

Survival Function

The **survival function** is a function that gives the probability that a patient, device, or other object of interest will survive beyond any specified time.

Let T be a continuous random variable with cumulative distribution function $F(t)$ on the interval $[0, \infty)$. Its *survival function* or *reliability function* is:

$$S(t) = P(\{T > t\}) = \int_t^{\infty} f(u) du = 1 - F(t).$$

Hazard Function

More specifically, the hazard function models **which periods have the highest or lowest chances of an event**. The function is defined as the instantaneous risk that the event of interest happens, within a very narrow time frame.

The hazard function formula is:

$$h_Y(y) = \frac{f_Y(y)}{S_Y(y)}$$

