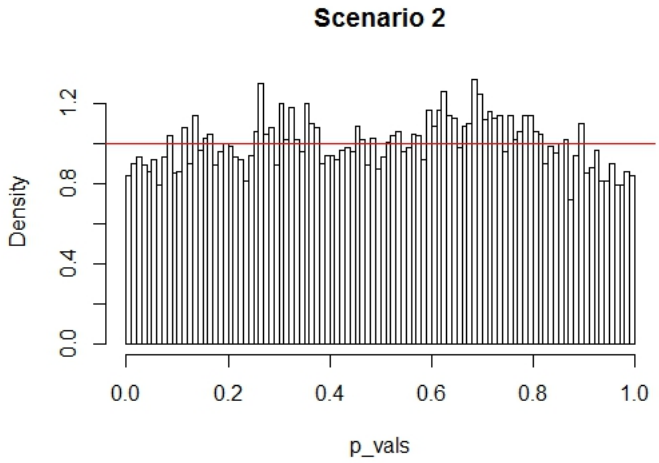
Simulation results

Sept. 8th 2015

- **Scenario 1** Trait model: binary trait, no ascertainment, no covariates and no additive variance (i.e. $\sigma_a^2 = 0$).
  Permutation model: LMM with $\sigma_a^2 = 0$ and no covariates.

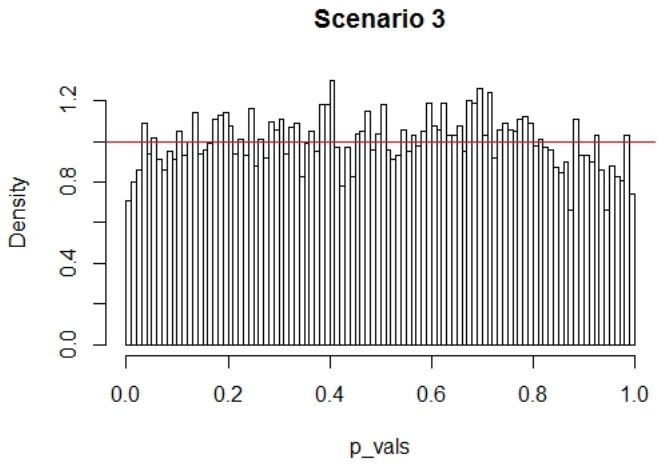
  → *Re-running simulation*

- **Scenario 2** Trait model: binary trait, no ascertainment, no covariates and no additive variance (i.e. $\sigma_a^2 = 0$).
  Permutation model: EE with $\sigma_a^2 = 0$ and no covariates.



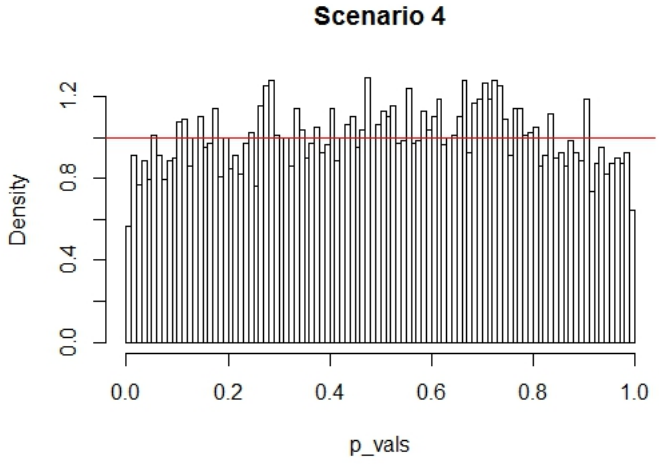
Type 1 error	Actual	SE	p-value
0.005	0.0040	0.0006	0.178
0.010	0.0084	0.0009	0.119
0.050	0.0442	0.0021	0.008

- **Scenario 3** Trait model: binary trait, no ascertainment, no covariates and no additive variance (i.e. $\sigma_a^2 = 0$).
  Permutation model: LMM with no covariates (optimize over $\sigma_a^2 \geq 0$).



