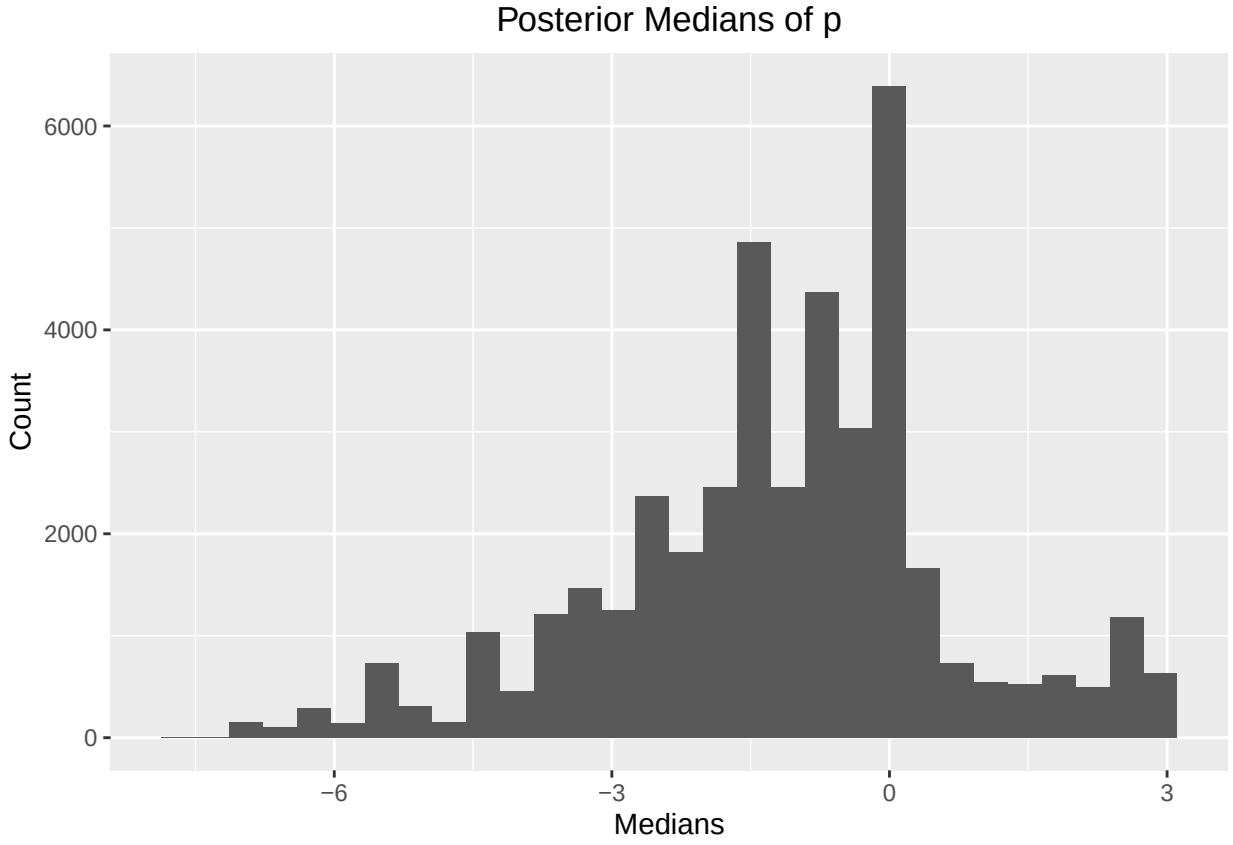

Posterior Medians of nu
1.00
0.75
0.50
0.25
0.00
Count
−0.6
−0.3
0.0
0.3
Medians

```
## [1] "       "
```

