

Heritability Estimation using a Regularized Regression Approach (HERRA): Applicable to Continuous, Dichotomous or Survival Outcome

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S1 Table: Tables of simulation results

The following S1 Table provides details of simulation results that are summarized by figures in the main text - continuous trait, one chromosome.

Table S1. Simulation results of continuous trait and one chromosome: empirical mean (empirical $SD \times 10^2$), relative efficiency (RE), and mean-squared error (MSE) $\times 10^4$. For HERRA, RE is defined as the ratio of the variance of GCTA's estimator to the variance of HERRA's estimator. RE greater than 1 indicates that HERRA's estimator is more efficient. p equals the number of causal SNPs.

| p | h^2 | | | σ_e^2 | σ_Y^2 | σ_g^2 | |
|---|-----------|--------------|-------|--------------|--------------|--------------|---------------|
| | mean (SD) | RE | MSE | mean (SD) | mean (SD) | mean (SD) | |
| true values: $h^2 = 0.1$; $\sigma_e^2 = 1$; $\sigma_Y^2 = 1.111$; $\sigma_g^2 = 0.111$ | | | | | | | |
| $N = 5000$ | | | | | | | |
| 100 | H | 0.105 (1.28) | 1.702 | 1.930 | 0.986 (2.08) | 1.102 (2.17) | - |
| | L | 0.089 (1.46) | 1.308 | 3.342 | 1.004 (2.37) | - | 0.098 (1.65) |
| | G | 0.095 (1.67) | 1.000 | 3.049 | 0.998 (2.46) | - | 0.105 (1.88) |
| 250 | H | 0.109 (1.26) | 1.098 | 2.357 | 0.993 (2.15) | 1.109 (2.32) | - |
| | L | 0.103 (1.49) | 0.785 | 2.310 | 0.999 (2.23) | - | 0.115 (1.17) |
| | G | 0.105 (1.32) | 1.000 | 1.980 | 0.996 (2.21) | - | 0.117 (1.53) |
| $N = 10000$ | | | | | | | |
| 100 | H | 0.105 (0.74) | 1.414 | 0.759 | 0.988 (1.41) | 1.104 (1.61) | - |
| | L | 0.089 (0.92) | 0.915 | 2.056 | 1.005 (1.52) | - | 0.098 (1.06) |
| | G | 0.098 (0.88) | 1.000 | 0.827 | 0.996 (1.51) | - | 0.108 (1.02) |
| 250 | H | 0.103 (0.70) | 1.306 | 0.574 | 0.996 (1.46) | 1.110 (1.51) | - |
| | L | 0.098 (0.81) | 1.269 | 0.696 | 0.999 (1.53) | - | 0.109 (0.93) |
| | G | 0.097 (0.80) | 1.000 | 0.713 | 0.999 (1.54) | - | 0.108 (0.92) |
| true values: $h^2 = 0.6$; $\sigma_e^2 = 1$; $\sigma_Y^2 = 2.5$; $\sigma_g^2 = 1.5$ | | | | | | | |
| $N = 5000$ | | | | | | | |
| 100 | H | 0.584 (1.07) | 1.688 | 3.641 | 0.998 (2.26) | 2.400 (4.80) | - |
| | L | 0.625 (1.04) | 1.786 | 7.332 | 0.989 (2.58) | - | 1.649 (0.049) |
| | G | 0.587 (1.39) | 1.000 | 3.545 | 0.978 (2.65) | - | 1.393 (5.70) |
| 250 | H | 0.582 (0.91) | 1.887 | 4.177 | 1.041 (2.46) | 2.489 (5.04) | - |
| | L | 0.563 (1.13) | 1.224 | 14.967 | 1.047 (2.87) | - | 1.349 (4.25) |
| | G | 0.578 (1.25) | 1.000 | 6.580 | 1.016 (2.86) | - | 1.390 (4.87) |
| $N = 10000$ | | | | | | | |
| 100 | H | 0.580 (0.67) | 1.253 | 4.291 | 1.008 (1.50) | 2.403 (3.71) | - |
| | L | 0.563 (0.85) | 0.779 | 14.413 | 1.061 (1.18) | - | 1.367 (3.45) |
| | G | 0.576 (0.75) | 1.000 | 6.565 | 0.992 (1.63) | - | 1.345 (3.14) |
| 250 | H | 0.590 (0.70) | 1.653 | 1.490 | 1.021 (1.69) | 2.491 (3.19) | - |
| | L | 0.563 (0.80) | 1.266 | 14.330 | 1.047 (1.77) | - | 1.351 (3.28) |
| | G | 0.582 (0.90) | 1.000 | 4.159 | 1.012 (1.73) | - | 1.407 (4.05) |

H - HERRA, L - LDAK, G - GCTA