qPoisson

Parametrisation

The Poisson distribution is

$$\text{Prob}(y) = \frac{\lambda^y}{y!}\exp(-\lambda)$$

for responses $y = 0, 1, 2, \ldots$, where

λ**:** the expected value.

Link-function

The mean and variance of y are given as

$$\mu = \lambda \qquad \text{and} \qquad \sigma^2 = \lambda$$

and the mean is linked to the linear predictor by

$$\lambda(\eta) = Eq_\alpha$$

where $E > 0$ is a known constant (or $\log(E)$ is an offset), and q_α is the α quantile of the continous Poisson distribution.

Hyperparameters

None.

Specification

- family = `qpoisson`
- Required arguments: y, E and α (given as `control.family = list(quantile =` α`)`.

Hyperparameter spesification and default values

hyper

survival FALSE

discrete TRUE

link default log

status experimental

pdf qpoisson

Example

In the following example we estimate the parameters in a simulated example with Poisson responses.

```
n = 300
intercept = 2
x = rnorm(n, sd = 0.2)
beta = 1
eta = intercept + beta * x
```

```
alpha = 0.9
y = numeric(n)
E = runif(n, min=1, max=10)
for(i in 1:n) {
    lambda = E[i] * INLA:::inla.qcontpois(exp(eta[i]), alpha = alpha)
    y[i] = rpois(1, lambda)
}

r = inla(y ~ 1 + x,
         data = data.frame(y, x, E),
         family = "qpoisson",
         control.family = list(quantile = alpha),
         E =E)
summary(r)
```

Notes