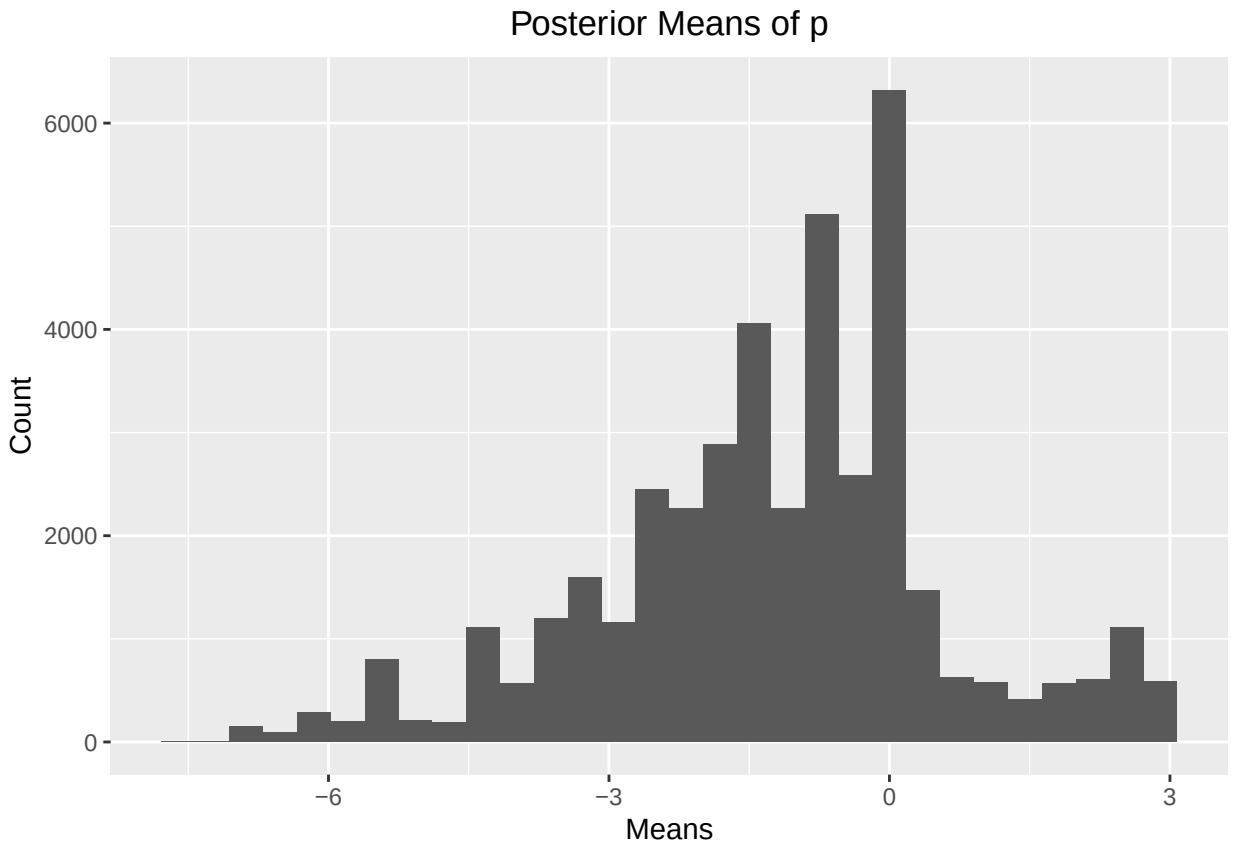

Posterior Means of nu
1.00
0.75
0.50
0.25
0.00
Count
−0.6
−0.3
0.0
0.3
Means

```
## [1] "      "
```

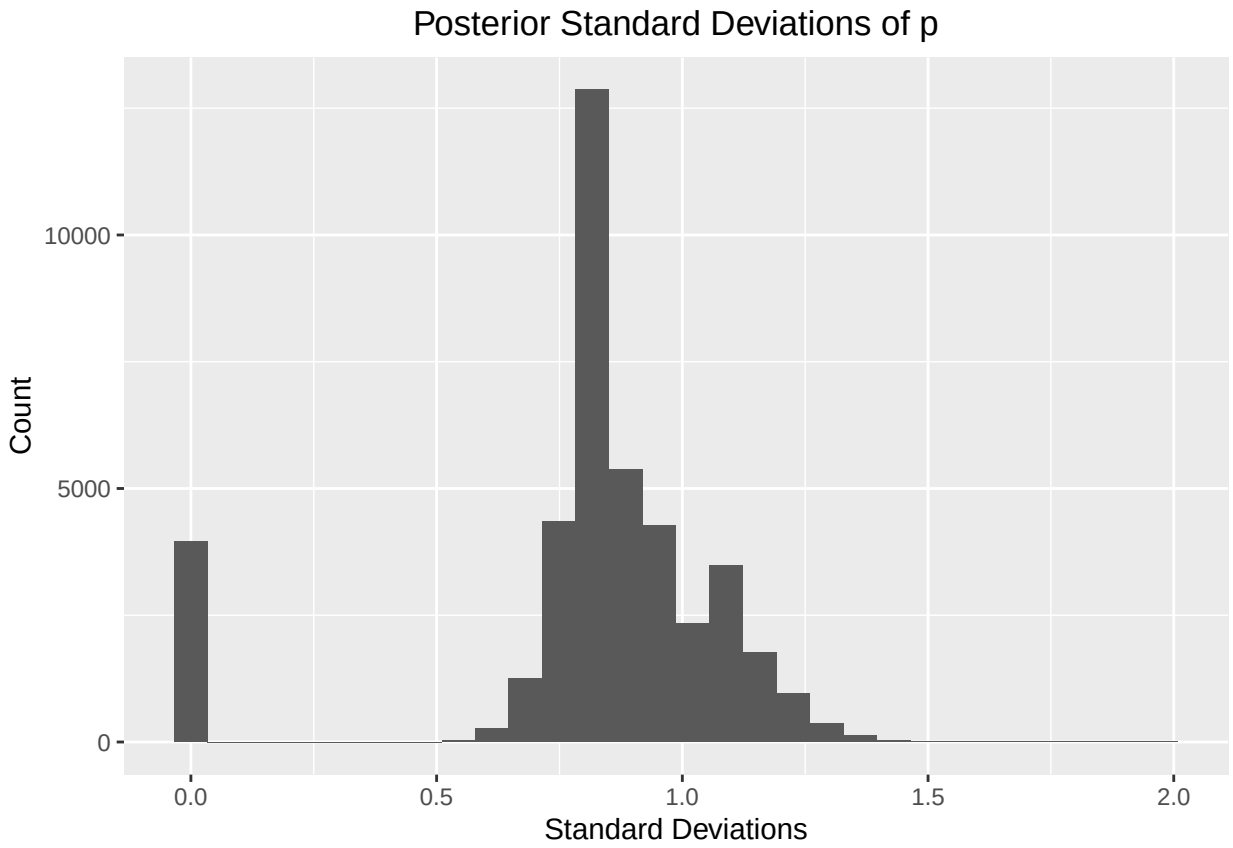

Posterior Standard Deviations of nu
1.00
0.75
0.50
0.25
0.00
Count
0.12
0.13
0.14
0.15
Standard Deviations


Posterior Medians of p
6000
4000
2000
0
Count
−6
−3
0
3
Medians

```
## [1] "       "
```




```
## [1] "      "
```



Histograms for β values and w, and z posterior means across chains.