

Validate Power: d3.1

December 27, 2021

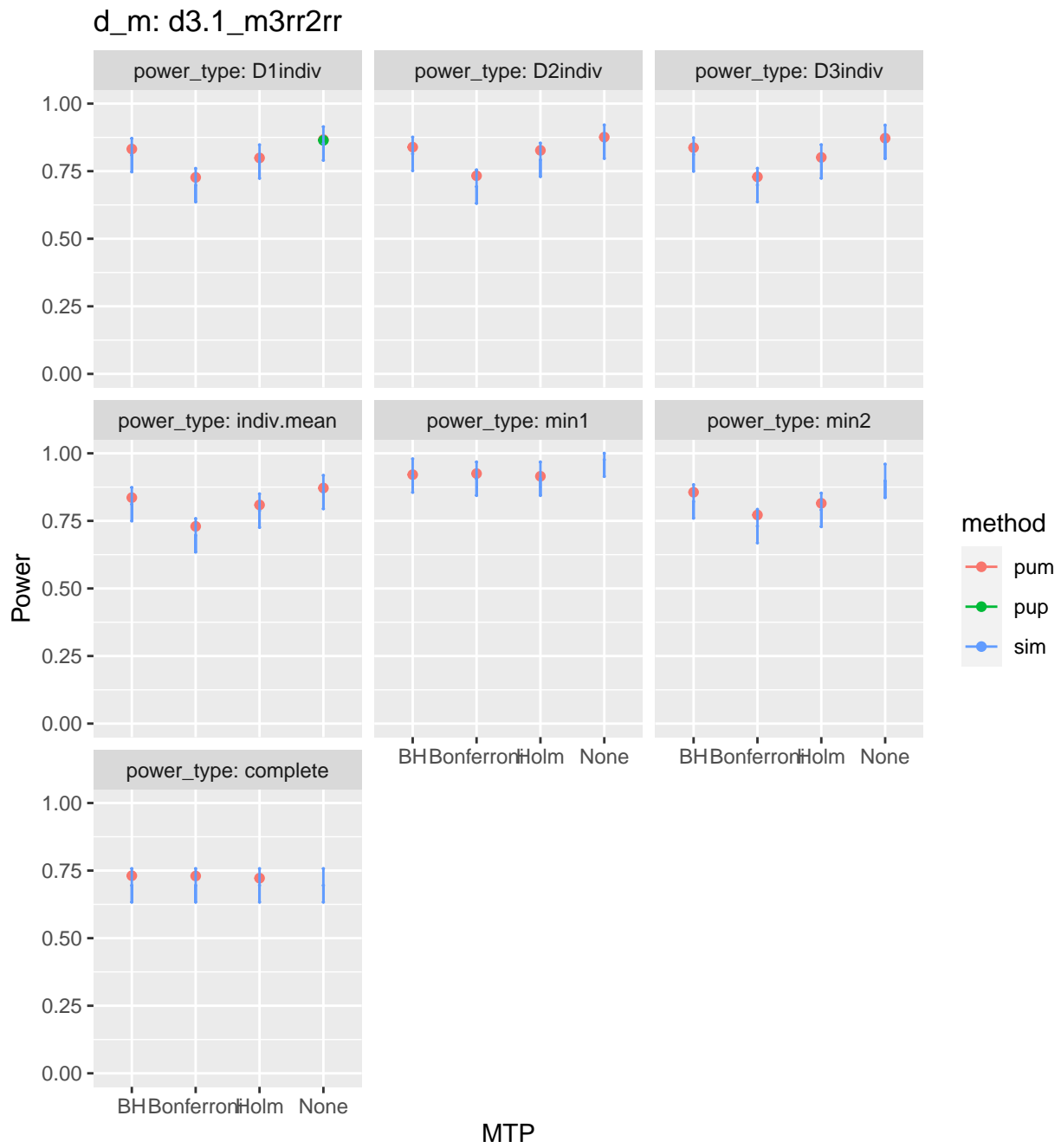
Design: Blocked RCT, with 3 levels, and randomization done at level 1 (individual level).

Models: random treatment effects.

