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## A Smooth Test of Goodness-of-fit for the Baseline Hazard Function in Recurrent Event Models

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### ABSTRACT

In this paper, we formulate a smooth test of goodness-of-fit for a simple hypothesis about the baseline hazard function in recurrent-event models. The formulation is an extension of Neyman's goodness-of-fit approach, whose score tests are obtained by embedding the null hypothesis in a larger class of hazard rate functions. Since the application is in recurrent event models, the data is dynamic. A useful feature about this test is the parametric approach that makes inference about the hazard function more efficient. To examine the finite-sample properties of this test, we used simulated data. For validation, we applied the test to a real-life recurrent event data. Results show that the test possesses better power over wide range of alternatives, when compared with similar tests of the chi-square type in the literature.

**Key words:** baseline hazard function; goodness-of-fit; power; recurrent events; smooth tests