



# Estimation of complier causal treatment effects with informatively interval-censored failure time data

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Received: 21 November 2022 / Revised: 27 March 2023 / Accepted: 4 April 2023 /  
Published online: 15 May 2023  
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## Abstract

Estimation of complier causal treatment effects has been discussed by many authors under different situations but only limited literature exists for interval-censored failure time data, which often occur in many areas such as longitudinal or periodical follow-up studies. Particularly it does not seem to exist a method that can deal with informative interval censoring, which can happen naturally and make the analysis much more challenging. Also, it has been shown that when the informative censoring exists, the analysis without taking it into account would yield biased or misleading results. To address this, we propose an estimated sieve maximum likelihood approach with the use of instrumental variables. The asymptotic properties of the resulting estimators of regression parameters are established, and a simulation study is performed and suggests that it works well. Finally, it is applied to a set of real data that motivated this study.

**Keywords** Causal inference · Informative censoring · Interval-censored data · Proportional hazards model

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