Supplementary Tables

Table 1: Simulation results for variance estimation of the EB estimator for the 2×4 table. Here $\hat{V}_A$ is the delta method variance estimate proposed in equation (3) of the main text whereas V_E is the empirical variance of $\hat{\beta}_{EB}$.

		Sample Size		
		$n_0 = n_1 = 100$	$n_0 = n_1 = 200$	$n_0 = n_1 = 500$
θ_{GE}=1	$\hat{V}_A$	0.30	0.15	0.06
	V_E	0.31	0.14	0.05
$\theta_{GE} = 1.25$	$\hat{V}_A$	0.31	0.16	0.07
	V_E	0.30	0.15	0.06
$\theta_{GE} = 1.5$	$\hat{V}_A$	0.34	0.18	0.08
	V_E	0.33	0.17	0.08
$\theta_{GE} = 2.00$	$\hat{V}_A$	0.39	0.21	0.09
	V_E	0.39	0.21	0.09

Table 2: Simulation results for variance estimation of the EB estimator with one genetic factor (G) and two environmental exposures (E_1, E_2). The joint distribution of (G, E_1, E_2) in the controls was specified by the following restrictions: $P(E_1 = 1) = 0.3, P(E_2 = 1) = 0.3, OR_{E_1 E_2} = 2.0,$ $P(G = 1) = 0.3, OR_{GE_1} = 1, OR_{GE_2} = 1.5$. The parameters for the disease risk model were set at $\beta_G = \beta_{E_1} = \beta_{E_2} = 0$, i.e., no main effects of G or E are present, however interaction effects are present with $\beta_{G*E_1} = \beta_{G*E_2} = \log(2)$. $\hat{V}_A$ corresponds to the estimate of the variance as obtained from the diagonal entries of the approximate variance-covariance derived in the appendix and V_E is the empirical variance.

		$n_0 = n_1$=100	$n_0 = n_1$=200	$n_0 = n_1 = 500$
$\hat{\beta}_G$	$\hat{V}_A$	0.20	0.08	0.05
	V_E	0.18	0.09	0.04
$\hat{\beta}_{E_1}$	$\hat{V}_A$	0.18	0.08	0.03
	V_E	0.16	0.07	0.03
$\hat{\beta}_{E_2}$	$\hat{V}_A$	0.20	0.06	0.04
	V_E	0.17	0.07	0.03
$\hat{\beta}_{G*E_1}$	$\hat{V}_A$	0.34	0.16	0.06
	V_E	0.29	0.14	0.06
$\hat{\beta}_{G*E_2}$	$\hat{V}_A$	0.33	0.16	0.06
	V_E	0.30	0.15	0.07