

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Example | Type of Regression | R function / R function for mixed models | More Information |
| Continuous | Age, Quality of Life | linear | [`lm()`](https://www.rdocumentation.org/packages/stats/versions/3.6.2/topics/lm) |  |
| [`lmer()`](https://www.rdocumentation.org/packages/lme4/versions/1.1-21/topics/lmer), [`glmmTMB()`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |  |
| Binary | Success yes/no | binary logistic | [`glm(family=binomial)`](https://www.rdocumentation.org/packages/stats/versions/3.6.2/topics/glm) | [UCLA](https://stats.idre.ucla.edu/r/dae/logit-regression/) |
| [`glmer()`](https://www.rdocumentation.org/packages/lme4/versions/1.1-21/topics/glmer), [`glmmTMB()`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |
| Trials (or proportions of \_counts\_) | 20 successes out of 30 trials | logistic | [`glm(cbind(trial,success), family=binomial)`](https://www.rdocumentation.org/packages/stats/versions/3.6.2/topics/glm) | [Hadley’s notes](http://had.co.nz/notes/modelling/logistic-regression.html) |
| [`glmer()`](https://www.rdocumentation.org/packages/lme4/versions/1.1-21/topics/glmer), [`glmmTMB()`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |
| Count data | Number of usage, counts of events | Poisson | [`glm(family=poisson)`](https://www.rdocumentation.org/packages/stats/versions/3.6.2/topics/glm) | [UCLA](https://stats.idre.ucla.edu/r/dae/poisson-regression/) |
| [`glmer()`](https://www.rdocumentation.org/packages/lme4/versions/1.1-21/topics/glmer), [`glmmTMB()`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |
| Count data, with excess zeros or overdispersion | Number of usage, counts of events (with higher variance than mean of response) | negative binomial | [`glm.nb()`](https://www.rdocumentation.org/packages/MASS/versions/7.3-47/topics/glm.nb) | [UCLA](https://stats.idre.ucla.edu/r/dae/negative-binomial-regression/) |
| [`glmer.nb()`](https://www.rdocumentation.org/packages/lme4/versions/1.1-21/topics/glmer.nb), [`glmmTMB(family=nbinom)`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |
| Count data with very many zeros (inflation) | see count data, but response is modelled as mixture of Bernoulli & Poisson distribution (two sources of zeros) | zero-inflated | [`zeroinfl()`](https://www.rdocumentation.org/packages/pscl/versions/1.5.2/topics/zeroinfl) | [UCLA](https://stats.idre.ucla.edu/r/dae/zip/) |
| [`glmmTMB(ziformula, family=poisson)`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |
| Count data, with very many zeros (inflation) and overdispersion | Number of usage, counts of events (with higher variance than mean of response) | zero-inflated negative binomial | [`zeroinfl(dist="negbin")`](https://www.rdocumentation.org/packages/pscl/versions/1.5.2/topics/zeroinfl) | [UCLA](https://stats.idre.ucla.edu/r/dae/zinb/) |
| [`glmmTMB(ziformula, family=nbinom)`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |
| Count data, zero-truncated | see count data, but only for positive counts (hurdle component models zero-counts) | hurdle (Poisson) | [`hurdle()`](https://www.rdocumentation.org/packages/pscl/versions/1.5.2/topics/hurdle) | [UCLA](https://stats.idre.ucla.edu/r/dae/zero-truncated-poisson/) |
| [`glmmTMB(family=truncated\_poisson)`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |
| Count data, zero-truncated and overdispersion | see “Count data, zero-truncated”, but with higher variance than mean of response | hurdle (neg. binomial) | [`vglm(family=posnegbinomial)`](https://www.rdocumentation.org/packages/VGAM/versions/1.1-2/topics/vglm) | [UCLA](https://stats.idre.ucla.edu/r/dae/zero-truncated-negative-binomial/) |
