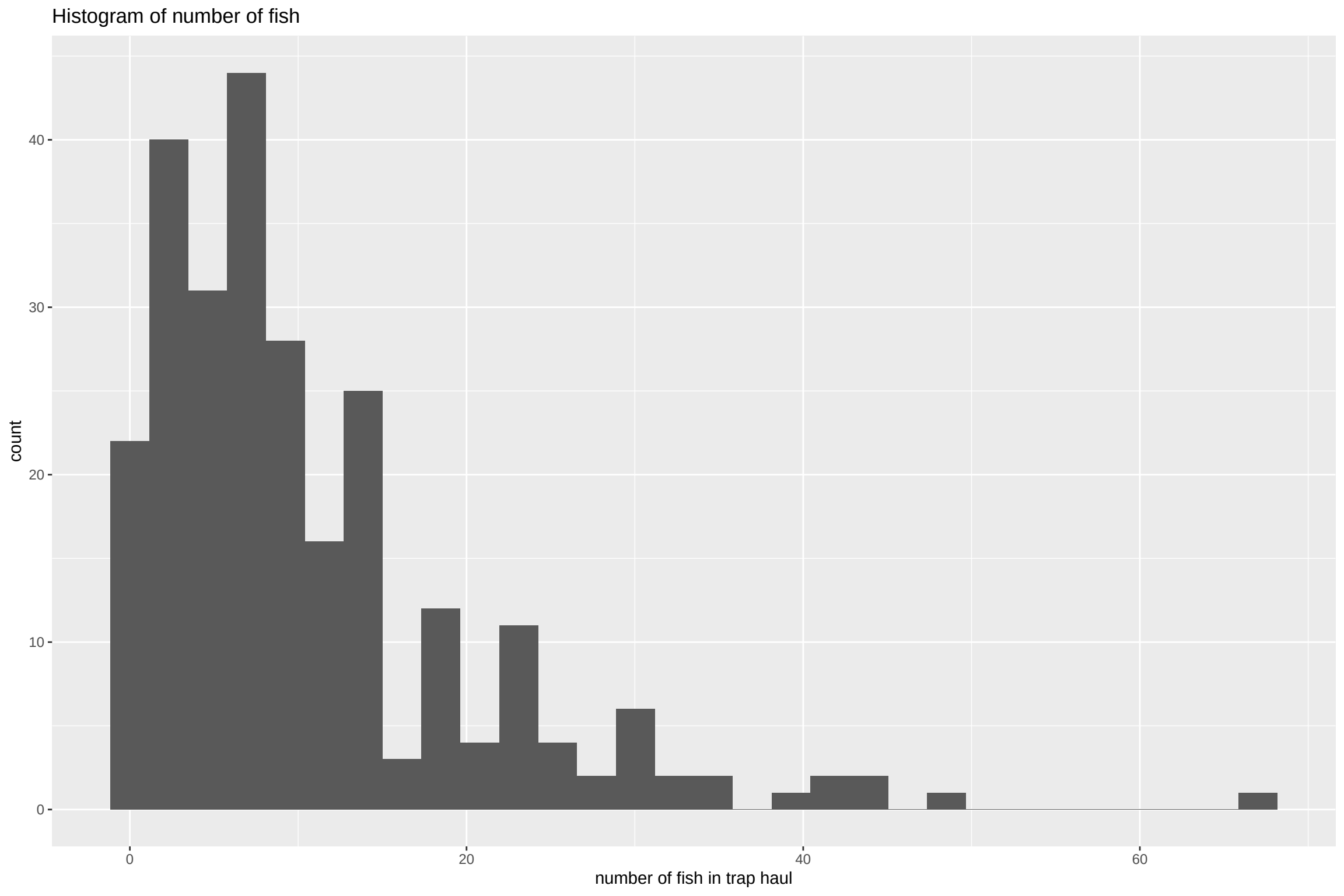
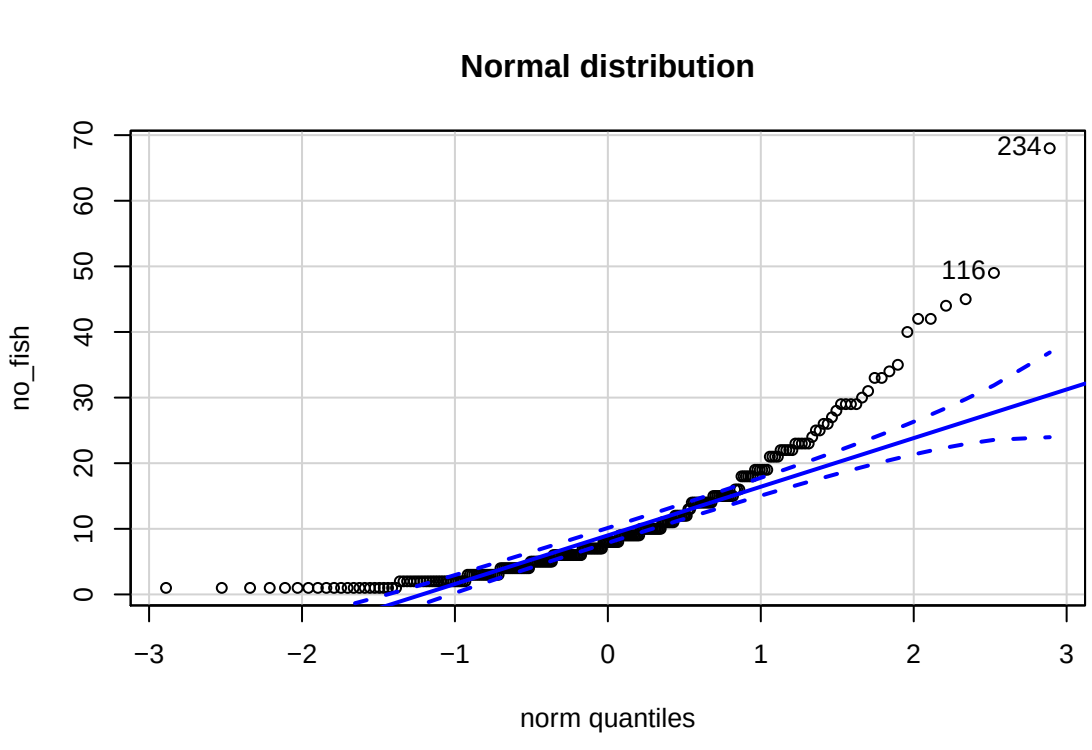
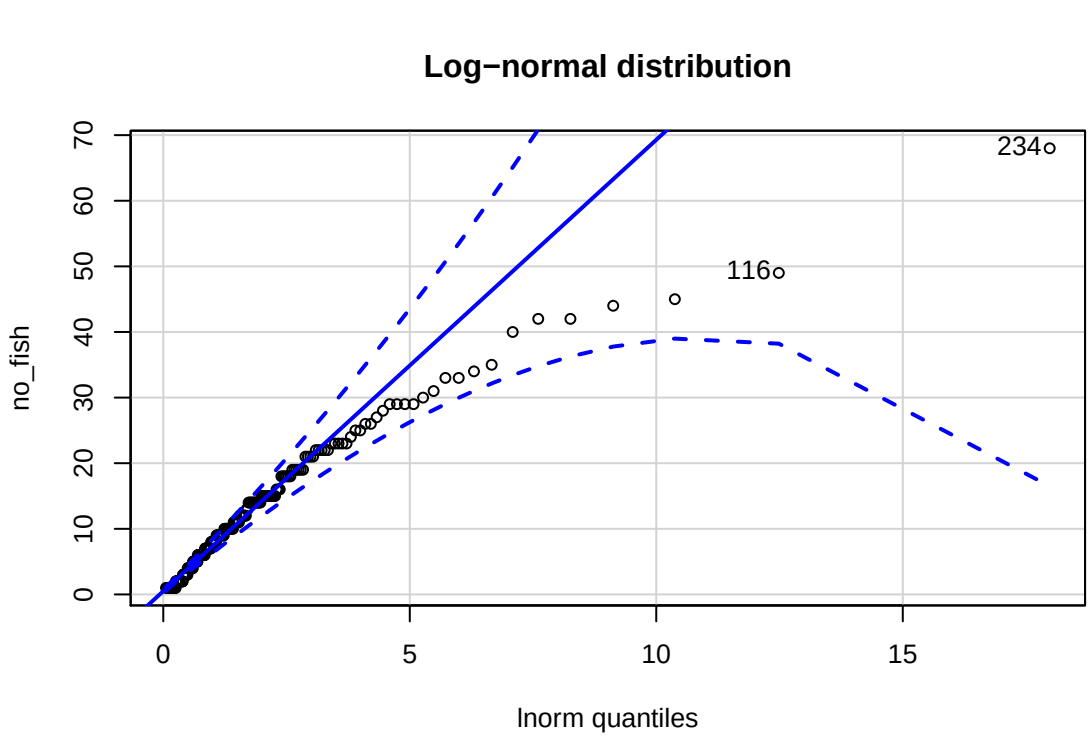
