Supplement to: "Penalized Logistic Regression Likelihood Ratio Test Analysis to Detect Signals of Adverse Events from Interactions in Postmarket Safety Surveillance"

1 Simulation Comparing Different Penalty Selection Methods

Table S1 shows the results of a simulation study comparing different approaches for selecting the penalty term of the logistic regression model described in Section 4.1 of the main paper. The simulation scenario used here was the logistic regression scenario described in Section 6 of the main paper (in particular, see equation (12) of the main paper). Table S1 shows the power, FDR, and sensitivity for different approaches for penalty selection. In Table S1, PLR-LRT (original) corresponds to the penalty selection described in Section 4.2 of the main paper. PLR-LRT (L2 CV) corresponds to using a penalized logistic regression model with an L_2 penalty function with the penalty term selected by 10-fold cross-validation. PLR-LRT (L1 CV) corresponds to using a penalized logistic regression model with an L_1 penalty function with the penalty term selected by 10-fold cross-validation.

	PLR-LRT (original)				PLR-LRT (L2 CV)				PLR-LRT (L1 CV)			
γ^*	1.5	1.0	0.5	0.0	1.5	1.0	0.5	0.0	1.5	1.0	0.5	0.0
Power	1.00	0.81	0.05	0.00	0.99	0.88	0.16	0.01	0.87	0.51	0.14	0.02
FDR	0.15	0.01	0.01	0.00	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01
Sensitivity	0.92	0.50	0.03	NA	0.73	0.50	0.12	NA	0.48	0.24	0.06	NA

Table S1: **Simulation Study Results.** The table shows the computed power, FDR, and sensitivity for different approaches for selecting the penalty of the logistic regression model. The table shows the results for the logistic regression model for the AE probabilities described in Section 6 of the main paper. Power, FDR, and Sensitivity were computed using 200 simulation replications. The methods compared include: (1) PLR-LRT (original) which is the empirical Bayes L_2 penalty described in Section 4.2 of the main paper, (2) PLR-LRT (L2-CV) which is an L_2 penalty function with the penalty chosen through 10-fold cross-validation, (3) PLR-LRT (L1-CV) which is an L_1 penalty function with the penalty chosen through 10-fold cross-validation.