

Supplemental Material S5.

Summary of sensitivity, specificity of FaST-LMM-EWASher, RefFreeEWAS, RefFreeCellMix, ReFACTOR, SVA, as well as results when “latent factors” were not adjusted. Results were based on 100 simulated data across three settings ($\rho=0, 0.3,$ and 0.7) each with different numbers of important CpGs (50, 100, and 150).

	Number of Important CpGs =50					
	Sensitivity(Median, 95% interval)			Specificity(Median, 95% interval)		
	$\rho=0$	$\rho=0.3$	$\rho=0.7$	$\rho=0$	$\rho=0.3$	$\rho=0.7$
Unadjusted	0.96(0.47, 1)	1(1,1)	1(1, 1)	1(0.987, 1)	0.21(0.00, 0.99)	0(0, 0)
Ewasher	0(0, 0)	0(0, 0)	0(0, 0)	1(0.999, 1)	1(0.999, 1)	1(0.999, 1)
RefFreeEWAS	1(0.96, 1)	0.982(0.437, 1)	0(0, 0.494)	0.997(0.994, 0.999)	0.996(0.993, 0.999)	0.579(0.055, 1)
SVA	1(0.98, 1)	1 (0.98, 1)	1(0.96, 1)	0.998(0.996, 1)	0.998 (0.996, 1)	0.998(0.996, 1)
Refactor	1(0.96, 1)	1(1,1)	1(1, 1)	0.996(0.825, 1)	0.042 (0, 0.711)	0(0, 0)
RefFreeCellMix	1(0.98, 1)	1(1, 1)	1(1, 1)	0.997(0.993, 0.999)	0.983(0.930, 0.997)	0.546(0.199, 0.923)
	Number of Important CpGs =100					
Unadjusted	0.98(0.664, 1)	1(1, 1)	1(1, 1)	0.999(0.976, 1)	0.205(0.000, 0.981)	0(0, 0)
Ewasher	0(0, 0)	0(0, 0)	0(0, 0)	1(0.999, 1)	1(0.999, 1)	1(0.999, 1)
RefFreeEWAS	1(0.965, 1)	0.98 (0.392, 1)	0(0, 0.403)	0.995(0.991, 0.998)	0.994(0.991, 0.998)	0.52(0.014, 1)
SVA	1(0.99, 1)	1 (0.99, 1)	0.99(0.965, 1)	0.996(0.993, 0.999)	0.996(0.993, 0.998)	0.996(0.993, 0.999)
Refactor	1(0.965, 1)	1(1,1)	1(1,1)	0.994(0.808, 0.998)	0.042 (0, 0.695)	0(0, 0)
RefFreeCellMix	1(0.975, 1)	1 (1,1)	1 (1,1)	0.988(0.968, 0.996)	0.889(0.685, 0.976)	0.211(0.047, 0.525)
	Number of Important CpGs =150					
Unadjusted	0.993(0.723, 1)	1 (1, 1)	1 (1, 1)	0.999(0.965, 1)	0.204(0.000, 0.972)	0(0, 0)
Ewasher	0(0, 0)	0(0, 0)	0(0, 0)	1(0.999, 1)	1(0.999, 1)	1(0.999, 1)
RefFreeEWAS	0.993(0.973, 1)	0.98(0.318, 1)	0(0, 0.294)	0.992(0.986, 0.997)	0.992(0.986, 0.999)	0.496(0.013, 1)
SVA	1(0.993, 1)	1(0.993, 1)	0.993(0.970, 1)	0.992(0.988, 0.996)	0.992(0.989, 0.996)	0.993(0.988, 0.996)
Refactor	1(0.98, 1)	1(1,1)	1(1,1)	0.989(0.794, 0.997)	0.042 (0, 0.674)	0(0, 0)
RefFreeCellMix	1(0.983, 1)	1(1,1)	1(1,1)	0.975(0.929, 0.993)	0.744(0.471, 0.939)	0.098(0.022, 0.293)

Footnote: ρ = correlation between primary covariate and latent variables. $\rho = 0$ corresponds to data simulated from Scenario 1, while $\rho=0.7$ corresponds to data simulated from Scenario 2.