1 Parametric-Cure Model (PCM) forms

These are two spilt-population models. Survival, $S(t)$ where $g(t)$ is time , t, itself or $\tilde{t}$. Please note that $\tilde{t}$ is the scaled and shaped time: $\tilde{t} = (\lambda t)^{\gamma}$ where the scale and shape are, respectively, $\lambda = exp(x_{\lambda}\beta_{\lambda})$ and $\gamma = exp(x_{\gamma}\beta_{\gamma})$.

1.1 *mixture, model or class (00)* *the Mata function*: PCM*00*kkll()

$$S(t) = \pi + (1 - \pi)(1 - F(g(t))) \tag{1}$$

1.2 *non-mixture, model (01)* *the Mata function*: PCM*01*kkll()

$$S(t) = \pi^{F(g(t))} \tag{2}$$

1.3 *fail density:* *the Mata function*: PCMmm*kk*ll()

dist() or kernel distribution *(kk):*

weibull (01)

$$F(\tilde{t}) = 1 - exp\left(-\tilde{t}\right) \tag{3}$$

lognormal (02)

$$F(\tilde{t}) = \int_{-\infty}^{ln\left(\tilde{t}\right)} \frac{1}{\sqrt{2\pi}} e^{\left(-x^2/2\right)} dx \tag{4}$$

logns1 lognormal,shape=1 (08)

$$F(\tilde{t}) = \int_{-\infty}^{ln(\lambda t)} \frac{1}{\sqrt{2\pi}} e^{\left(-x^2/2\right)} dx \tag{5}$$

lognv lognormal (06)

$$F(t) = \int_{-\infty}^{ln(t)} \frac{1}{(\gamma)\sqrt{2\pi}} e^{\left(-(x-(x_{\lambda}\beta_{\lambda}))^2/2\gamma^2\right)} dx \tag{6}$$

lognv1 lognormal,var=1 (07)

$$F(t) = \int_{-\infty}^{ln(t)} \frac{1}{(1)\sqrt{2\pi}} e^{\left(-(x-(x_{\lambda}\beta_{\lambda}))^2/2\right)} dx \tag{7}$$

logistic (03)

$$F(\tilde{t}) = \frac{\tilde{t}}{1 + \tilde{t}} \tag{8}$$

gamma (04)

$$F(t) = \int_{0}^{t} \frac{x^{(\gamma-1)}}{\lambda^{\gamma}\Gamma(\gamma)} exp\left(-\frac{x}{\lambda}\right) dx \tag{9}$$

exponential (05)

$$F(t) = 1 - exp\left(-\frac{t}{\lambda}\right) \tag{10}$$

1.4 *cure-fraction link function:* *the Mata function*: PCMmmkk*ll()*

link() or cure fraction link *(ll):*

logistic (01)

$$\pi = \frac{exp(x_{\pi}\beta_{\pi})}{1 + exp(x_{\pi}\beta_{\pi})} \tag{11}$$

log-minus-log (02)

$$\pi = exp(-exp(x_{\pi}\beta_{\pi})) \tag{12}$$

linear (03)

$$\pi = x_{\pi}\beta_{\pi} \tag{13}$$