Formula 1:

$$S(t) = P(t > T) = 1 - F(t) \tag{1}$$

where:

T – duration time,

$F(T)$ – cumulative distribution function of random variable T.

Formula 2:

$$\hat{S}(t_i) = \prod_{j=1}^{i} \left(1 - \frac{d_j}{n_j}\right) \text{ dla } i = 1, 2, \ldots, k, \tag{2}$$

where:

t_i – the point in time when at least one event occurred, $t_1 < t_2 < \cdots < t_k$, $t_0 = 0$,

d_i – numer of events in time t_i,

n_i – number of units observed in time t_i, $n_i = n_{i-1} - d_{i-1} - z_{i-1}$,

z_i – number of censored observations in time t_i.

To compare the duration of the phenomena, the significance of differences between the two survival curves is tested. We then verify the null hypothesis $H_0: S_1(t) = S_2(t)$. Depending on the research problem, we can consider one of the following alternative hypotheses: $H_1: S_1(t) \neq S_2(t)$, $H_1: S_1(t) > S_2(t)$ or $H_1: S_1(t) < S_2(t)$.

Formula 3:

$$h(t) = \lim_{\Delta t \to 0} \frac{P(t \leq T < t + \Delta t | T \geq t)}{\Delta t} \tag{3}$$

Formula 4:

$$\hat{h}_j = \frac{d_j}{n_j \tau_j} \text{ dla } j = 1, 2, \ldots, k \tag{4}$$

where:

d_j – number of events in the j-th time interval,
n_j – the number of units observed in the j-th time interval,
τ_j – the length of j-th time interval.

Formula 5:

$$h(t: x_1, x_2, \dots, x_n) = h_0(t)\exp(a_1 x_1 + a_2 x_2 + \dots + a_n x_n) \tag{5}$$

where:
$x_1, x_2, \dots, x_n$ – independent variables,
$h_0(t)$ – base hazard or zero hazard line,
$a_1, a_2, \dots, a_n$ – model coefficients,
t – observation period.

Formula 6:

$$\mathrm{logit}(p) = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \sum_{i=1}^{n} \beta_i x_i \tag{6}$$

where:
$p = P(Y = 1 | x_1, x_2, \dots, x_n)$ – conditional probability of occurrence of an event,
$x_1, x_2, \dots, x_n$ – independent variables,
$\beta_1, \beta_2, \dots, \beta_n$ – model coefficients.

The coefficients of the logit model allow to determine the chance (odds/risk) of an event occurring at moment *t* in the selected group in relation to the reference group. Relative risk is determined by the formula *OR* = $\exp(\beta_i)$.