PB8116 Midterm Exam, 2019

Xinyi Lin

xl2836

Disease D is a chronic neurological condition that leads to fast deterioration of motor and cognitive functions and eventually leads to death. Based on a theoretical model, the survival time of a patient suffered from disease D very much depends on his or her disease onset age. To be specific, let as the survival time of a patient, and be the disease onset age, the conditional distribution for given is exponential with failure rate .

Since D is a chronic condition, its actual onset times are often unobserved. Suppose the disease onset ages in a population also follows an exponential with failure rate , where is an unknown parameter. Suppose are observed survival times of patients with disease D in a population. The public health researchers are interested in estimating the parameter in the population so that they could design disease prevention policies on target ages.