Untitled

Jingchen Chai, Yi Huang, Ruihan Zhang

2023-02-26

R Markdown

Table 1: Characteristic of Exponential, Weibull and Gompertz distributions

	Distribution		
	Exponential	Weibull	Gompertz
Scale Parameter	$\lambda > 0$	$\lambda > 0$	$\lambda > 0$
Shape Parameter		$\gamma > 0$	$\alpha \in (-\infty, \infty)$
Baseline Hazard function	$h_0(t) = \lambda$	$h_0(t) = \lambda\gamma t^{\gamma-1}$	$h_0(t) = \lambda \exp(\alpha t)$
Cumulative Baseline Hazard Function	$H_0(t) = \lambda t$	$H_0(t) = \lambda t^{\gamma}$	$H_0(t) = \frac{\lambda}{\alpha}(e^{\alpha t} - 1)$
Inverse Cumulative Hazard Function	$H^{-1}(t) = \lambda^{-1} t$	$H^{-1}(t) = (\lambda^{-1} t)^{\frac{1}{\gamma}}$	$H^{-1}(T) = \frac{1}{\alpha} \log{(1 + \frac{\alpha}{\lambda} t)}$
Survival Time T	$T = -\frac{log(U)}{\lambda e^{X\beta}}$	$T = (-\frac{log(U)}{\lambda e^{X\beta}})^{\frac{1}{\gamma}}$	$T = \frac{1}{\alpha} log[1 - \frac{\alpha \log{(U)}}{\lambda e^{X\beta}}]$

Cumulative Distribution Function & $F(t) = 1 - e^{t\lambda e^{X\beta}}$ & $F(t) = 1 - e^{-\lambda t^{\gamma} e^{X\beta}}$ & $F(t) = 1 - e^{-\frac{\lambda}{\alpha}(e^{\alpha} - 1) e^{X\beta}}$