

Statistica Sinica Preprint No: SS-2016-0246R2

Title	Semiparametric random-effects conditional density models for longitudinal analysis with concomitant intervention
Manuscript ID	SS-2016-0246.R2
URL	http://www.stat.sinica.edu.tw/statistica/
DOI	10.5705/ss.202016.0246
Complete List of Authors	Colin Wu Tianqing Liu Zhaohai Li and Yuanzhang Li
Corresponding Author	Colin Wu
E-mail	wuc@nhlbi.nih.gov, drcowu@gmail.com
Notice: Accepted version subject to English editing.	

eters through a computationally intensive maximum likelihood procedure. Xing and Ying (2012) studied a semiparametric change-point regression model based on a counting process formulation; their regression model assumes environmental change-points with unknown number and locations, and differs from the setup of subject-specific concomitant interventions.

We develop a class of semiparametric random-effects conditional density (RECD) models for evaluating the conditional distributions of the outcome variable and the concomitant intervention effects in a longitudinal study. By quantifying the distribution functions of the outcome variable before and after the concomitant intervention through subject-specific random-effects, our models assume that the ratio of the conditional density functions of the subject's time-dependent outcome variable to a known form specified by some unknown parameters, where the underlying baseline density remains nonparametric. This modeling framework has the attractive feature that it simultaneously accommodates the intra-subject longitudinal dependence and the concomitant intervention effects. Our RECD models do not require the conditional distributions to be completely specified by a parametric form; they can be applied to studies with patients who may or may not receive concomitant interventions during the study. We develop a conditional likelihood-based estimation method for parameter estimation

