

19. (SOA) For a mortality study with right-censored data, you are given:

t_i	d_i	Y_i	$\frac{d_i}{Y_i(Y_i - d_i)}$	$\hat{S}(t_i)$	$\int_{t_i}^{\infty} \hat{S}(t) dt$
1	15	100	0.0018	0.8500	14.424
8	20	65	0.0068	0.5885	8.474
17	13	40	0.0120	0.3972	3.178
25	31	31	---	0.0000	0.000

Calculate the estimate of the variance of the Nelson-Aalen estimator of the cumulative hazard function at time 20.

- (A) Less than 0.005
- (B) At least 0.005, but less than 0.010
- (C) At least 0.010, but less than 0.015
- (D) At least 0.015, but less than 0.020
- (E) At least 0.020

20. A mortality study estimates the survival distribution of a rat that has just been diagnosed with mad rat disease. The study is based on 80 times of death summarized in monthly grouped form. There is no censoring or truncation in the study. The data summary is:

Month	1	2	3	4	5	6	7	8
# of deaths	15	5	10	20	10	10	5	5

Find the log-transformed 95% confidence interval for $S(2.5)$.

Use the following information from a survival study of 10 lives for Questions 21 and 22.

Time	1	3	4	8	10
Deaths	2	2	0	2	2
Right-Censoring	0	1	1	0	0

21. Determine the estimated mean time until death as measured from time 0.

- A) 6.0
- B) 6.2
- C) 6.4
- D) 6.6
- E) 6.8

22. Determine the upper limit of the 95% linear confidence interval for $S(4)$.

- A) .70
- B) .75
- C) .80
- D) .85
- E) .90