
**Multivariate generalized linear mixed
models for continuous bounded
outcomes: Analyzing the body fat
percentage data**

Supplementary Material

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Web Appendix A

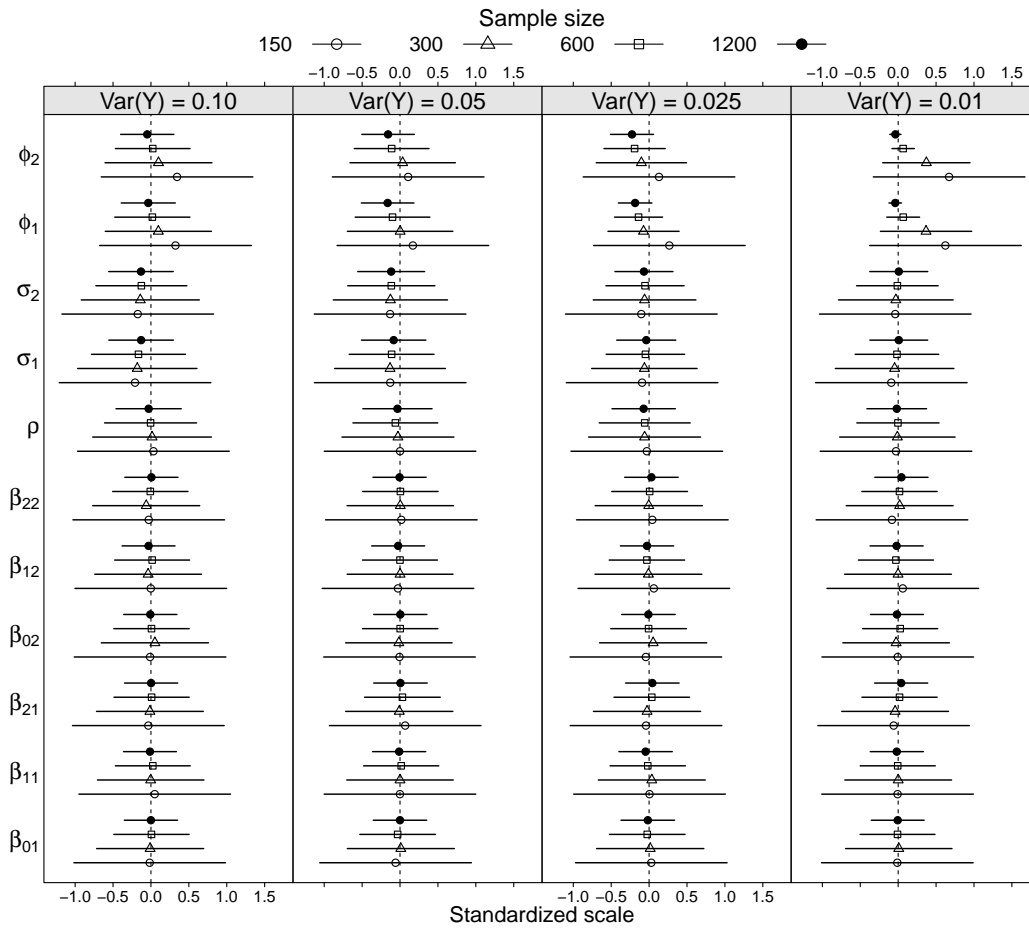


Figure 1: Average bias and confidence intervals on a standardized scale by sample size and variance levels - Beta distribution ($\rho = -0.5$).

