



BIOSTATISTICS AND SURVIVAL ANALYSIS

Project Work



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Objective: To compare the recurrence time of breast cancer between premenopausal patients and postmenopausal patients and between hormonal therapy and not taken, using Kaplan-Meier estimation procedure.

Procedure and Findings:

The data consists of details of 686 patients with their age, menopausal status, size of tumour, tumour grade, no. of positive lymph nodes, progesterone receptors, estrogen receptors, hormonal therapy and the recurrence free survival time (in days).

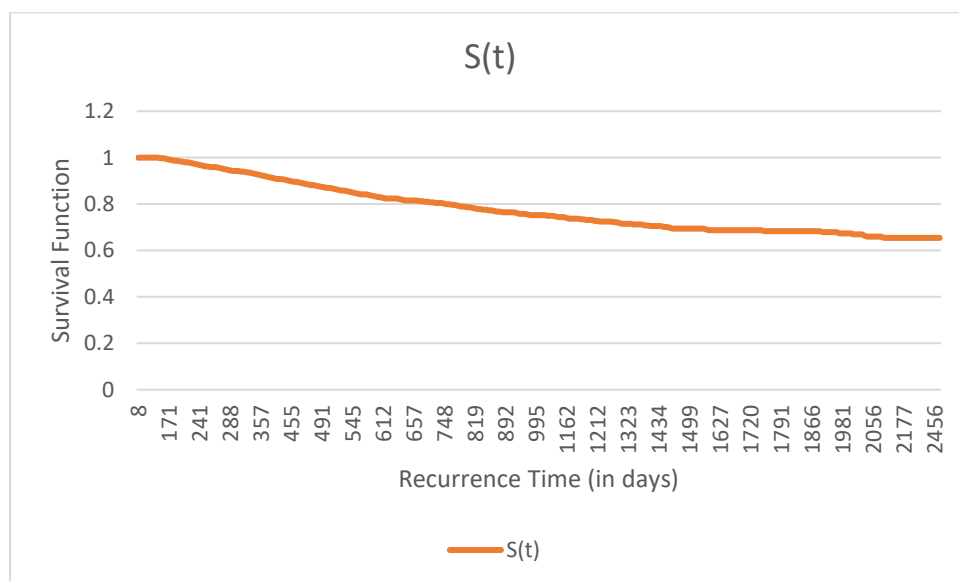
Our aim is to observe the differences between the two datasets categorised on the basis of menopausal status when affected by cancer and also between the datasets categorised on the basis of hormonal therapy taken or not.

The time of censoring was taken to be 7 years (Type- I censoring). The data consisted of 7 years and some months. To get a uniformity, we had chosen this time period of censoring. However, it does not matter as Kaplan-Meier Estimation procedure does not use the censored observations,

Based on menopausal status:

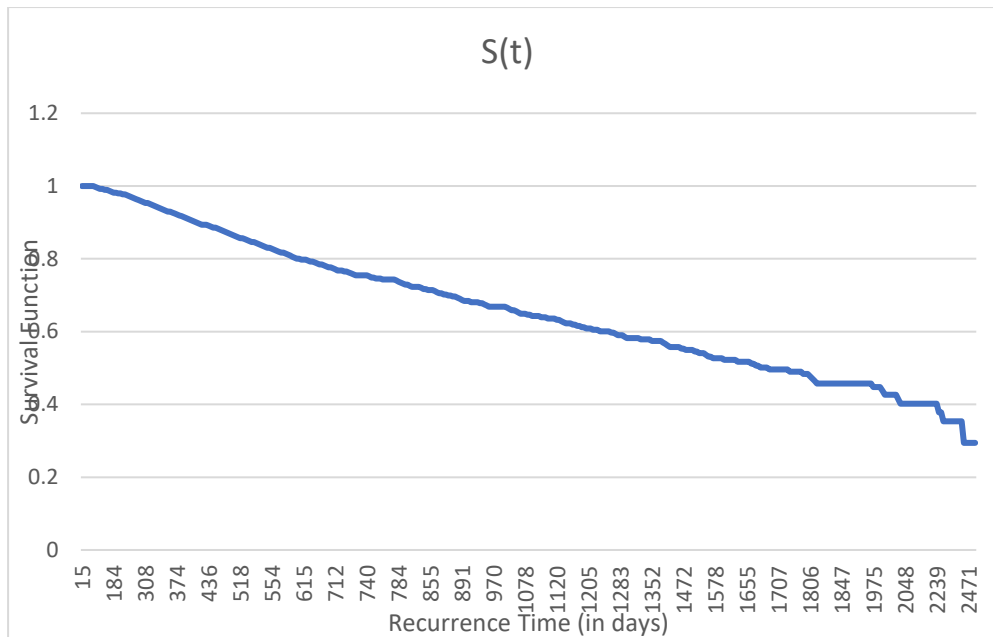
When we apply Kaplan-Meier Estimation Procedure to the categorised data, we get the following graphs.

