**S5 Table:** Alternative PRSs’ Performance in unrelated EUR samples of the UK Biobank Study. Methods were order by decreasing pseudo-R2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cancer Trait:Sample Sizein UKB** | **Method** | **TuningParameter\*** | **# SNPs** | **PRS Performance** | **Association** |
| **Pseudo-R2** | **Brier Score** | **AdjustedAUC** | **Odds Ratio** | **P** |
| Breast Cancer: 14,109 Cases214,164 Controls | CSPRS(PRS-CS) | Default “auto” | 1,120,410 | 0.0460 | 0.0564 | 0.653(0.648, 0.657) | 1.771(1.739, 1.803) | 5.4e-857 |
| LSPRS(Lassosum) | s = 0.5;l = 0.00546 | 44,576 | 0.0423 | 0.0565 | 0.645(0.641, 0.650) | 1.710(1.680, 1.740) | 3.5e-780 |
| LPPRS(LDPred) | p(causal) = 0.03 | 6,477,992 | 0.0367 | 0.0566 | 0.637(0.633, 0.642) | 1.670(1.640, 1.699) | 5.4e-695 |
| CTPRS(C+T) | P <= 2.50e-5 | 1,056 | 0.0357 | 0.0567 | 0.633(0.628, 0.637) | 1.630(1.602, 1.659) | 9.1e-661 |
| GPRS | P <= 5.0e-8 | 334 | 0.0329 | 0.0568 | 0.628(0.623, 0.632) | 1.594(1.567, 1.622) | 1.7e-613 |
| Prostate Cancer:6,561 Cases182,590 Controls |  CSPRS (PRS-CS) | Default “auto” | 1,120,596 | 0.0674 | 0.0316 | 0.702(0.695, 0.708) | 2.140(2.085, 2.197) | 4.2e-711 |
| LSPRS(Lassosom) | s = 0.5;l = 0.00695 | 26,265 | 0.0652 | 0.0316 | 0.700(0.693, 0.706) | 2.127(2.072, 2.184) | 3.7e-692 |
| LDPRS(LDPred) | p(causal) = 0.03 | 3,570,040 | 0.0583 | 0.0317 | 0.688(0.682, 0.695) | 2.030(1.978, 2.084) | 1.7e-618 |
| CTPRS(C+T) | P <= 7.94e-5 | 1396 | 0.0570 | 0.0318 | 0.688(0.682, 0.695) | 2.020(1.968, 2.074) | 8.9e-610 |
| GPRS | P <= 5.0e-8 | 377 | 0.0521 | 0.0319 | 0.680(0.674, 0.687) | 1.943(1.894, 1.993) | 3.1e-566 |

\* Based on evaluation in MGI cohort