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| **Biostokastikum** | 2014-06-03 |

Exercise 4 – Mixed logistic regression

Larvae of the European pine sawfly (*Neodiprion sertifer*) are subjected to predation from ants that climb up pine trees and hunt the larvae. An experiment was designed to estimate the risk of predation. A total of 81 pine trees were selected in two blocks each in three different geographical areas (Asa, Uppsala and Vindeln). On each tree, two similar branches were selected where a number of sawfly larvaea were placed. One of the branches was covered with some semi-permeable fabric that let sunlight, air and humidity pass through but protected the larvae from ants. The other branch was kept uncovered. After 1, 2, 3, 4 and 5 weeks, the number of larvae that had died or disappeared on each branch was counted.

## Exercise

Build a mixed generalized linear model for the risk of death or disappearance of sawfly with respect to geographical area, time and treatment. Consider possible interactions in the model and include those that improve the model significantly. Include random effects with respect to the hierarchical design and repeated measurements of the experiment Summarize your findings and draw conclusions about the risk of predation.