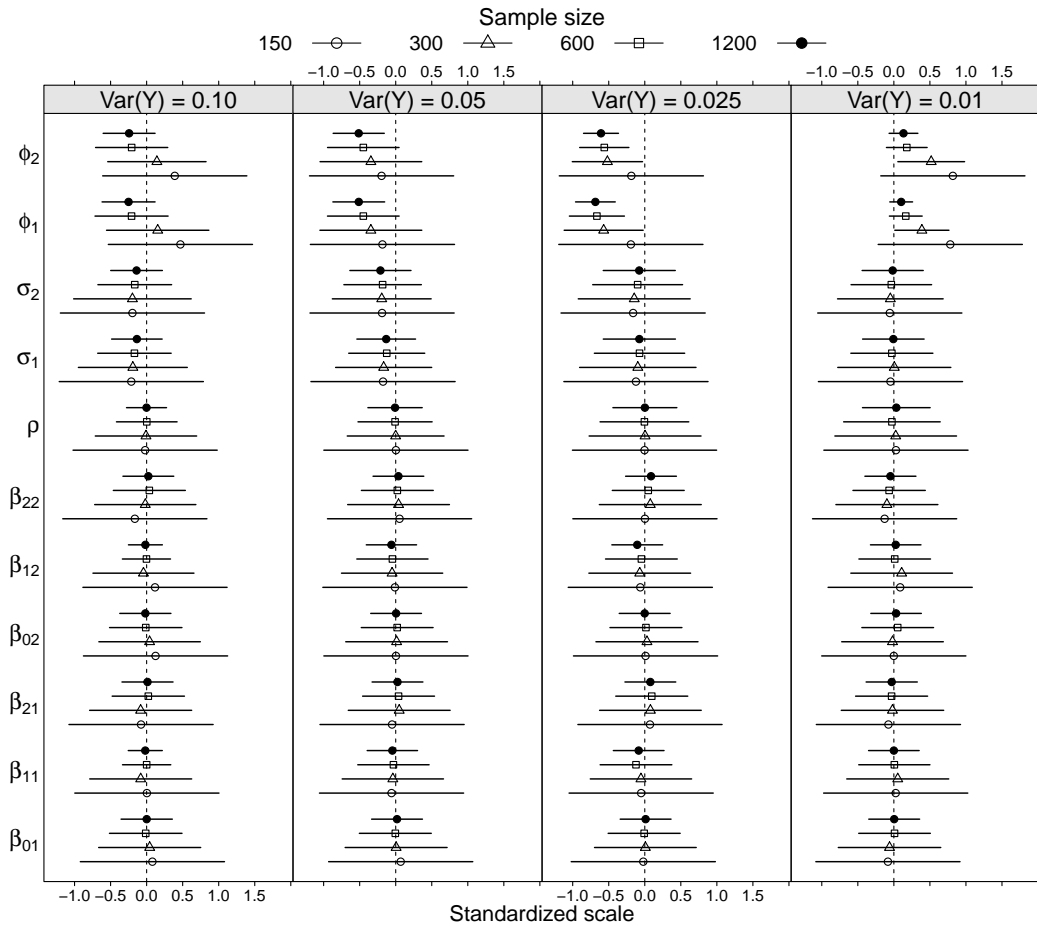


Figure 2: Average bias and confidence intervals on a standardized scale by sample size and variance levels - Beta distribution ($\rho = 0.0$).