| [`glmmTMB(family=truncated\_nbinom)`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |
| Proportion / Ratio (without zero and one) | Percentages, proportion of \_continuous\_ data | Beta \_(see note below)\_ | [`betareg()`](https://www.rdocumentation.org/packages/betareg/versions/3.1-2/topics/betareg) | [ouR data generation]( https://www.rdatagen.net/post/binary-beta-beta-binomial/) |
| [`glmmTMB(family=beta)`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |  |
| Proportion / Ratio (including zero and one) | Percentages, proportions of \_continuous\_ data | Beta-Binomial | [`BBreg()`](https://www.rdocumentation.org/packages/HRQoL/versions/1.0/topics/BBreg), [`betabin()`](https://www.rdocumentation.org/packages/aod/versions/1.3.1/topics/betabin), [`vglm(family=betabinomial)`](https://www.rdocumentation.org/packages/VGAM/versions/1.1-2/topics/vglm) | [ouR data generation]( https://www.rdatagen.net/post/binary-beta-beta-binomial/) |
| Ordinal | Likert scale, worse/ok/better | ordinal, proportional odds | [`polr()`](https://www.rdocumentation.org/packages/MASS/versions/7.3-47/topics/polr), [`clm()`](https://www.rdocumentation.org/packages/ordinal/versions/2019.4-25/topics/clm) | [UCLA](https://stats.idre.ucla.edu/r/dae/ordinal-logistic-regression/) |
| [`clmm()`](https://www.rdocumentation.org/packages/ordinal/versions/2019.4-25/topics/clmm), [`mixor()`](https://www.rdocumentation.org/packages/mixor/versions/1.0.4/topics/mixor), [`MCMCglmm()`](https://www.rdocumentation.org/packages/MCMCglmm/versions/2.29/topics/MCMCglmm) |
| Cumulative, multinomial | No natural order of categories, like red/green/blue | cumulative link, multinomial | [`multinom()`](https://www.rdocumentation.org/packages/nnet/versions/7.3-12/topics/multinom), [`clm()`](https://www.rdocumentation.org/packages/ordinal/versions/2019.4-25/topics/clm), [`bracl()`](https://www.rdocumentation.org/packages/brglm2/versions/0.6.0/topics/bracl), [`brmultinom()`](https://www.rdocumentation.org/packages/brglm2/versions/0.6.0/topics/brmultinom) | [UCLA](https://stats.idre.ucla.edu/r/dae/multinomial-logistic-regression/) |
| [`clmm()`](https://www.rdocumentation.org/packages/ordinal/versions/2019.4-25/topics/clmm), [`mixor()`](https://www.rdocumentation.org/packages/mixor/versions/1.0.4/topics/mixor), [`MCMCglmm()`](https://www.rdocumentation.org/packages/MCMCglmm/versions/2.29/topics/MCMCglmm) |
| Continuous, right-skewed | Financial data, reaction times | Gamma | [`glm(family=Gamma)`](https://www.rdocumentation.org/packages/stats/versions/3.6.2/topics/glm) | [Sean Anderson]( https://seananderson.ca/2014/04/08/gamma-glms/) |
| [`glmer()`](https://www.rdocumentation.org/packages/lme4/versions/1.1-21/topics/glmer), [`glmmTMB()`](https://www.rdocumentation.org/packages/glmmTMB/versions/0.2.3/topics/glmmTMB) |  |
| Continuous, but truncated or outliers |  | truncated | [`censReg()`](https://www.rdocumentation.org/packages/censReg/versions/0.5-22/topics/censReg), [`tobit()`](https://www.rdocumentation.org/packages/AER/versions/1.2-8/topics/tobit), [`vglm(family=tobit)`](https://www.rdocumentation.org/packages/VGAM/versions/1.1-2/topics/vglm) | [UCLA-1](https://stats.idre.ucla.edu/r/dae/tobit-models/), [UCLA-2](https://stats.idre.ucla.edu/r/dae/truncated-regression/) |
| Proportion / Ratio with more than 2 categories | Biomass partitioning in plants (ratio of leaf, stem and root mass) | Dirichlet | [`DirichReg()`](https://www.rdocumentation.org/packages/DirichletReg/versions/0.6-3/topics/DirichReg) |  |