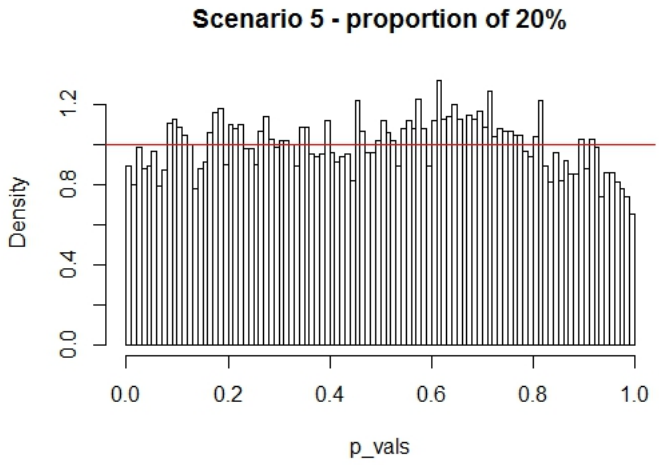
Type 1 error	Actual	SE	p-value
0.005	0.0033	0.0006	0.0019
0.010	0.0071	0.0008	0.0042
0.050	0.0440	0.0021	0.0063

- **Scenario 4** Trait model: binary trait, no ascertainment, no covariates and no additive variance (i.e. $\sigma_a^2 = 0$).
  Permutation model: EE with no covariates (optimize over $\sigma_a^2 \geq 0$).

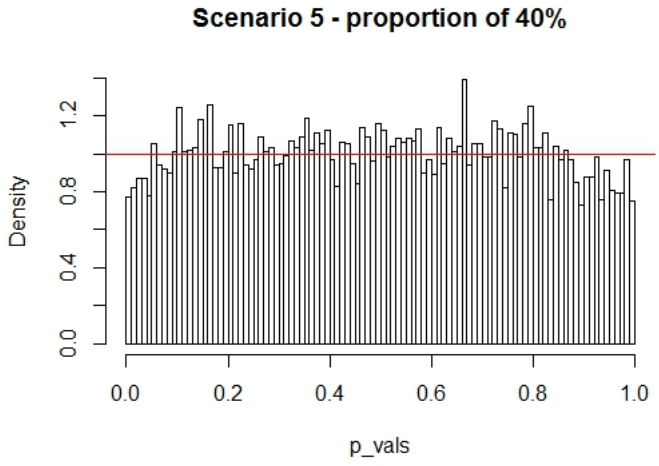


Type 1 error	Actual	SE	p-value
0.005	0.0030	0.0006	0.0167
0.010	0.0057	0.0008	0.0002
0.050	0.0394	0.0022	<0.0001

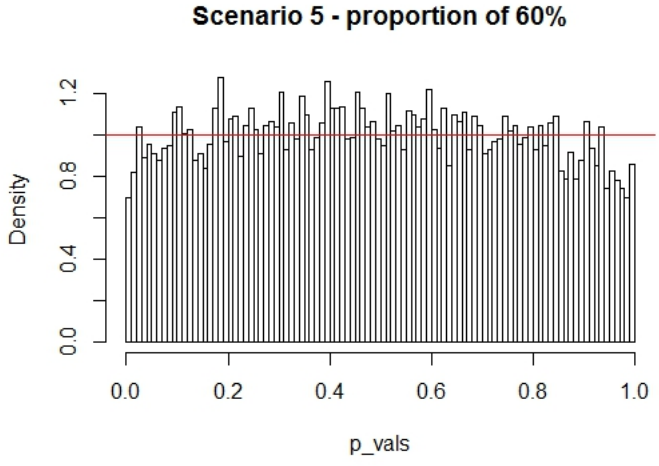
- **Scenario 5** Trait model: binary trait, no ascertainment, no covariates and positive additive variance (i.e. prop. of total variance $= 0.2, 0.4, 0.6$).
  Permutation model: LMM with no covariates (optimize over $\sigma_a^2 \geq 0$).



