Random Sampling

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Case Studies II

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Random Sampling: R Code

```
library(ordinal)
library(scales)

design <- data.frame(matrix(nrow = 200, ncol = 7))
colnames(design) <- c("sigma_mem_y", "f_mem", "sigma_mem",
            "E_mem", "nu_mem", "sigma_edg", "sigma_sup")

set.seed(18112025)

design[,1] <- rlnorm(200, meanlog = mean1, sdlog = sd1)
design[,2] <- rgumbel(200, location = loc2, scale = scale2)
design[,3] <- rlnorm(200, meanlog = mean3, sdlog = sd3)
design[,4] <- rlnorm(200, meanlog = mean4, sdlog = sd4)
design[,5] <- runif(200, min = min5, max = max5)
design[,6] <- rlnorm(200, meanlog = mean6, sdlog = sd6)
design[,7] <- rlnorm(200, meanlog = mean7, sdlog = sd7)

head(design)
```

Random Sampling: Experimental Design

sigma_mem_y	f_mem	sigma_mem	E_mem	nu_mem	sigma_edg	sigma_sup
11953.69	0.36	3570.29	864037.54	0.38	394452.13	322331.74
11818.22	0.31	3581.52	548062.54	0.43	435005.97	646354.63
10779.71	0.36	3900.54	783000.32	0.27	277133.57	278497.80
10790.90	0.37	4980.23	543638.60	0.45	377775.43	512816.17
9143.05	0.48	4141.27	779096.27	0.30	278369.29	398611.23
8445.48	0.32	4775.31	630852.04	0.39	276368.59	406152.01
⋮	⋮	⋮	⋮	⋮	⋮	⋮

Random Sampling: Pros & Cons

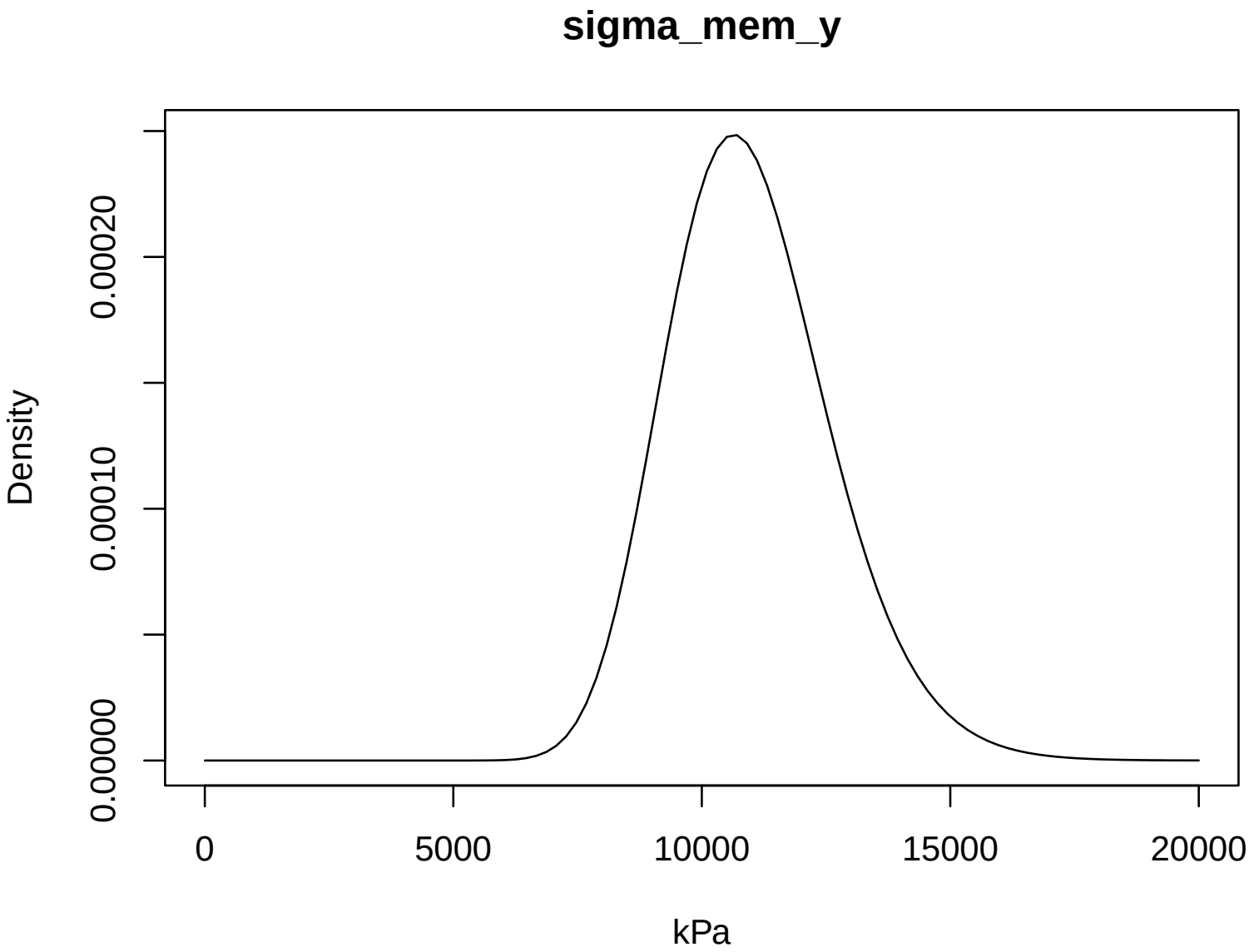
Pros:

- easy
- values that are more likely are represented more often $\rightarrow$ better model for those values

Cons:

- little control over design
- might miss extreme values (low probability)
- some combinations are more likely than others

Random Sampling: Exemplary Sample



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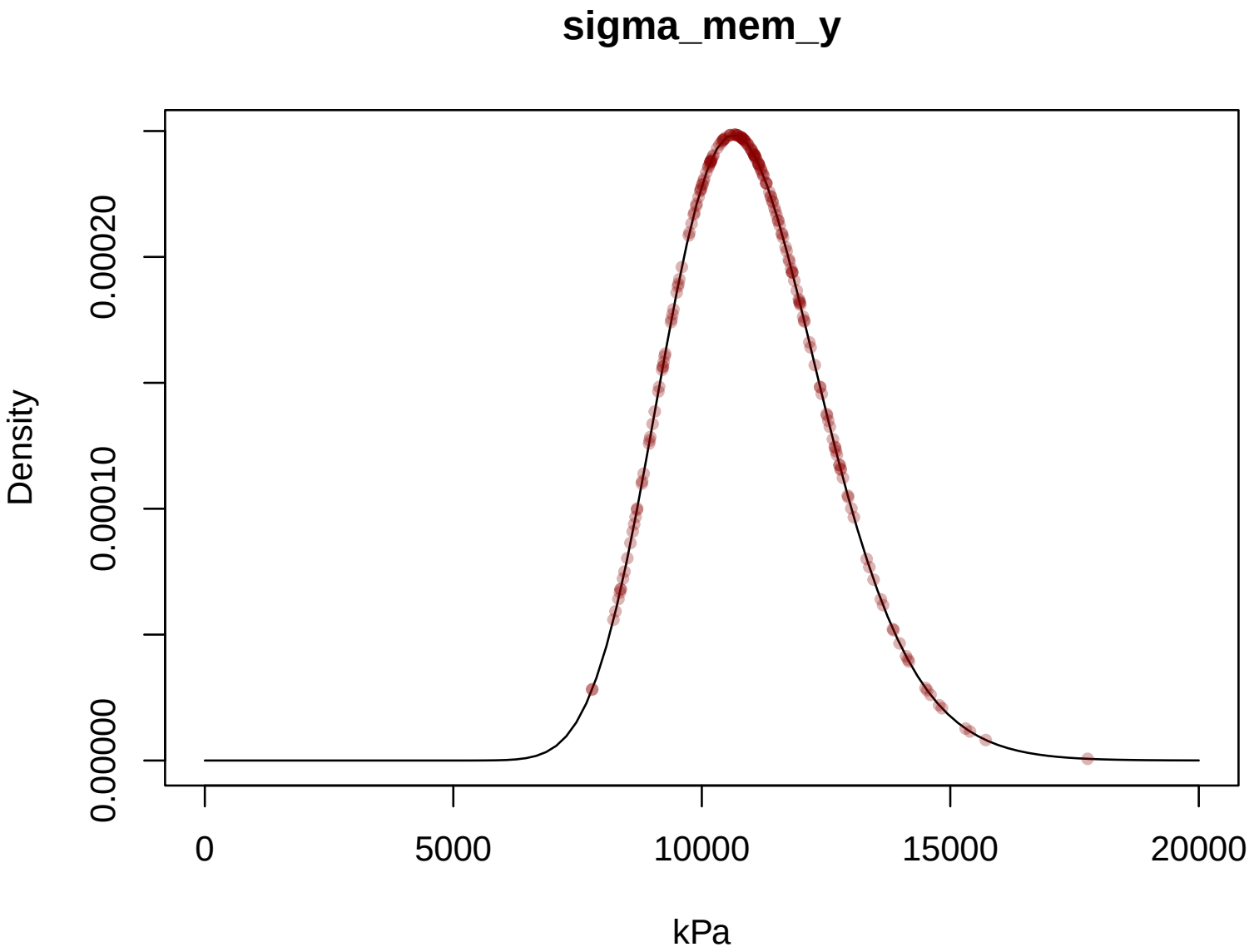

Software

- Christensen, Rune H. B. (2023). *ordinal—Regression Models for Ordinal Data*. R package version 2023.12-4.1.
- R Core Team (2025). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing. Vienna, Austria.
- Wickham, Hadley, Pedersen, Thomas Lin and Seidel, Dana (2025). *scales: Scale Functions for Visualization*. R package version 1.4.0. DOI: 10.32614/CRAN.package.scales.