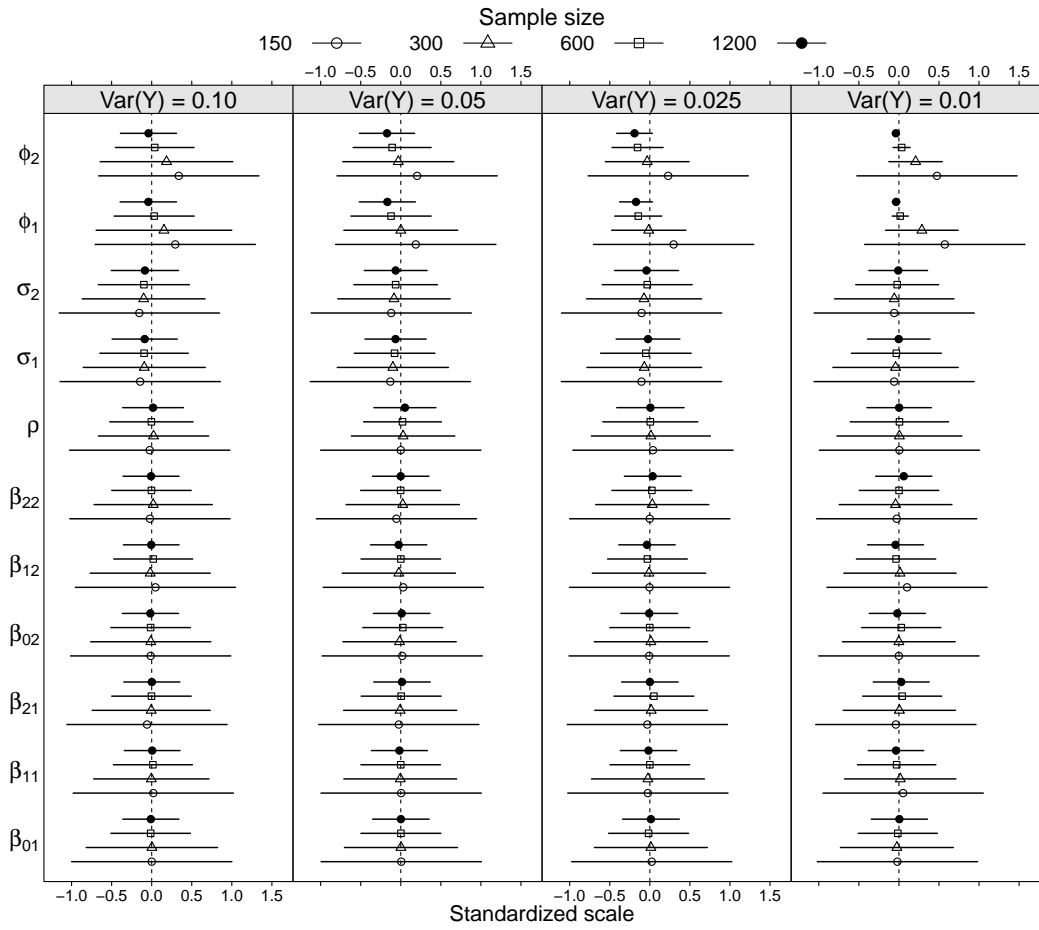


Figure 3: Average bias and confidence intervals on a standardized scale by sample size and variance levels - Beta distribution ($\rho = 0.5$).