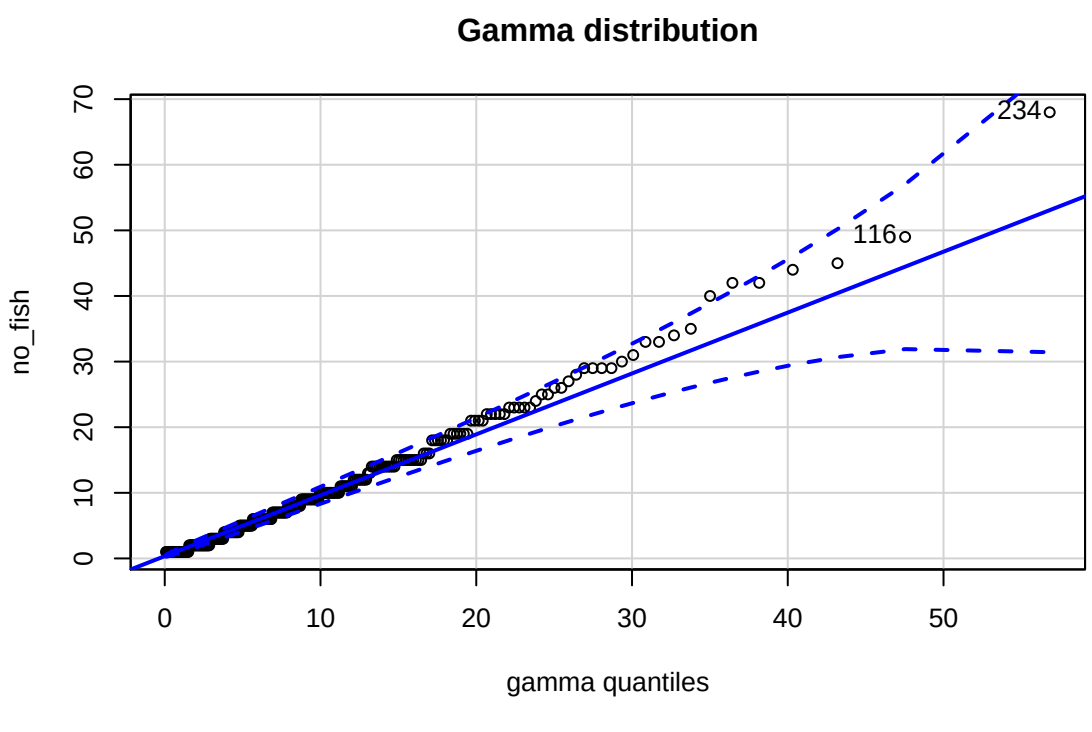
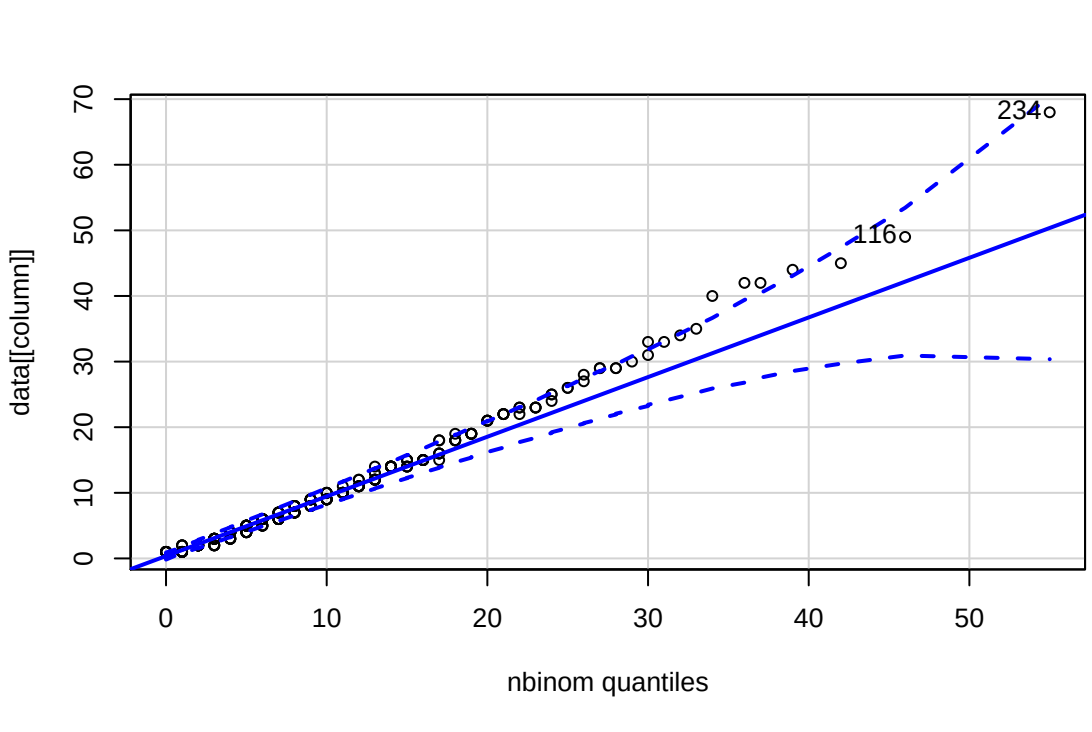
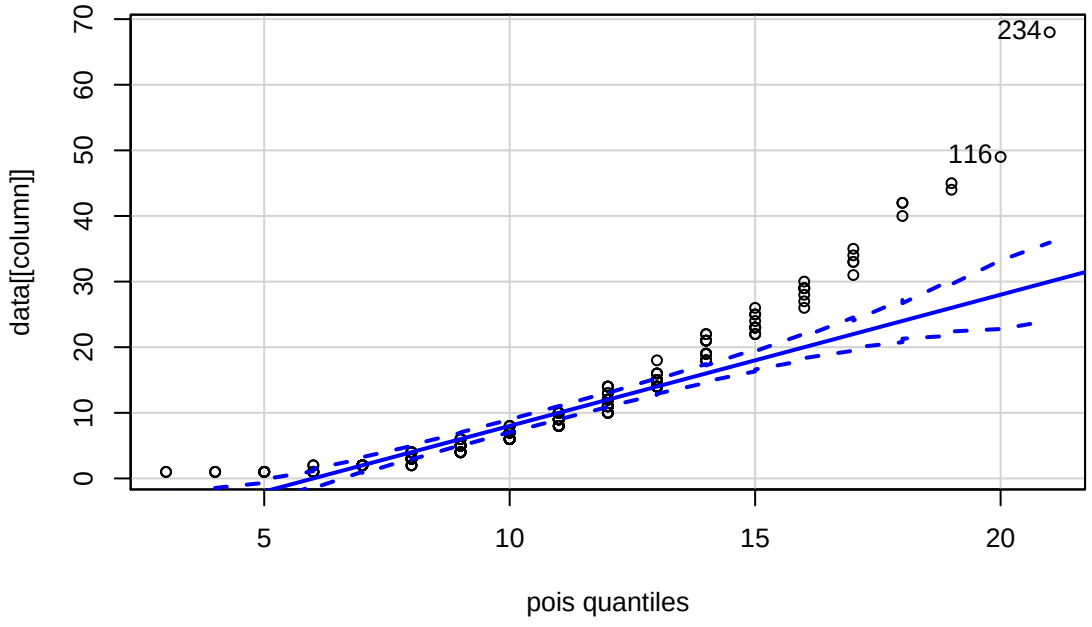

