

**Estimation of adjusted NNT measures for time-to-event outcomes  
by means of the Cox regression model**

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In medical research number needed to treat (NNT) measures for time-to-event outcomes have been proposed for use in randomized controlled trials without consideration of covariates (Altman & Andersen, *BMJ* 1999, 319: 1492-1495). To assess the effect of exposures in epidemiological studies it is usually required to take the effect of covariates into account. In this paper, we propose adjusted NNT measures for time-to-event outcomes within the framework of the Cox regression model including covariates. Estimation of the adjusted NNT measures is performed by using the recently proposed average risk difference approach in logistic regression (Bender et al., *Stat. Med.* 2007, 26: 5586-5595). Within this approach, the effect of exposures is described by means of the two NNT measures "number needed to be exposed" (NNE) and "exposure impact number" (EIN), where the considered reference group is given by the population of exposed and unexposed persons, respectively. Standard errors and confidence intervals for the adjusted NNT estimates were derived by using bootstrapping. The performance of the proposed point and interval estimates for the adjusted NNT measures is evaluated by means of a simulation study demonstrating adequate features in terms of MSE and coverage probability. The proposed approach to estimate adjusted NNT measures in the Cox model is illustrated by application to data of the Düsseldorf obesity mortality study (Bender et al., *Am. J. Epidemiol.* 147: 42-48).