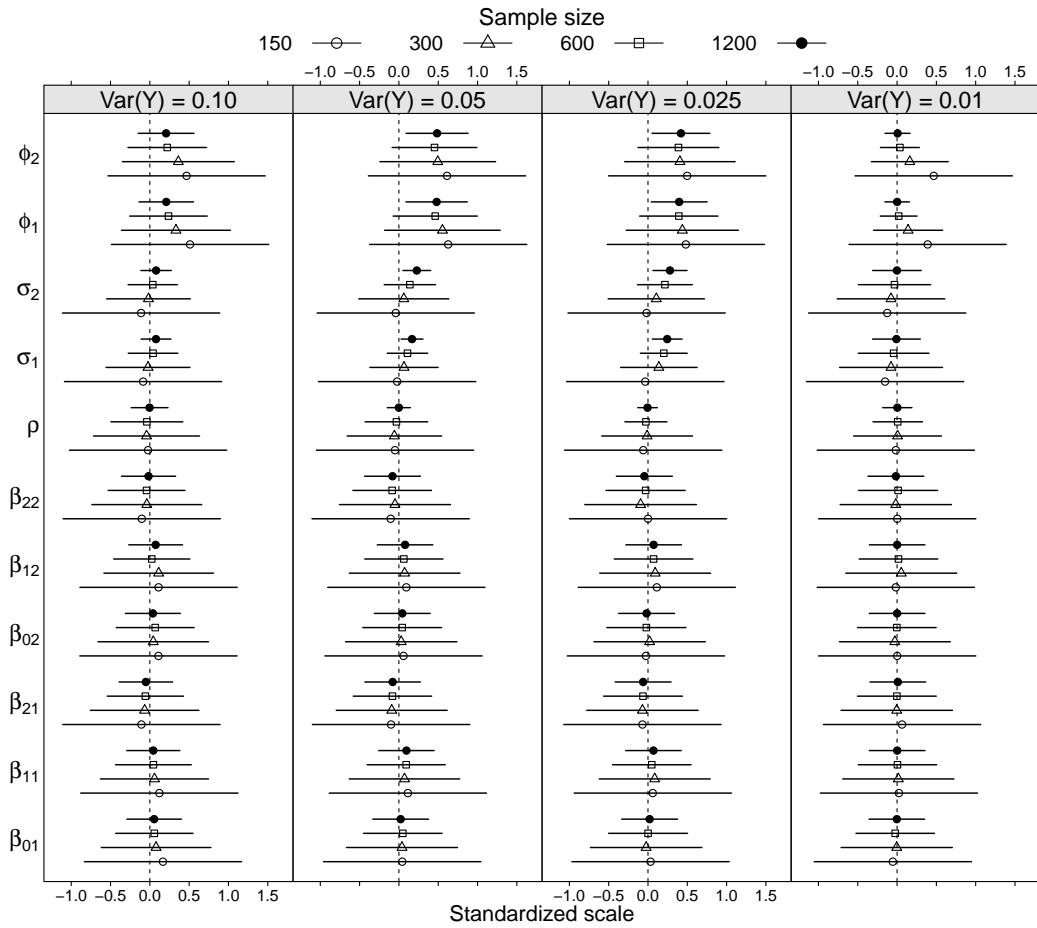


Figure 4: Average bias and confidence intervals on a standardized scale by sample size and variance levels - Unit gamma distribution ($\rho = -0.5$).

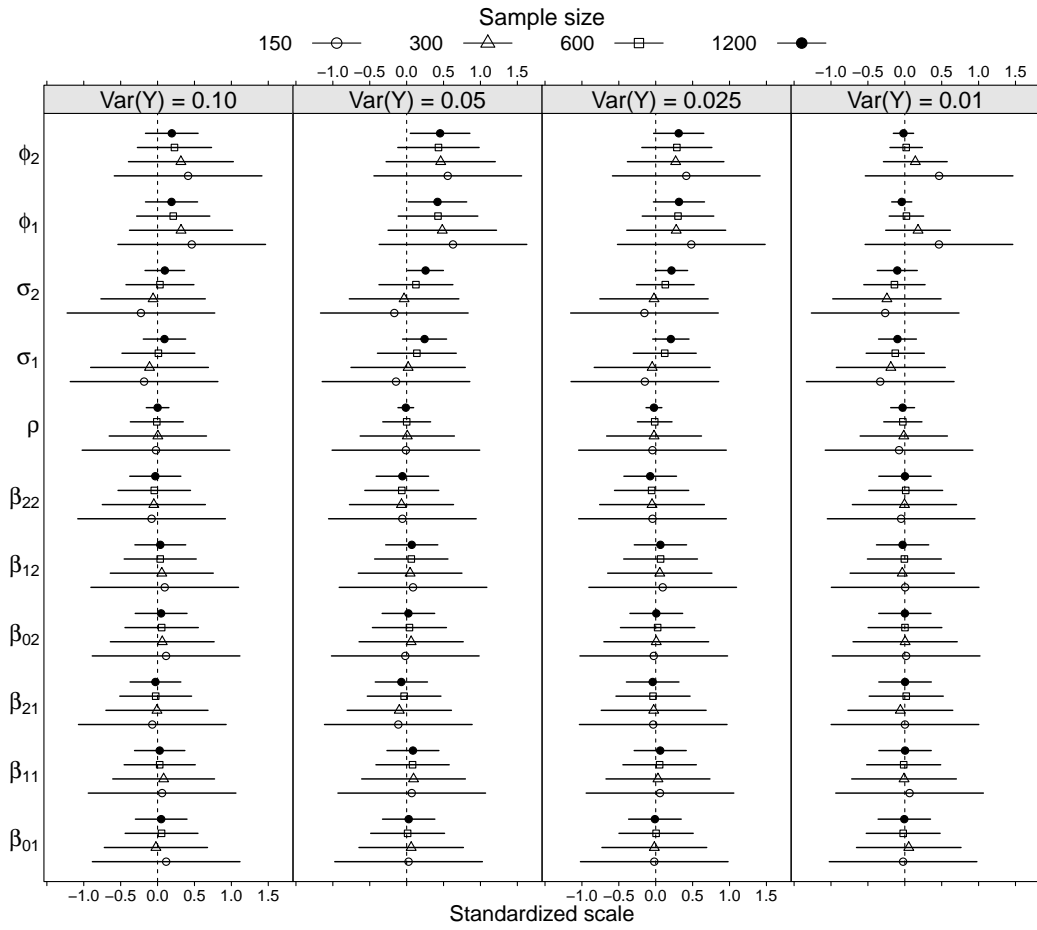


Figure 5: Average bias and confidence intervals on a standardized scale by sample size and variance levels - Unit gamma distribution ($\rho = 0.0$).