Histogram of number of fish
count
number of fish in trap haul
0
10
20
30
40
0
20
40
60


Normal distribution
no_fish
norm quantiles
234
116


Log−normal distribution
no_fish
lnorm quantiles
234
116

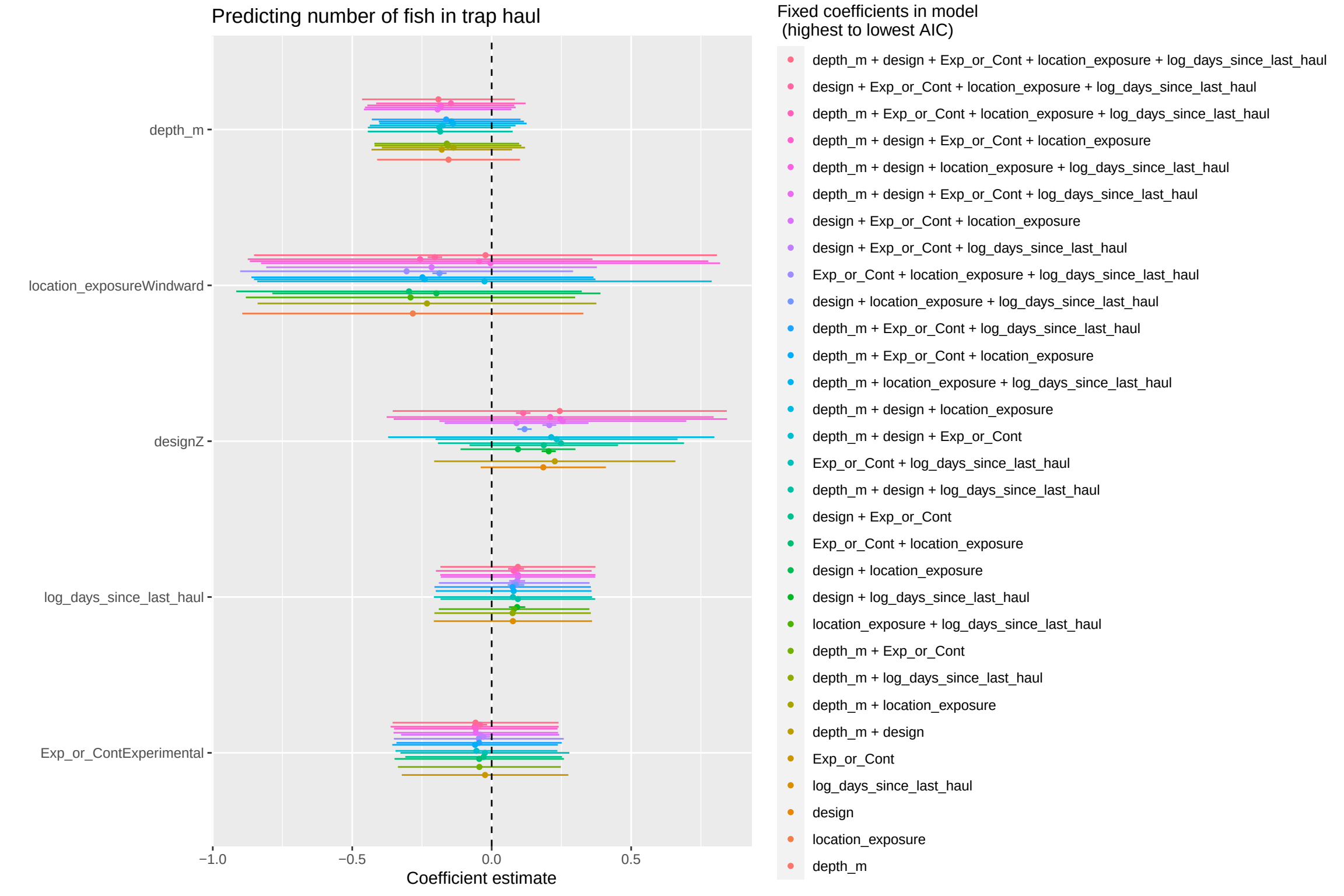

Gamma distribution
no_fish
gamma quantiles
234
116


data[[column]]
nbinom quantiles
234
116


234
116
data[[column]]
pois quantiles
0
10
20
30
40
50
60
70
5
10
15
20

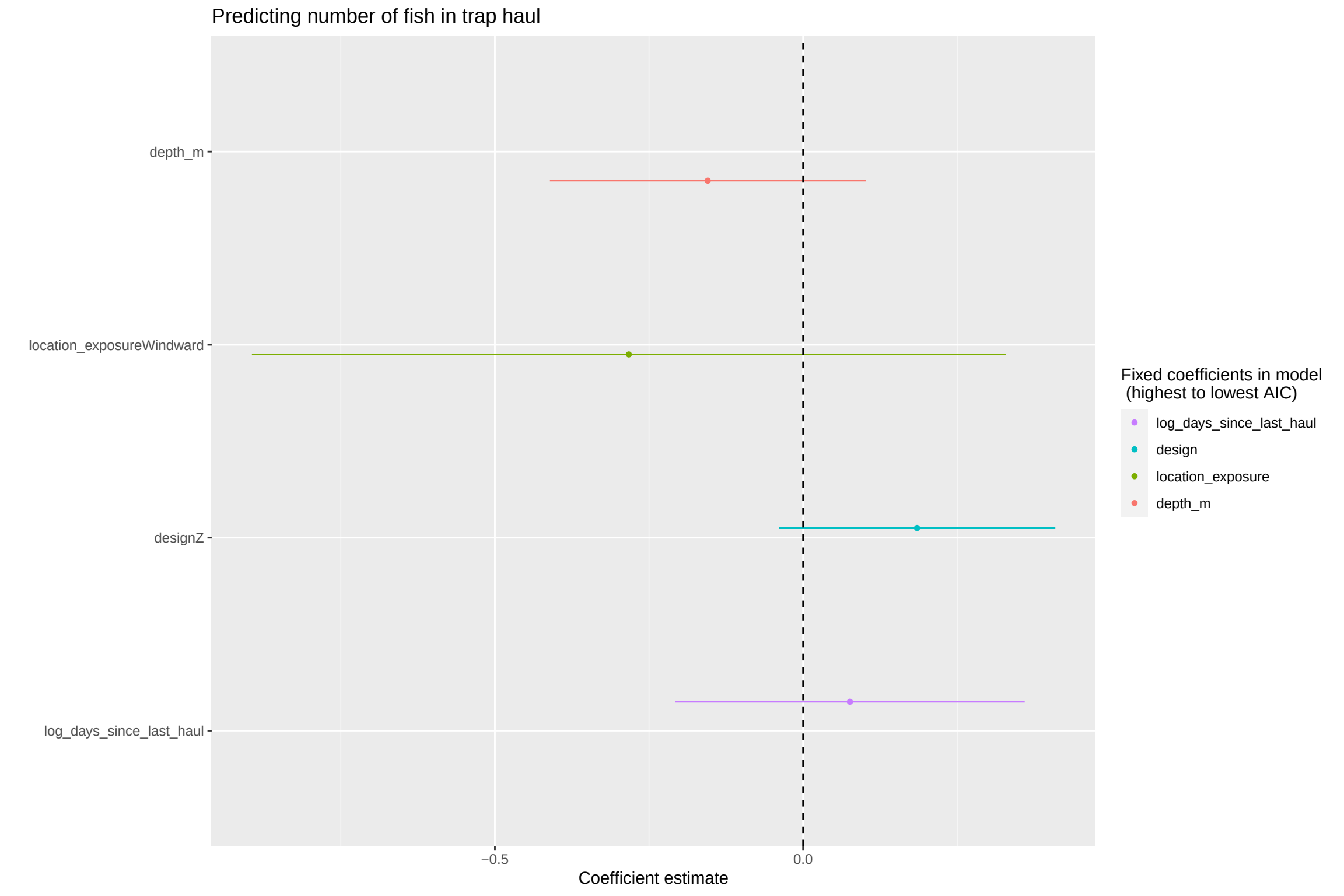
```
Global model call: glmer(formula = no_fish ~ design + log_days_since_last_haul +
    location_exposure + Exp_or_Cont + depth_m + (1 | TrapID) +
    (1 | Date_YMD), data = trap_haul_no_zero_depth, family = negative.binomial(theta = 1.84982325122415),
    control = glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000)),
    na.action = "na.fail")
---
Model selection table
   (Int)     dpt_m dsg Exp_or_Cnt lct_exp log_dys_snc_lst_hal df   logLik   AICc delta weight
1  2.280                                                      4 -867.612 1743.4  0.00  0.146
2  2.530 -0.006953                                            5 -867.092 1744.4  1.04  0.087
9  2.298                                +                     5 -867.209 1744.7  1.27  0.077
3  2.121            +                                         5 -867.278 1744.8  1.41  0.072
17 2.138                                             0.06275  5 -867.473 1745.2  1.80  0.059
5  2.292                          +                          5 -867.600 1745.4  2.06  0.052
4  2.374 -0.008051  +                                         6 -866.586 1745.5  2.12  0.051
10 2.516 -0.006166                      +                    6 -866.818 1746.0  2.59  0.040
18 2.393 -0.007049                                   0.06188  6 -866.953 1746.2  2.86  0.035
6  2.563 -0.007236              +                           6 -867.048 1746.4  3.05  0.032
25 2.149                                +            0.06631  6 -867.052 1746.4  3.06  0.032
19 1.935            +                                0.07519  6 -867.077 1746.5  3.10  0.031
11 2.212            +                +                       6 -867.158 1746.7  3.27  0.028
13 2.322                        +       +                    6 -867.167 1746.7  3.29  0.028
7  2.134            +           +                           6 -867.259 1746.9  3.47  0.026
20 2.189 -0.008303  +                                0.07739  7 -866.364 1747.2  3.79  0.022
21 2.150                        +                    0.06282  6 -867.460 1747.3  3.87  0.021
8  2.411 -0.008444  +           +                           7 -866.517 1747.5  4.10  0.019
12 2.381 -0.007899  +                        +               7 -866.584 1747.6  4.23  0.018
26 2.372 -0.006234                           +        0.06501  7 -866.663 1747.8  4.39  0.016
14 2.561 -0.006499              +            +               7 -866.739 1747.9  4.54  0.015
22 2.427 -0.007340              +                    0.06198  7 -866.908 1748.3  4.88  0.013
27 2.029            +                        +        0.07191  7 -866.974 1748.4  5.01  0.012
29 2.174                        +            +        0.06658  7 -867.009 1748.5  5.08  0.012
23 1.948            +           +                    0.07531  7 -867.057 1748.6  5.18  0.011
15 2.239            +           +            +               7 -867.122 1748.7  5.31  0.010
24 2.227 -0.008715  +           +                    0.07793  8 -866.291 1749.2  5.78  0.008
28 2.191 -0.008277  +                        +        0.07732  8 -866.364 1749.3  5.92  0.008
16 2.427 -0.008204  +           +            +               8 -866.512 1749.6  6.22  0.007
30 2.417 -0.006576              +            +        0.06538  8 -866.582 1749.7  6.36  0.006
31 2.056            +           +            +        0.07197  8 -866.938 1750.5  7.07  0.004
32 2.235 -0.008586  +           +            +        0.07752  9 -866.290 1751.3  7.92  0.003
Models ranked by AICc(x)
Random terms (all models):
...1 | TrapID..., ...1 | Date_YMD...
```