1. Premenopausal:



This data consisted of 290 observations, out of which 119 were censored. We observe that we do not get a median survival time from this data.

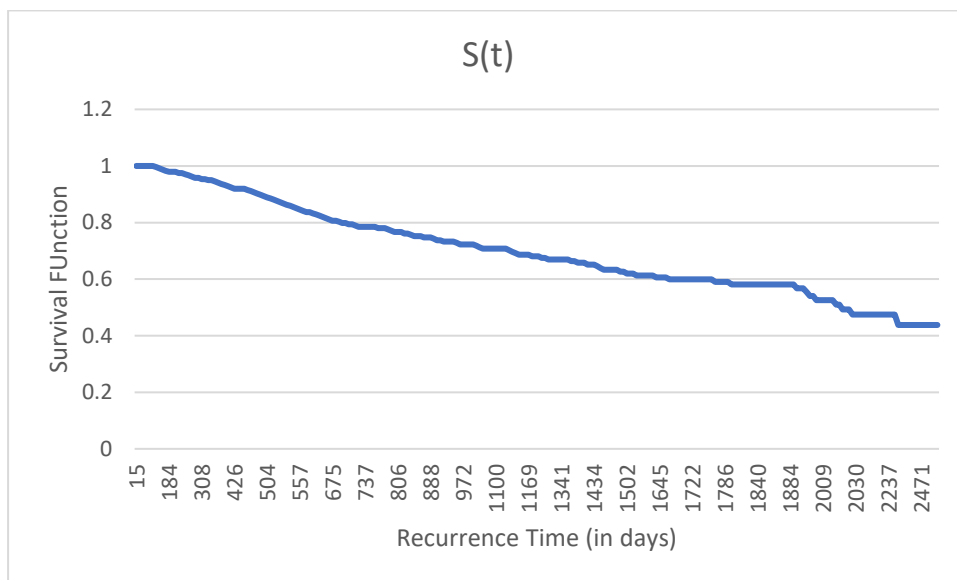
2. Postmenopausal:



This data consisted of 396 observations, out of which 180 were censored. Here, we can see that the median survival time or median time of recurrence of breast cancer is approximately 1680 days, i.e. four and a half years.

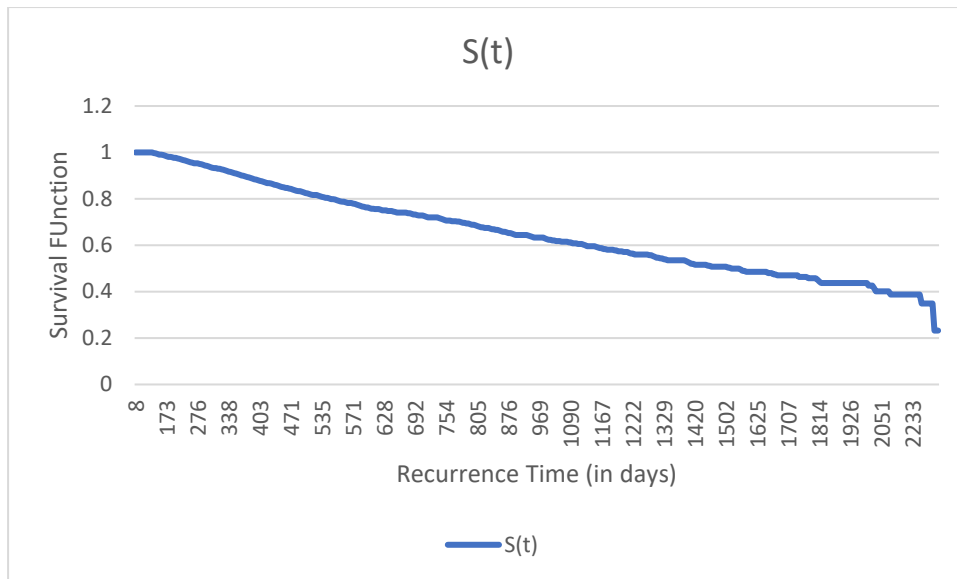
Based on hormonal therapy:

1. Hormonal therapy taken:



This data consisted of 246 observations, out of which 96 were censored. The median cancer recurrence time is approximately 2015 days, i.e. five and a half years.

2. Hormonal therapy not taken:



This data consisted of 440 observations, out of which 205 were censored. Here, the median time for cancer to reoccur is seen to be 1500 days, i.e. 4 years approximately.

Conclusion:

Thus, we can see that it took 5.5 years for breast cancer to reoccur in case of the women who took hormonal therapy during cancer treatment and 4 years in case of the women who did not. Hence, it suggests that hormonal therapy can lead to longevity of life and delaying of recurrence of breast cancer.

There is also a medical information which says, "It does not matter if you have reached menopause or not. You are equally probable to get breast cancer."

This could not be proven with the limited dataset as the median survival time could not be found in the case of premenopausal patients.