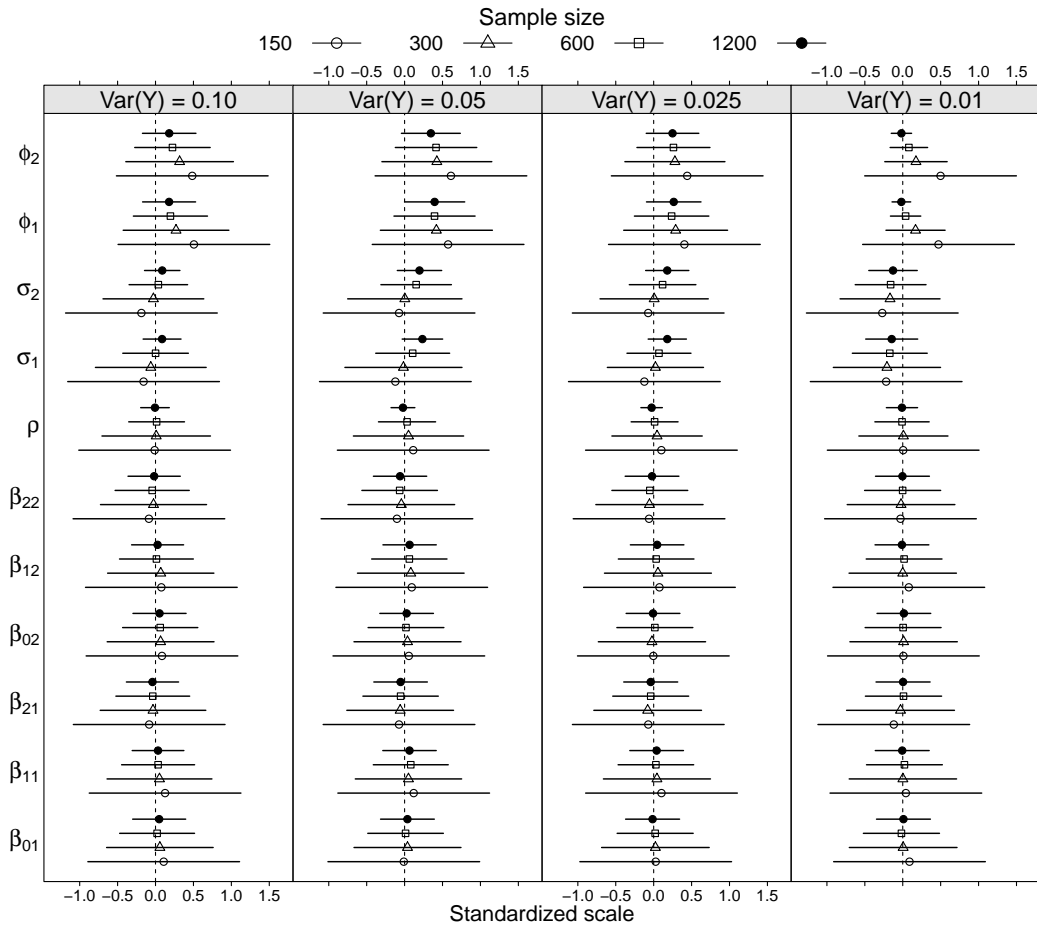


Figure 6: Average bias and confidence intervals on a standardized scale by sample size and variance levels - Unit gamma distribution ($\rho = 0.5$).

Web Appendix B

Table 1: Maximized log-likelihood values ($\log\text{Lik}$) for univariate regression models fitted by distributions and response variables.

Distributions	Response variables				
	Arms	Legs	Trunk	Android	Gynoid
Beta	460.74	426.41	445.46	382.79	442.80
Simplex	424.89	409.89	411.83	350.82	429.87
Unit gamma	460.51	423.81	448.75	387.91	442.78

