Project Members: Oladipo Afolayan, Jeremiah Akpabio, Sandile Ndabezitha, Francis Nkansah, Aaron Niecestro

Title: Comparative Study of a Stochastic Pure Death Process and Cox Proportional Hazard Models in analyzing survival of breast cancer in Netherlands Women

Abstract:

This study aims to obtain a pure death process model and Cox proportional hazard model to predict the hazard rates for 272 women with breast cancer in the Netherlands. The death rates were calculated using the breast cancer patient data as crude and time-dependent rates as an initial value for mu (μ) to create the simulations in the pure death process. The pure death process will run ten thousand simulations to calculate the summary statistics (mean, standard deviation, standard error, and coverage probability) of the population size and death rates after approximately 18.4 years. These values were then compared to the Netherlands' actual estimates. We calculated the average yearly survival population for 19 years from the simulations to estimate the Kaplan-Meier and Nelson-Aalen estimators. Furthermore, this paper will compare the efficacy of the pure death process and Cox proportional hazard models.