Type 1 error	Actual	SE	p-value
0.005	0.0045	0.0007	0.523
0.010	0.0089	0.0009	0.291
0.050	0.0445	0.0021	0.012

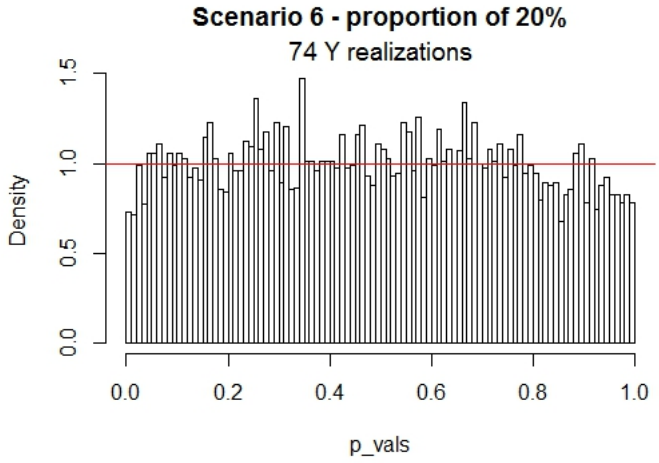


Type 1 error	Actual	SE	p-value
0.005	0.0041	0.0006	0.228
0.010	0.0077	0.0009	0.024
0.050	0.0411	0.0021	<0.0001

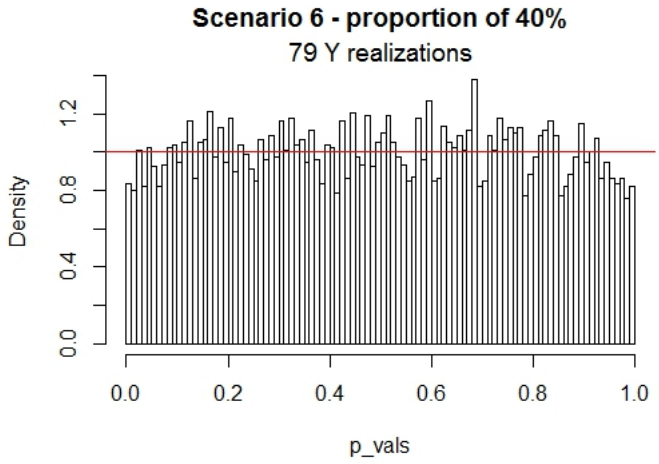


Type 1 error	Actual	SE	p-value
0.005	0.0036	0.0006	0.056
0.010	0.0070	0.0008	0.003
0.050	0.0441	0.0021	0.007

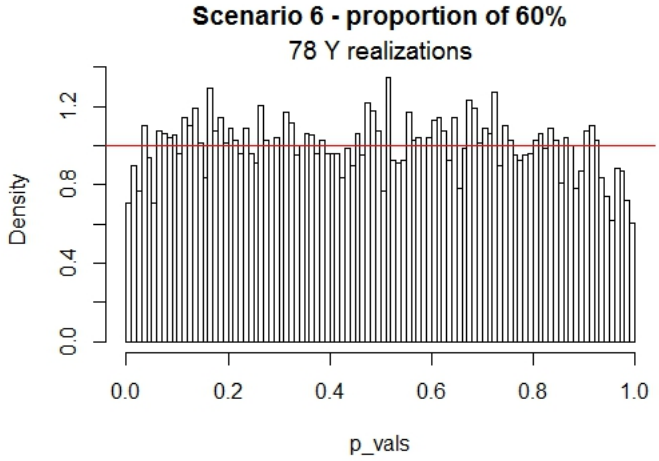
- **Scenario 6** Trait model: binary trait, no ascertainment, no covariates and positive additive variance (i.e. prop. of total variance $= 0.2, 0.4, 0.6$).
  Permutation model: EE with no covariates (optimize over $\sigma_a^2 \geq 0$).



Type 1 error	Actual	SE	p-value
0.005	0.0034	0.0007	0.058
0.010	0.0073	0.0010	0.023
0.050	0.0426	0.0023	0.004



Type 1 error	Actual	SE	p-value
0.005	0.0041	0.0007	0.264
0.010	0.0084	0.0010	0.158
0.050	0.0449	0.0023	0.041



Type 1 error	Actual	SE	p-value
0.005	0.0027	0.0006	0.049
0.010	0.0071	0.0009	0.010
0.050	0.0441	0.0023	0.018