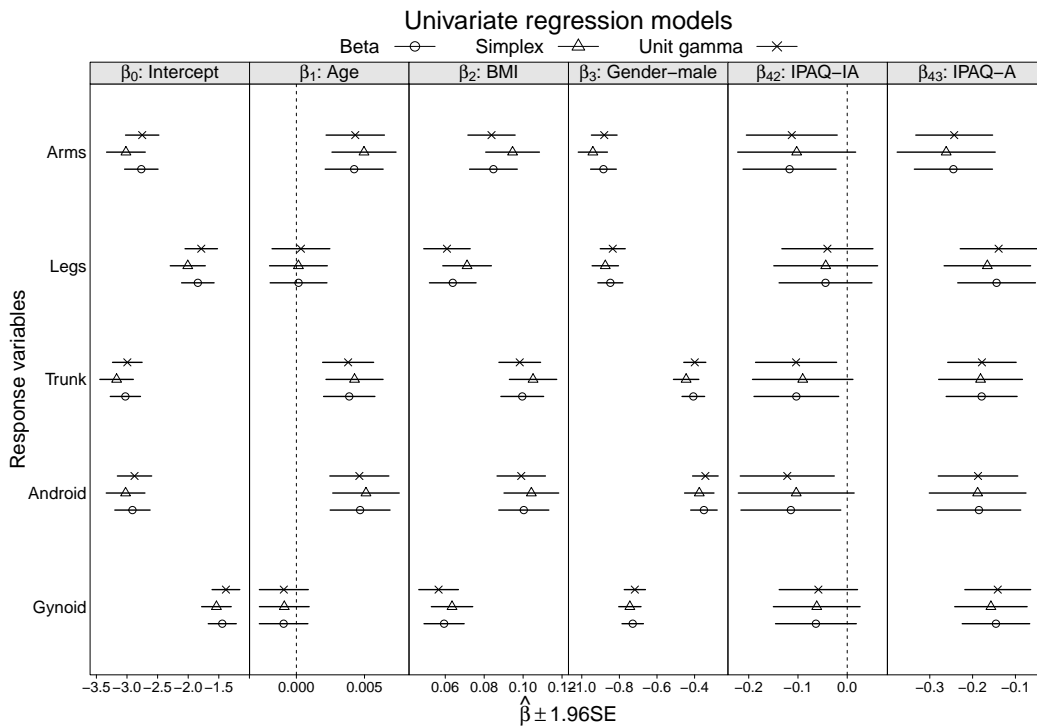


Figure 7: Parameter estimates and 95% confidence intervals for the univariate regression models by response variables and distributions.