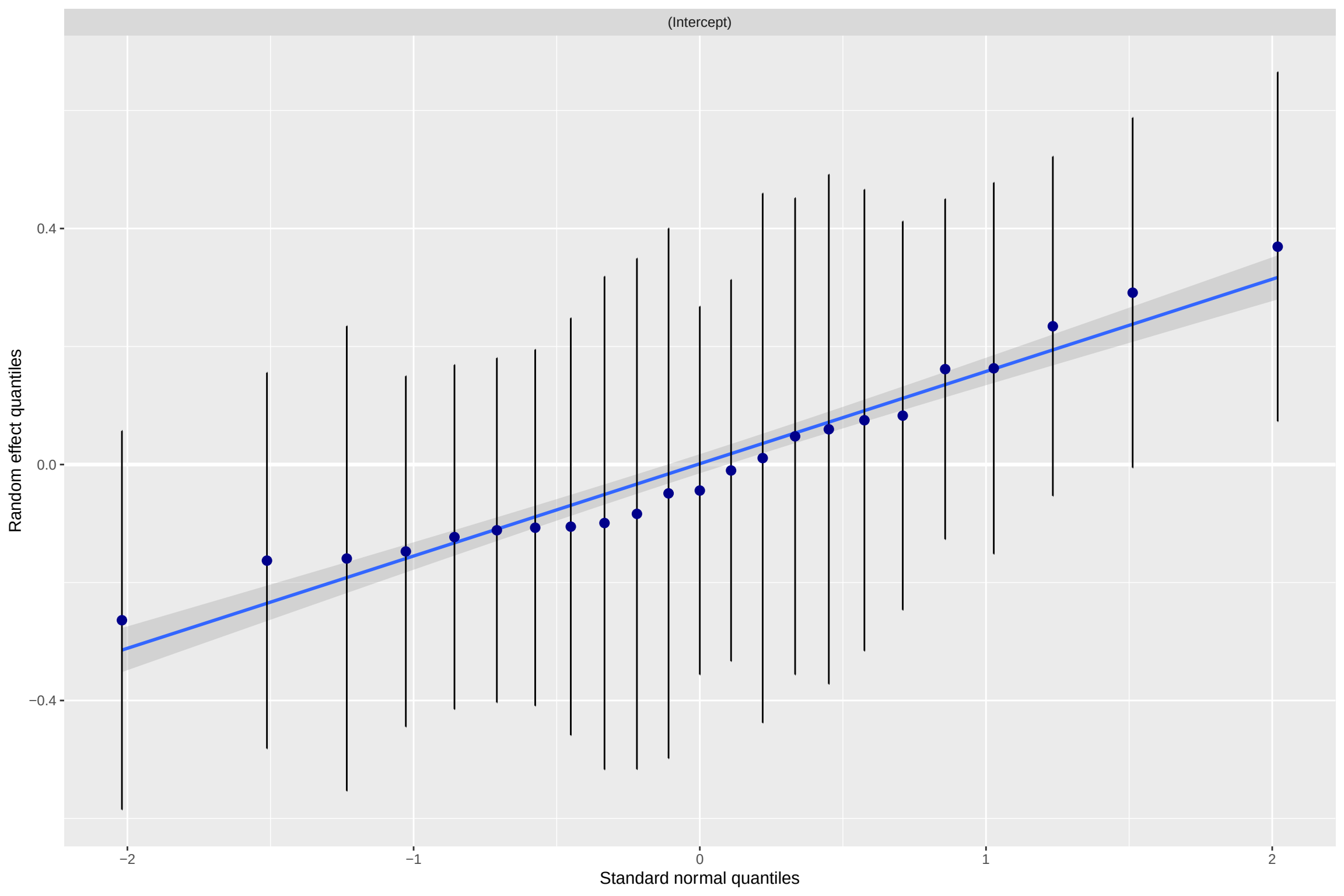
model	sigma	logLik	AIC	BIC	deviance	df.residual
none	1.00	−867.61	1743.22	1757.45	252.56	255.00
depth_m	1.00	−867.09	1744.18	1761.97	254.53	254.00
location_exposure	1.00	−867.21	1744.42	1762.20	251.95	254.00
design	1.00	−867.28	1744.56	1762.34	252.80	254.00
log_days_since_last_haul	1.00	−867.47	1744.95	1762.73	251.74	254.00
Exp_or_Cont	1.00	−867.60	1745.20	1762.98	252.48	254.00
depth_m + design	1.00	−866.59	1745.17	1766.51	255.18	253.00
depth_m + location_exposure	1.00	−866.82	1745.64	1766.98	253.91	253.00
depth_m + log_days_since_last_haul	1.00	−866.95	1745.91	1767.25	253.67	253.00
depth_m + Exp_or_Cont	1.00	−867.05	1746.10	1767.44	254.41	253.00
location_exposure + log_days_since_last_haul	1.00	−867.05	1746.10	1767.45	251.15	253.00
design + log_days_since_last_haul	1.00	−867.08	1746.15	1767.49	251.96	253.00
design + location_exposure	1.00	−867.16	1746.32	1767.66	252.23	253.00
Exp_or_Cont + location_exposure	1.00	−867.17	1746.33	1767.68	251.76	253.00
design + Exp_or_Cont	1.00	−867.26	1746.52	1767.86	252.70	253.00
depth_m + design + log_days_since_last_haul	1.00	−866.36	1746.73	1771.63	254.31	252.00
Exp_or_Cont + log_days_since_last_haul	1.00	−867.46	1746.92	1768.26	251.66	253.00
depth_m + design + Exp_or_Cont	1.00	−866.52	1747.03	1771.93	255.03	252.00
depth_m + design + location_exposure	1.00	−866.58	1747.17	1772.07	255.06	252.00
depth_m + location_exposure + log_days_since_last_haul	1.00	−866.66	1747.33	1772.22	253.06	252.00
depth_m + Exp_or_Cont + location_exposure	1.00	−866.74	1747.48	1772.38	253.70	252.00
depth_m + Exp_or_Cont + log_days_since_last_haul	1.00	−866.91	1747.82	1772.71	253.55	252.00
design + location_exposure + log_days_since_last_haul	1.00	−866.97	1747.95	1772.85	251.46	252.00
Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	−867.01	1748.02	1772.92	250.96	252.00
design + Exp_or_Cont + log_days_since_last_haul	1.00	−867.06	1748.11	1773.01	251.86	252.00
design + Exp_or_Cont + location_exposure	1.00	−867.12	1748.24	1773.14	252.04	252.00
depth_m + design + Exp_or_Cont + log_days_since_last_haul	1.00	−866.29	1748.58	1777.04	254.17	251.00
depth_m + design + location_exposure + log_days_since_last_haul	1.00	−866.36	1748.73	1777.18	254.30	251.00
depth_m + design + Exp_or_Cont + location_exposure	1.00	−866.51	1749.02	1777.48	254.84	251.00
depth_m + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	−866.58	1749.16	1777.62	252.85	251.00
design + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	−866.94	1749.88	1778.33	251.27	251.00
depth_m + design + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	−866.29	1750.58	1782.59	254.07	250.00

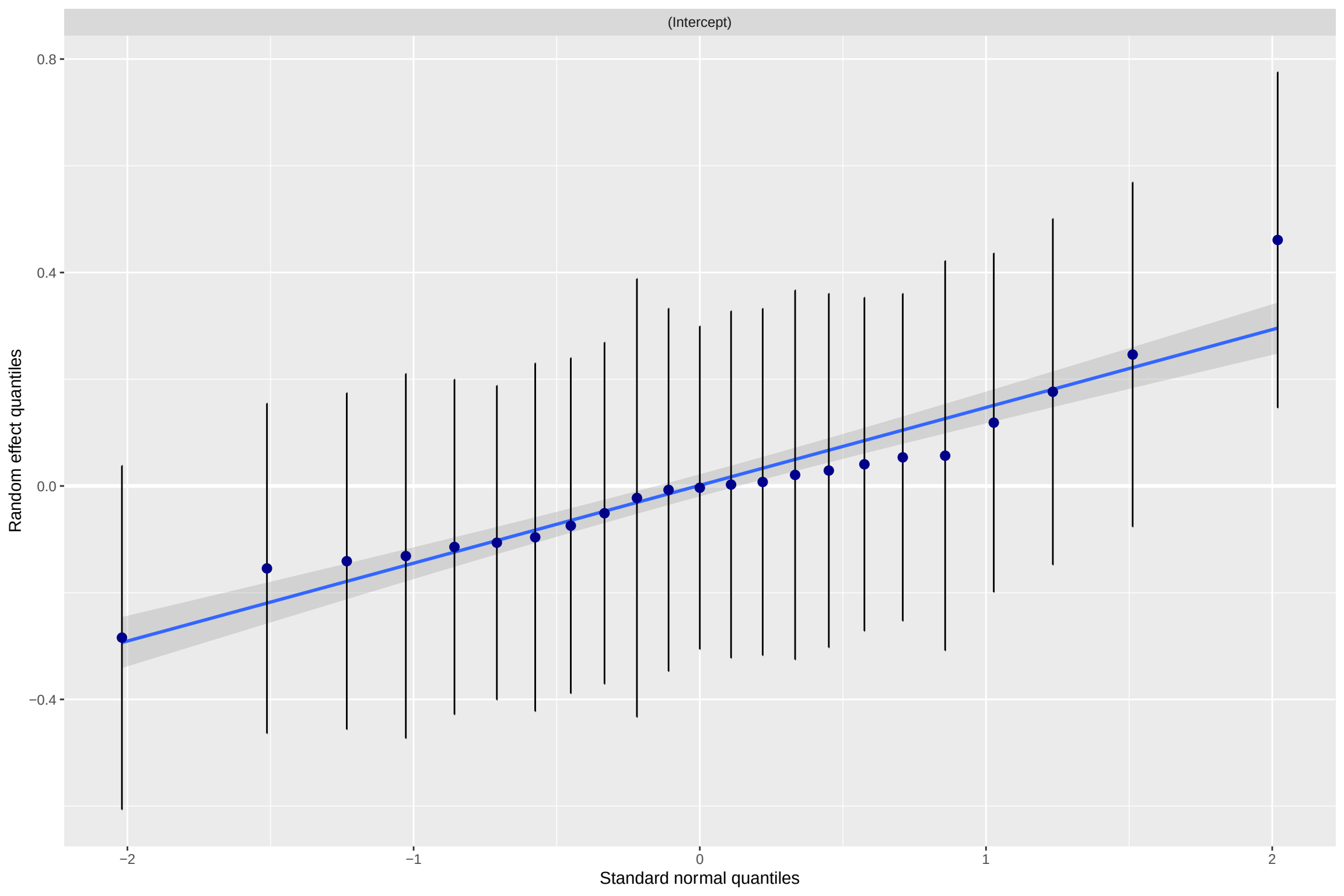

Predicting number of fish in trap haul
depth_m
location_exposureWindward
designZ
log_days_since_last_haul
Exp_or_ContExperimental
−1.0
−0.5
0.0
0.5
Coefficient estimate
Fixed coefficients in model
(highest to lowest AIC)
depth_m + design + Exp_or_Cont + location_exposure + log_days_since_last_haul
design + Exp_or_Cont + location_exposure + log_days_since_last_haul
depth_m + Exp_or_Cont + location_exposure + log_days_since_last_haul
depth_m + design + Exp_or_Cont + location_exposure
depth_m + design + location_exposure + log_days_since_last_haul
depth_m + design + Exp_or_Cont + log_days_since_last_haul
design + Exp_or_Cont + location_exposure
design + Exp_or_Cont + log_days_since_last_haul
Exp_or_Cont + location_exposure + log_days_since_last_haul
design + location_exposure + log_days_since_last_haul
depth_m + Exp_or_Cont + log_days_since_last_haul
depth_m + Exp_or_Cont + location_exposure
depth_m + location_exposure + log_days_since_last_haul
depth_m + design + location_exposure
depth_m + design + Exp_or_Cont
Exp_or_Cont + log_days_since_last_haul
depth_m + design + log_days_since_last_haul
design + Exp_or_Cont
Exp_or_Cont + location_exposure
design + location_exposure
design + log_days_since_last_haul
location_exposure + log_days_since_last_haul
depth_m + Exp_or_Cont
depth_m + log_days_since_last_haul
depth_m + location_exposure
depth_m + design
Exp_or_Cont
log_days_since_last_haul
design
location_exposure
depth_m

