

Estimator	Relationship					
	FS	HS	C1	C2	C3	IN
$\hat{\Phi}_D$	1.32	2.68	5.63	22.28	90.47	5.27
$\hat{\Phi}_G$	1.26	2.02	3.76	14.12	59.52	4.67
$\hat{\Phi}_R$	1.00	1.80	3.66	14.82	62.81	4.58
$\hat{\Phi}_T$	0.92	1.77	3.63	14.10	59.56	4.60
$\hat{\Phi}_W$	1.26	1.98	3.76	12.97	54.25	4.78
$\hat{\Phi}_H$	1.09	1.75	2.63	6.27	21.74	3.97

Table S8 Estimation accuracies from simulation study (African ancestry) as measured by the ratio ($\times 10^2$) of the square root of MSE and the average realized kinship.