

# Threshold Regression: Survival Analysis Based on First Hitting Times

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## **Abstract**

Considerable research has investigated first hitting times as models for survival data. First hitting times arise naturally in many stochastic processes, ranging from Wiener processes to Markov chains. In a survival context, the state of the underlying process represents the strength of an item or the health of an individual. The item fails or the individual experiences a clinical endpoint when the process reaches a threshold state of critical weakness for the first time. The threshold state thus defines a stopping condition for the process. Threshold regression refers to first hitting time models with regression structures that accommodate covariate data. The parameters of both the process and the threshold state may depend on the covariates. This talk will review aspects of this topic and discuss fruitful avenues for future research.