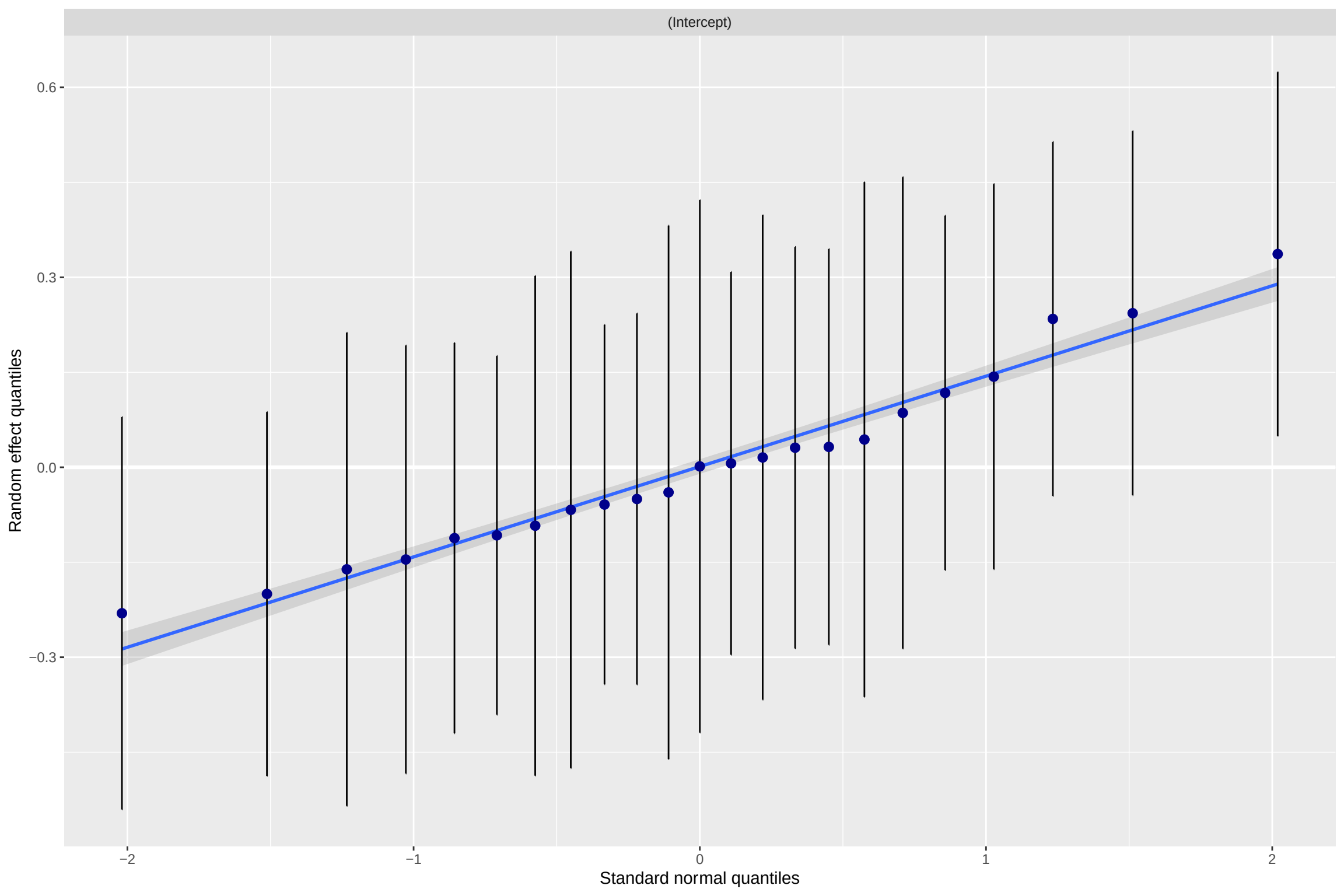
Models with delta AIC <2

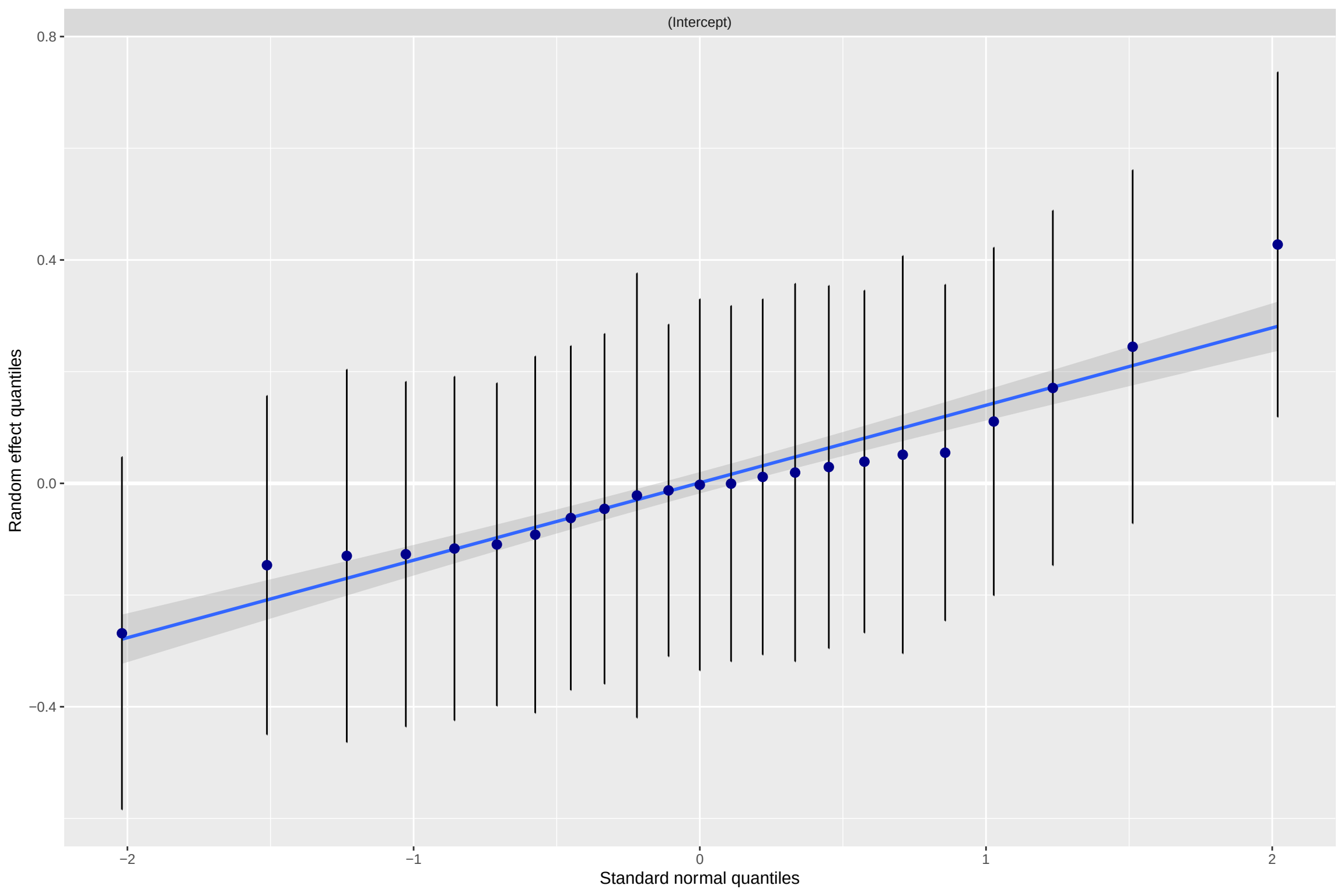
model	sigma	logLik	AIC	BIC	deviance	df.residual
none	1.00	−867.61	1743.22	1757.45	252.56	255.00
depth_m	1.00	−867.09	1744.18	1761.97	254.53	254.00
location_exposure	1.00	−867.21	1744.42	1762.20	251.95	254.00
design	1.00	−867.28	1744.56	1762.34	252.80	254.00
log_days_since_last_haul	1.00	−867.47	1744.95	1762.73	251.74	254.00

