

Identifying predictors for features of viral rebound trajectories after antiretroviral therapy (ART) interruption is central for HIV cure research. Motivated by the need to assess whether the time to viral suppression after ART initiation is predictive of the time to viral rebound after ART interruption, we investigate modeling approaches relating an interval-censored outcome (e.g., time to viral rebound) and an interval-censored covariate (e.g., time to viral suppression). To this end, we present a proportional hazards regression model and use an Expectation-Maximization algorithm for parameter estimation, where the observed data are augmented with Poisson random variables to facilitate computation. In addition, some individuals experienced multiple episodes of treatment initiation and interruption. We extend the method to accommodate the clustering effect where estimation is based on the independent composite likelihood function. We evaluate the finite-sample performance of the proposed procedure for both independent and clustered settings through simulation studies. We apply it to data from the Zurich Primary HIV Infection Cohort to assess the effect of time to HIV viral suppression after antiretroviral treatment initiation on time to viral rebound after treatment interruption.