Vaso Constriction - Logistic Regression

February 8, 2012

First the dataset vaso is loaded.

```
> library(catdata)
> data(vaso)
> attach(vaso)
```

For the fitting of a logit model, the response is 0-1 coded. (data set contains 1 2). Moreover, the covariates vol and rate are log-transformed.

```
> y <- vaso$vaso
> y[vaso$vaso==2] <- 0
```

Fit of a logit-model with log-transformed covariates.

```
> vaso1 <- glm(y ~ vol + rate, family=binomial)
> summary(vaso1)

Call:
glm(formula = y ~ vol + rate, family = binomial)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-1.4527  -0.6110   0.1001   0.6181   2.2775

Coefficients:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)   -2.875      1.321  -2.177  0.02946 *
vol            5.179      1.865   2.778  0.00547 **
rate           4.562      1.838   2.482  0.01306 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 54.040  on 38  degrees of freedom
Residual deviance: 29.227  on 36  degrees of freedom
AIC: 35.227

Number of Fisher Scoring iterations: 6
```

Next, a logit-model with original covariates is fitted.

```
> vaso2 <- glm(y ~ I(exp(vol)) + I(exp(rate)), family=binomial)
> summary(vaso2)

Call:
glm(formula = y ~ I(exp(vol)) + I(exp(rate)), family = binomial)

Deviance Residuals:
     Min        1Q    Median        3Q       Max
-1.50657  -0.73464   0.03997   0.48854   2.32935

Coefficients:
             Estimate Std. Error z value Pr(>|z|)
(Intercept)   -9.5296     3.2332  -2.947  0.00320 **
I(exp(vol))    3.8822     1.4286   2.717  0.00658 **
I(exp(rate))   2.6491     0.9142   2.898  0.00376 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 54.040  on 38  degrees of freedom
Residual deviance: 29.772  on 36  degrees of freedom
AIC: 35.772

Number of Fisher Scoring iterations: 6
```