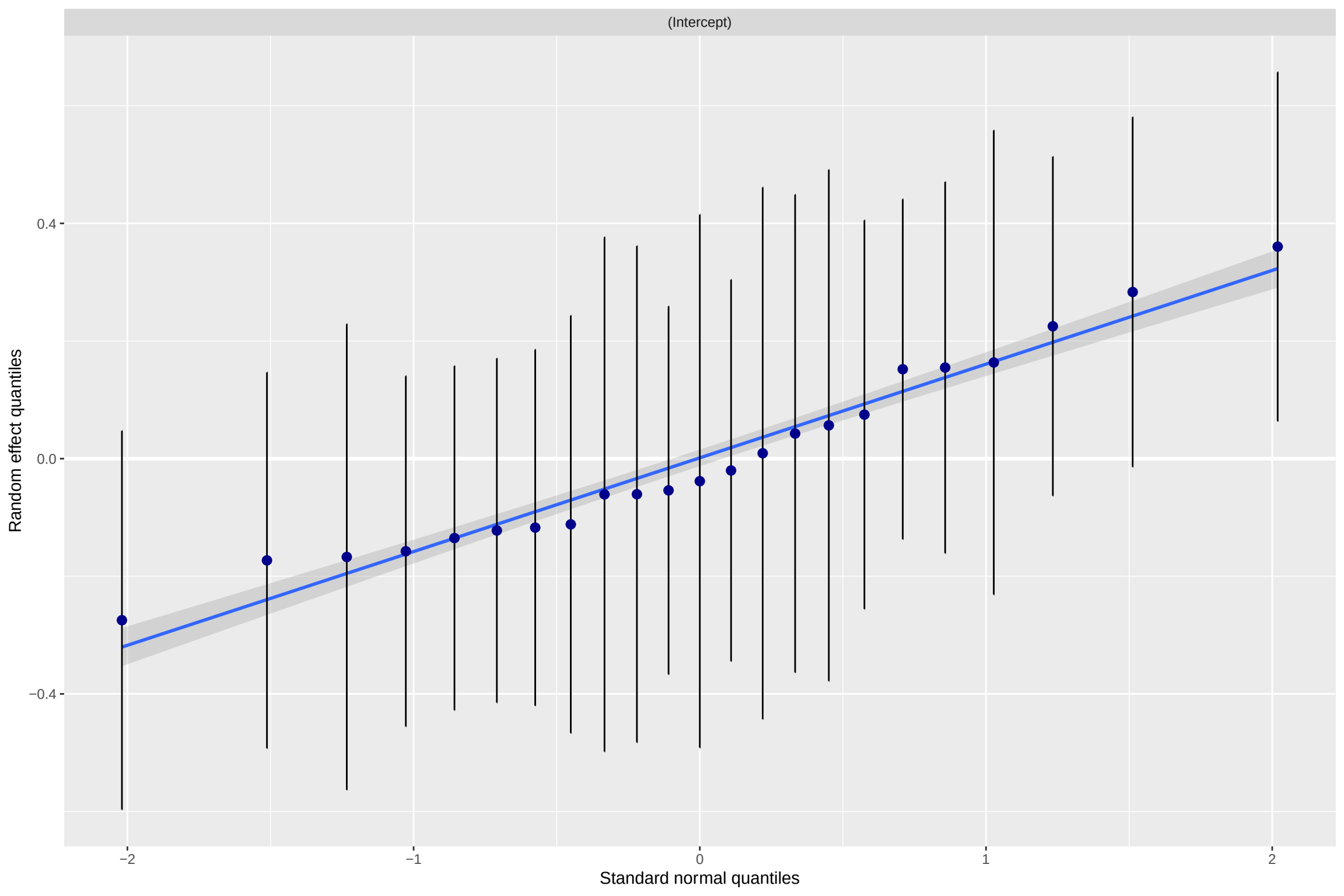

Predicting number of fish in trap haul
depth_m
location_exposureWindward
designZ
log_days_since_last_haul
−0.5
0.0
Coefficient estimate
Fixed coefficients in model
(highest to lowest AIC)
log_days_since_last_haul
design
location_exposure
depth_m

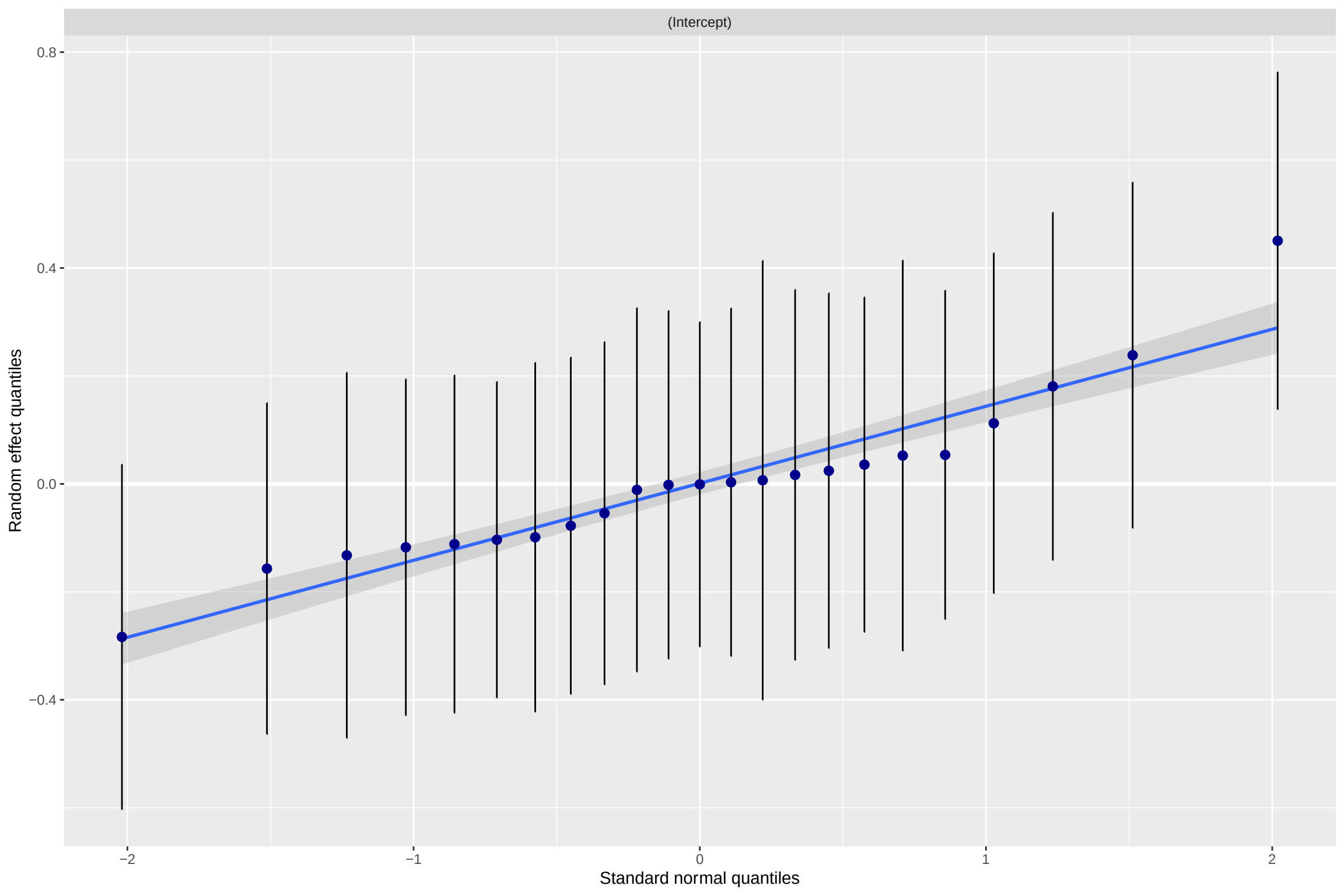

(Intercept)
Random effect quantiles
0.4
0.0
−0.4
−2
−1
0
1
2
Standard normal quantiles