Web Appendix C

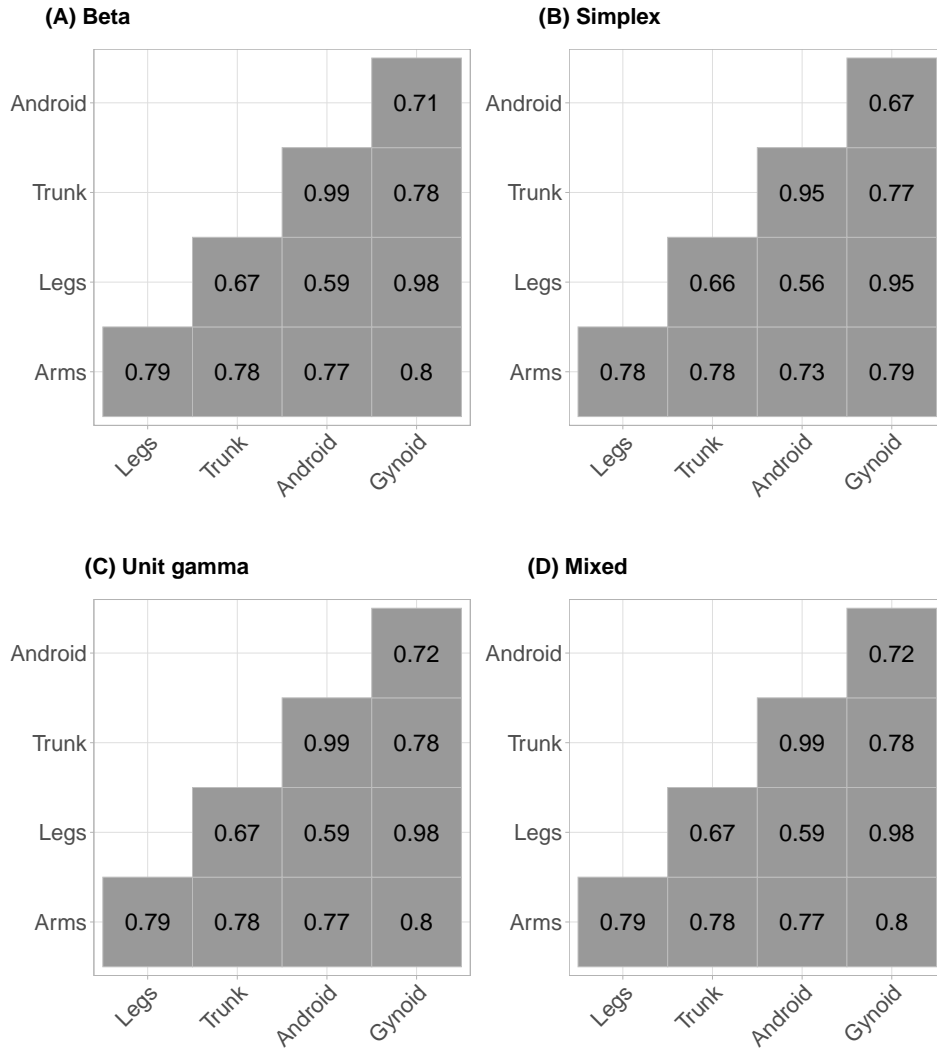


Figure 8: Correlation matrix between the response variables for the MGLMM by distributions.

Web Appendix D

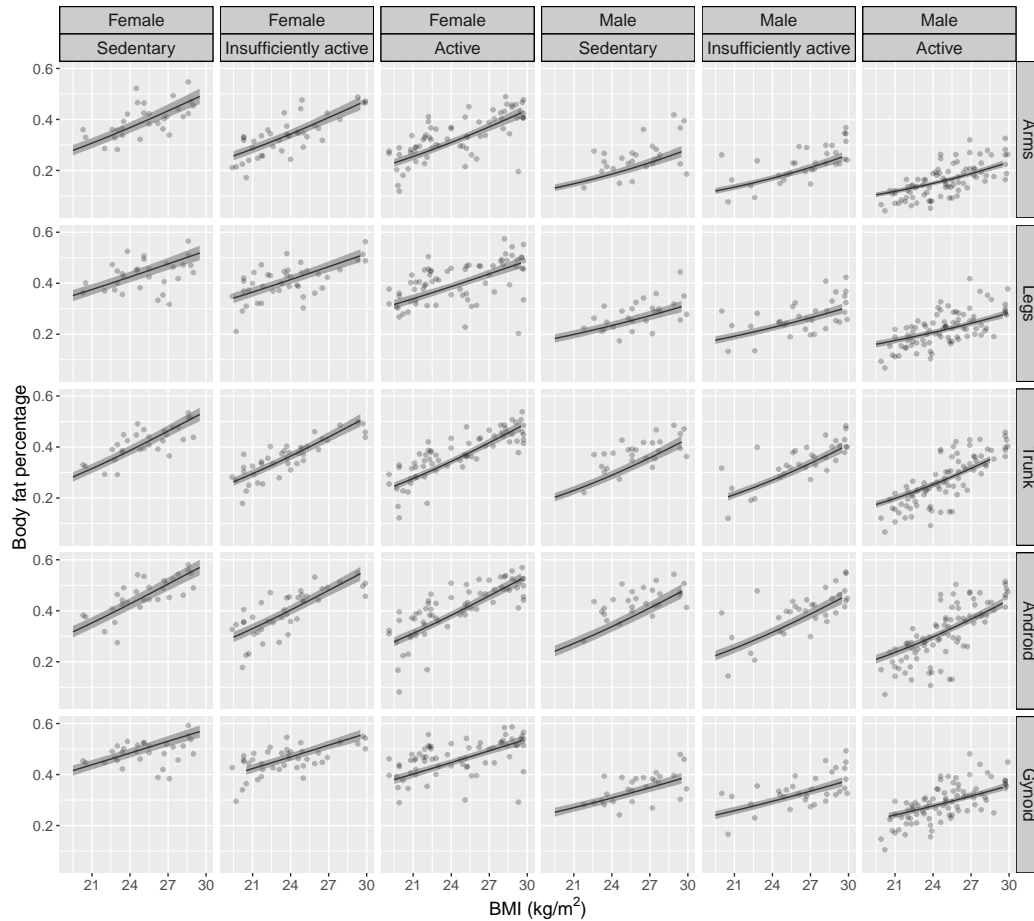


Figure 9: Curves of fitted values with 95% confidence intervals by gender, IPAQ and BMI for the MGLMM unit gamma by response variables.