

## A special case of the Gamma-distribution

### Parametrisation

We consider this distribution

$$\pi(y) = \frac{1}{\Gamma(a)} y^{a-1} \exp(-y), \quad a > 0, \quad y > 0,$$

where  $E(y) = \mu = a$ .

### Link-function

The linear predictor  $\eta$  is linked to the mean  $\mu$  using a default log-link

$$\mu = \exp(\eta)$$

### Hyperparameter

None.

### Specification

- family = `gammajw` for regression models and family = `gammajw.surv` for survival models.
- Required arguments: for `gammajw.surv`,  $y$  (to be given in a format by using `inla.surv()`), and for `gammajw`,  $y$ .

### Hyperparameter spesification and default values

#### **gammajw:**

**doc** A special case of the Gamma likelihood

**hyper**

**survival** FALSE

**discrete** FALSE

**link** default log neglog

**pdf** gammajw

#### **gammajwsurv:**

**doc** A special case of the Gamma likelihood (survival)

**hyper**

#### **theta1**

**hyperid** 58200

**name** beta1

**short.name** beta1

**initial** -7

**fixed** FALSE

**prior** normal

```

    param -4 100
    to.theta function(x) x
    from.theta function(x) x
theta2
    hyperid 58201
    name beta2
    short.name beta2
    initial 0
    fixed FALSE
    prior normal
    param 0 100
    to.theta function(x) x
    from.theta function(x) x
theta3
    hyperid 58202
    name beta3
    short.name beta3
    initial 0
    fixed FALSE
    prior normal
    param 0 100
    to.theta function(x) x
    from.theta function(x) x
theta4
    hyperid 58203
    name beta4
    short.name beta4
    initial 0
    fixed FALSE
    prior normal
    param 0 100
    to.theta function(x) x
    from.theta function(x) x
theta5
    hyperid 58204
    name beta5
    short.name beta5
    initial 0
    fixed FALSE
    prior normal
    param 0 100
    to.theta function(x) x
    from.theta function(x) x
theta6

```

```

hyperid 58205
name beta6
short.name beta6
initial 0
fixed FALSE
prior normal
param 0 100
to.theta function(x) x
from.theta function(x) x
theta7
hyperid 58206
name beta7
short.name beta7
initial 0
fixed FALSE
prior normal
param 0 100
to.theta function(x) x
from.theta function(x) x
theta8
hyperid 58207
name beta8
short.name beta8
initial 0
fixed FALSE
prior normal
param 0 100
to.theta function(x) x
from.theta function(x) x
theta9
hyperid 58208
name beta9
short.name beta9
initial 0
fixed FALSE
prior normal
param 0 100
to.theta function(x) x
from.theta function(x) x
theta10
hyperid 58209
name beta10
short.name beta10
initial 0

```

```

    fixed FALSE
    prior normal
    param 0 100
    to.theta function(x) x
    from.theta function(x) x

survival TRUE

discrete FALSE

link default log

pdf gammajw

```

## Example

In the following example we estimate the parameters in a simulated example.

```

n <- 300
x <- rnorm(n, sd = 0.3)
eta <- 1 + x
mu <- exp(eta)
y <- rgamma(n, shape = mu, scale = 1)
r <- inla(y ~ 1 + x,
          data = data.frame(y, x),
          family = "gammajw",
          control.compute = list(cpo = TRUE),
          control.fixed = list(prec.intercept = 0.01),
          verbose = TRUE)
summary(r)

yy <- inla.surv(y, event = 1)
rr <- inla(yy ~ 1 + x,
          data = list(yy = yy, x = x),
          family = "gammajwsurv",
          control.compute = list(cpo = TRUE),
          control.fixed = list(prec.intercept = 0.01),
          verbose = TRUE)
summary(rr)

print(r$summary.fixed - rr$summary.fixed)

```

## Notes

None.