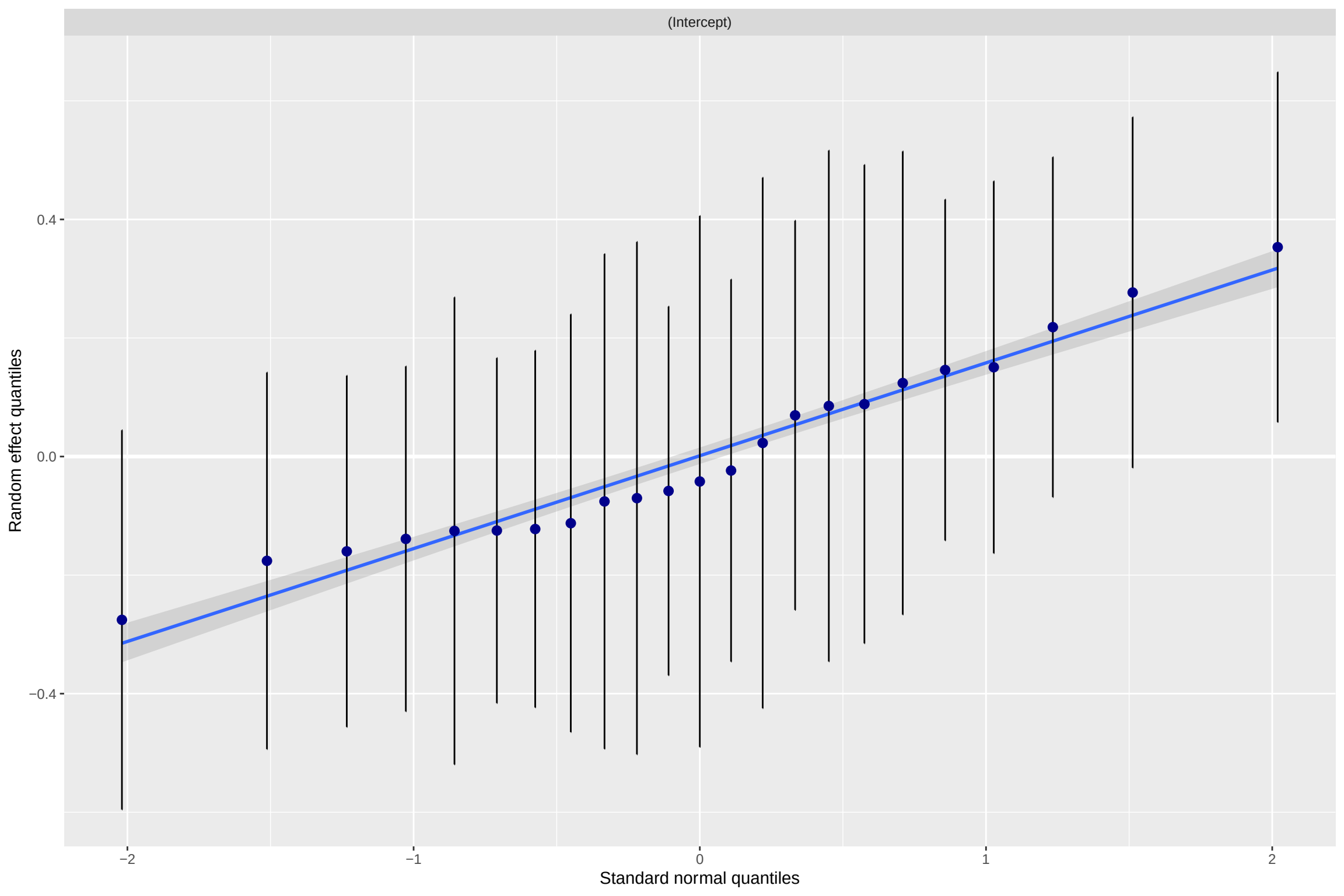

(Intercept)
0.8
0.4
0.0
−0.4
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles

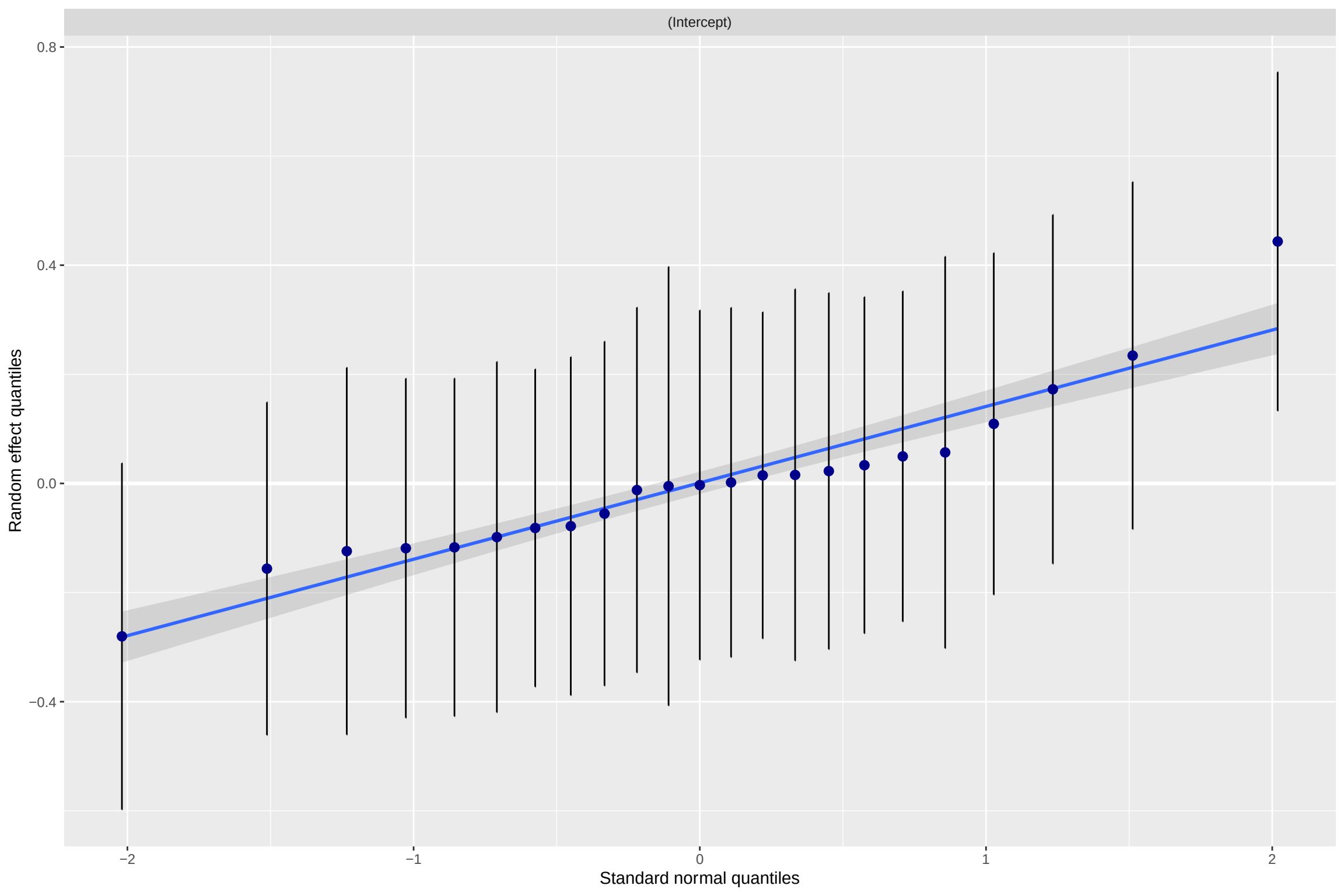

(Intercept)
0.6
0.3
0.0
−0.3
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles

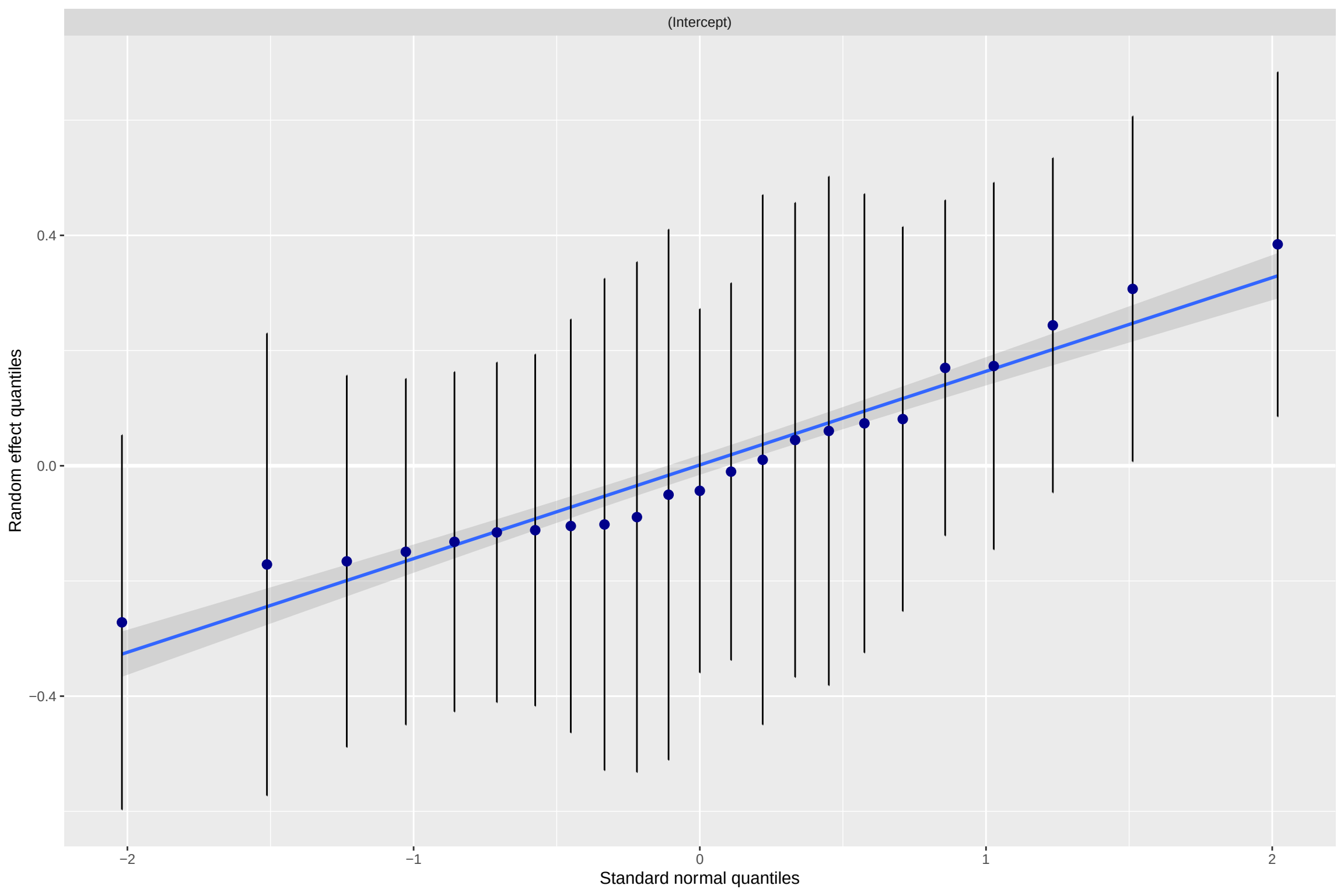

(Intercept)
0.8
0.4
0.0
−0.4
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles

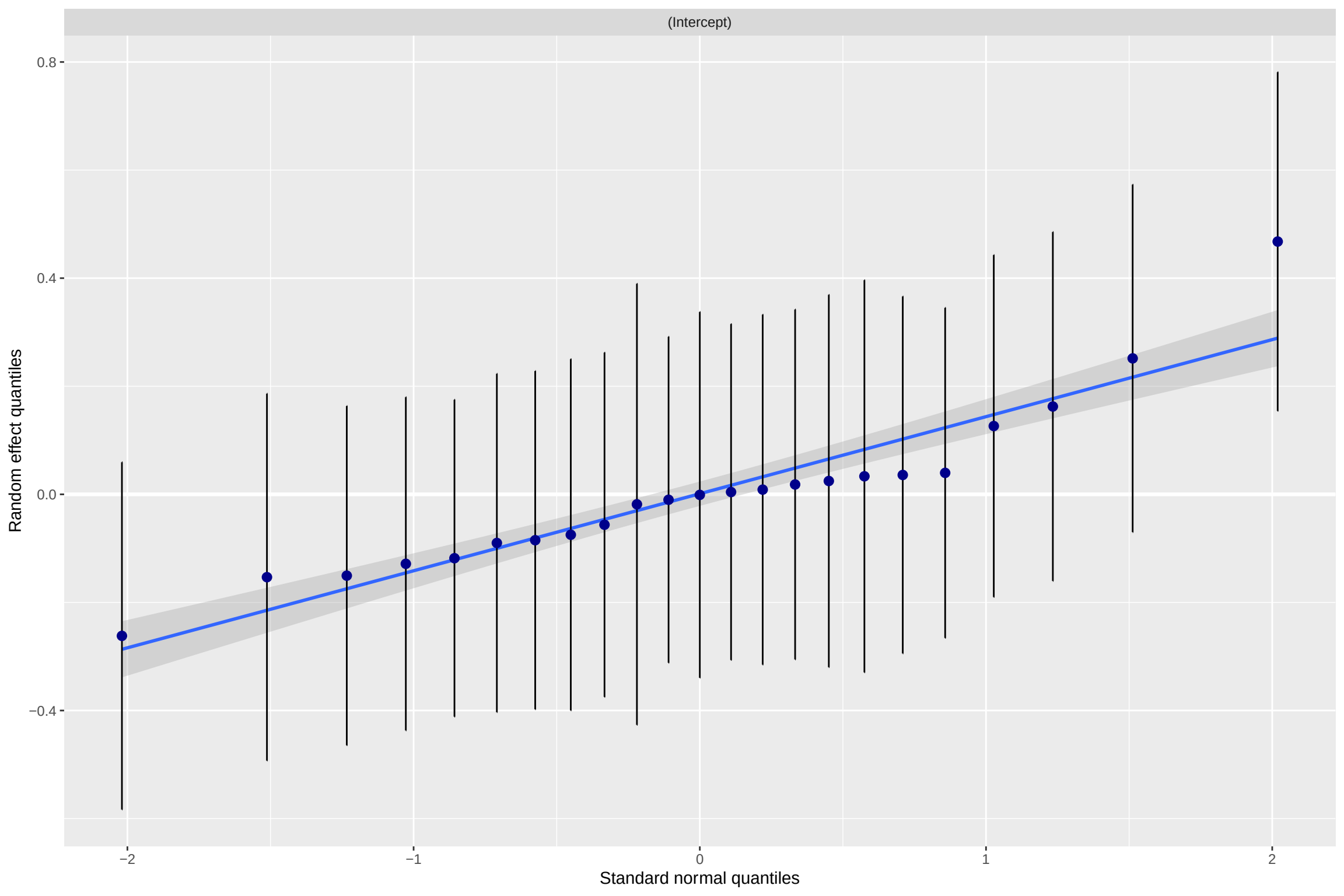

(Intercept)
Random effect quantiles
0.4
0.0
−0.4
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
0.8
0.4
0.0
−0.4
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
Random effect quantiles
0.4
0.0
−0.4
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
0.8
0.4
0.0
−0.4
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
Random effect quantiles
0.4
0.0
−0.4
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
0.8
0.4
0.0
−0.4
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles

Model summaries for all models with delta AIC < 2

```
$none
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: Negative Binomial(1.8498)  ( log )
Formula: no_fish ~ (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1743.2   1757.5   −867.6   1735.2      255

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.1835 −0.7597 −0.2595  0.6162  5.2071

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.05675  0.2382
 Date_YMD (Intercept) 0.05012  0.2239
Number of obs: 259, groups:  TrapID, 23; Date_YMD, 23

Fixed effects:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.27959    0.09075   25.12   <2e−16 ***
---
Signif. codes:  0 ...***... 0.001 ...**... 0.01 ...*... 0.05 ..... 0.1 ... ... 1

$depth_m
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: Negative Binomial(1.8498)  ( log )
Formula: no_fish ~ depth_m + (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1744.2   1762.0   −867.1   1734.2      254

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.1719 −0.7609 −0.2652  0.5783  4.9948

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.04946  0.2224
 Date_YMD (Intercept) 0.04670  0.2161
Number of obs: 259, groups:  TrapID, 23; Date_YMD, 23

Fixed effects:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.529861   0.222626  11.364   <2e−16 ***
depth_m     −0.006953   0.005877  −1.183    0.237
---
Signif. codes:  0 ...***... 0.001 ...**... 0.01 ...*... 0.05 ..... 0.1 ... ... 1

Correlation of Fixed Effects:
        (Intr)
depth_m −0.918
convergence code: 0
Model failed to converge with max|grad| = 0.0017661 (tol = 0.001, component 1)


$location_exposure
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: Negative Binomial(1.8498)  ( log )
Formula: no_fish ~ location_exposure + (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1744.4   1762.2   −867.2   1734.4      254

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.1828 −0.7651 −0.2528  0.6155  5.2196

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.05769  0.2402
 Date_YMD (Intercept) 0.04883  0.2210
Number of obs: 259, groups:  TrapID, 23; Date_YMD, 23

Fixed effects:
                          Estimate Std. Error z value Pr(>|z|)
(Intercept)                2.29815    0.09243  24.865   <2e−16 ***
location_exposureWindward −0.28276    0.31207  −0.906    0.365
---
Signif. codes:  0 ...***... 0.001 ...**... 0.01 ...*... 0.05 ..... 0.1 ... ... 1

Correlation of Fixed Effects:
            (Intr)
lctn_xpsrWn −0.222
```

```
$design
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: Negative Binomial(1.8498)  ( log )
Formula: no_fish ~ design + (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1744.6   1762.3   −867.3   1734.6      254

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.1823 −0.7678 −0.2561  0.5847  5.2305

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.05638  0.2374
 Date_YMD (Intercept) 0.04763  0.2182
Number of obs: 259, groups:  TrapID, 23; Date_YMD, 23

Fixed effects:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.12090    0.07563  28.045   <2e−16 ***
designZ      0.18495    0.11450   1.615    0.106
---
Signif. codes:  0 ...***... 0.001 ...**... 0.01 ...*... 0.05 ..... 0.1 ... ... 1

Correlation of Fixed Effects:
       (Intr)
designZ −0.576
convergence code: 0
unable to evaluate scaled gradient
Model failed to converge: degenerate  Hessian with 1 negative eigenvalues


$log_days_since_last_haul
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: Negative Binomial(1.8498)  ( log )
Formula: no_fish ~ log_days_since_last_haul + (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1744.9   1762.7   −867.5   1734.9      254

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.1798 −0.7646 −0.2619  0.5864  5.3008

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.05989  0.2447
 Date_YMD (Intercept) 0.04937  0.2222
Number of obs: 259, groups:  TrapID, 23; Date_YMD, 23

Fixed effects:
                          Estimate Std. Error z value Pr(>|z|)
(Intercept)                2.13762    0.28522   7.494 6.66e−14 ***
log_days_since_last_haul  0.06275    0.11935   0.526    0.599
---
Signif. codes:  0 ...***... 0.001 ...**... 0.01 ...*... 0.05 ..... 0.1 ... ... 1

Correlation of Fixed Effects:
            (Intr)
lg_dys_sn__ −0.947
```

Full model summary

```
eneralized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: Negative Binomial(1.8498)  ( log )
ormula: no_fish ~ design + log_days_since_last_haul + location_exposure +      Exp_or_Cont + depth_m + (1 | TrapID) + (1 | Date_YMD)
  Data: trap_haul_no_zero_depth
ontrol: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

    AIC      BIC   logLik deviance df.resid
 1750.6   1782.6   -866.3   1732.6      250

caled residuals:
   Min      1Q  Median      3Q     Max
1.1791 -0.7664 -0.2320  0.6180  5.1880

andom effects:
Groups    Name        Variance Std.Dev.
TrapID   (Intercept) 0.05212  0.2283
Date_YMD (Intercept) 0.04164  0.2040
umber of obs: 259, groups:  TrapID, 23; Date_YMD, 23

ixed effects:
                            Estimate Std. Error z value Pr(>|z|)
Intercept)                   2.233958   0.445222   5.018 5.23e-07 ***
esignZ                       0.243447   0.314318   0.775    0.439
og_days_since_last_haul   0.077762   0.116563   0.667    0.505
ocation_exposureWindward -0.022806   0.434415  -0.052    0.958
xp_or_ContExperimental   -0.057962   0.151688  -0.382    0.702
epth_m                   -0.008570   0.007343  -1.167    0.243
--
ignif. codes:  0 ...***... 0.001 ...**... 0.01 ...*... 0.05 ..... 0.1 ... ... 1

orrelation of Fixed Effects:
            (Intr) desgnZ lg____ lctn_W Ex__CE
esignZ      -0.532
g_dys_sn__ -0.643  0.149
ctn_xpsrWn -0.341  0.690  0.069
xp_r_CntEx -0.253  0.023 -0.014  0.115
epth_m      -0.328 -0.357 -0.069 -0.343  0.106
```