- $M = 3$
- $J = 30$
- $K = 15$
- $\bar{n} = 100$ (unless otherwise noted)
- rho: $\rho = 0.5$
- MDES = 0.125, 0.125, 0.125
- R2: $R_1^2 = 0.1, 0.1, 0.1$
- ICC: $ICC_2 = 0.2, 0.2, 0.2$, $ICC_3 = 0.2, 0.2, 0.2$
- Omega: $\omega_2 = 0.1, 0.1, 0.1$, $\omega_3 = 0.1, 0.1, 0.1$

Power Validation

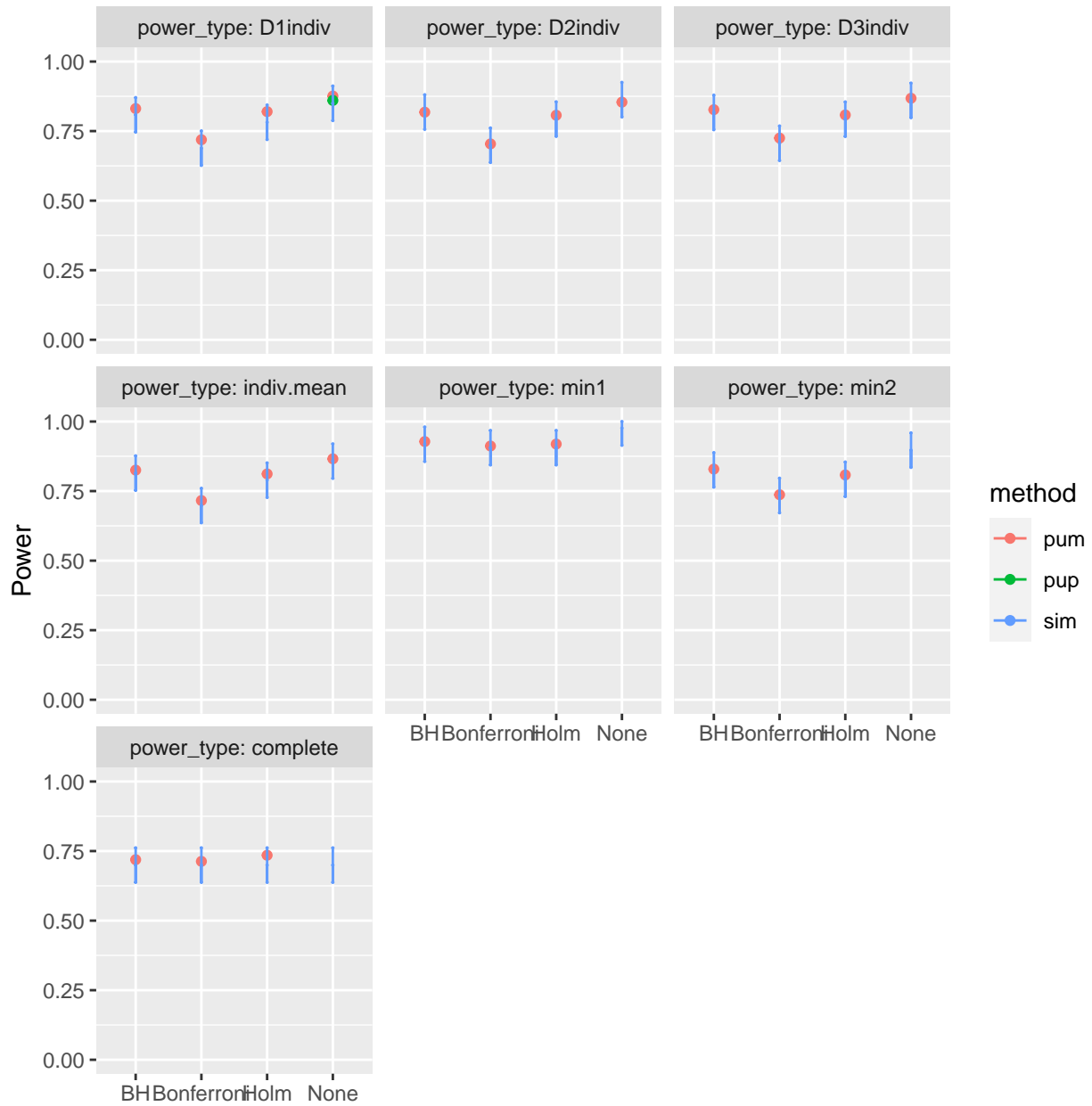
Base case



Varying school size

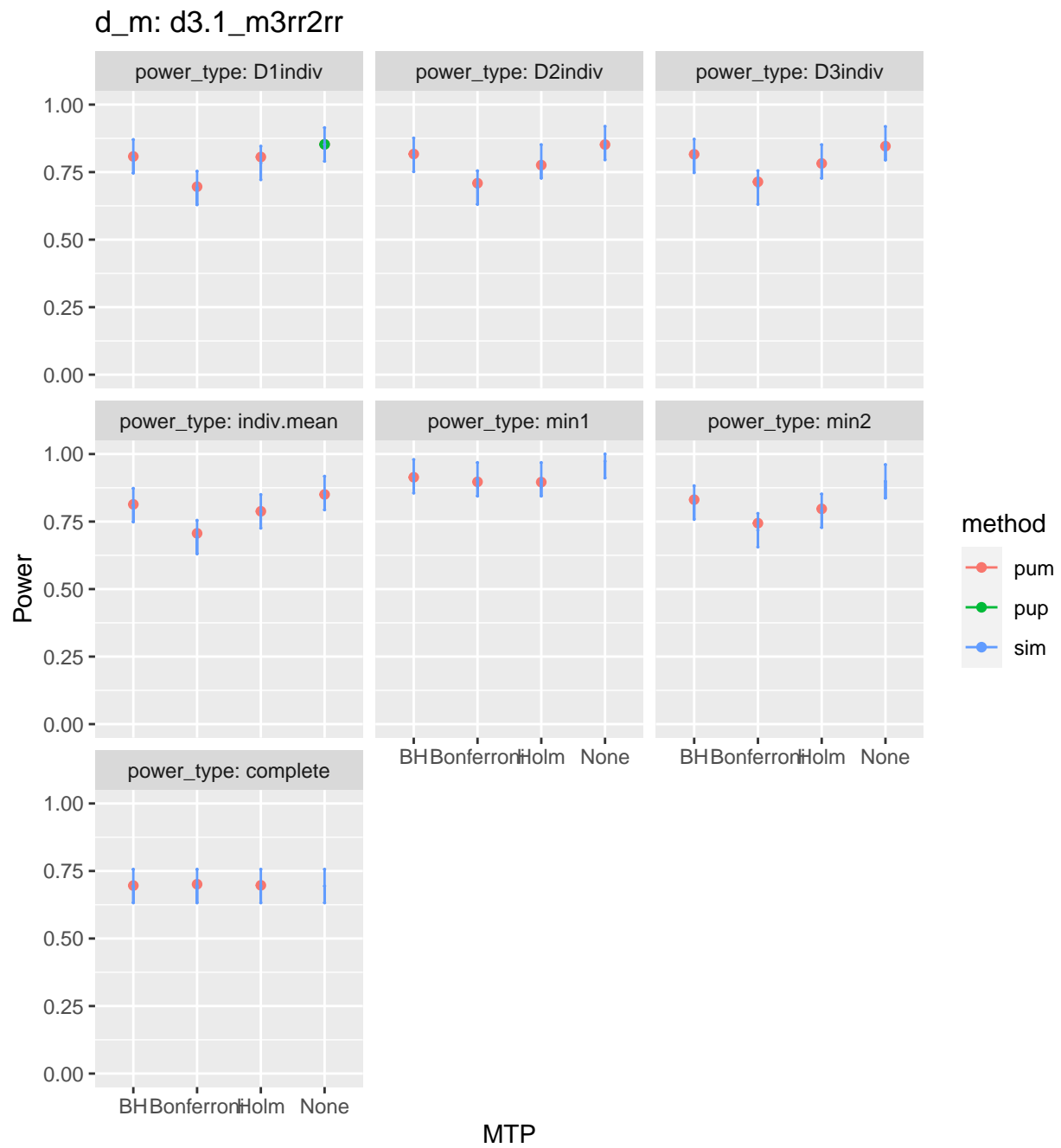
$\bar{n} = 75$

d_m: d3.1_m3rr2rr



MTP

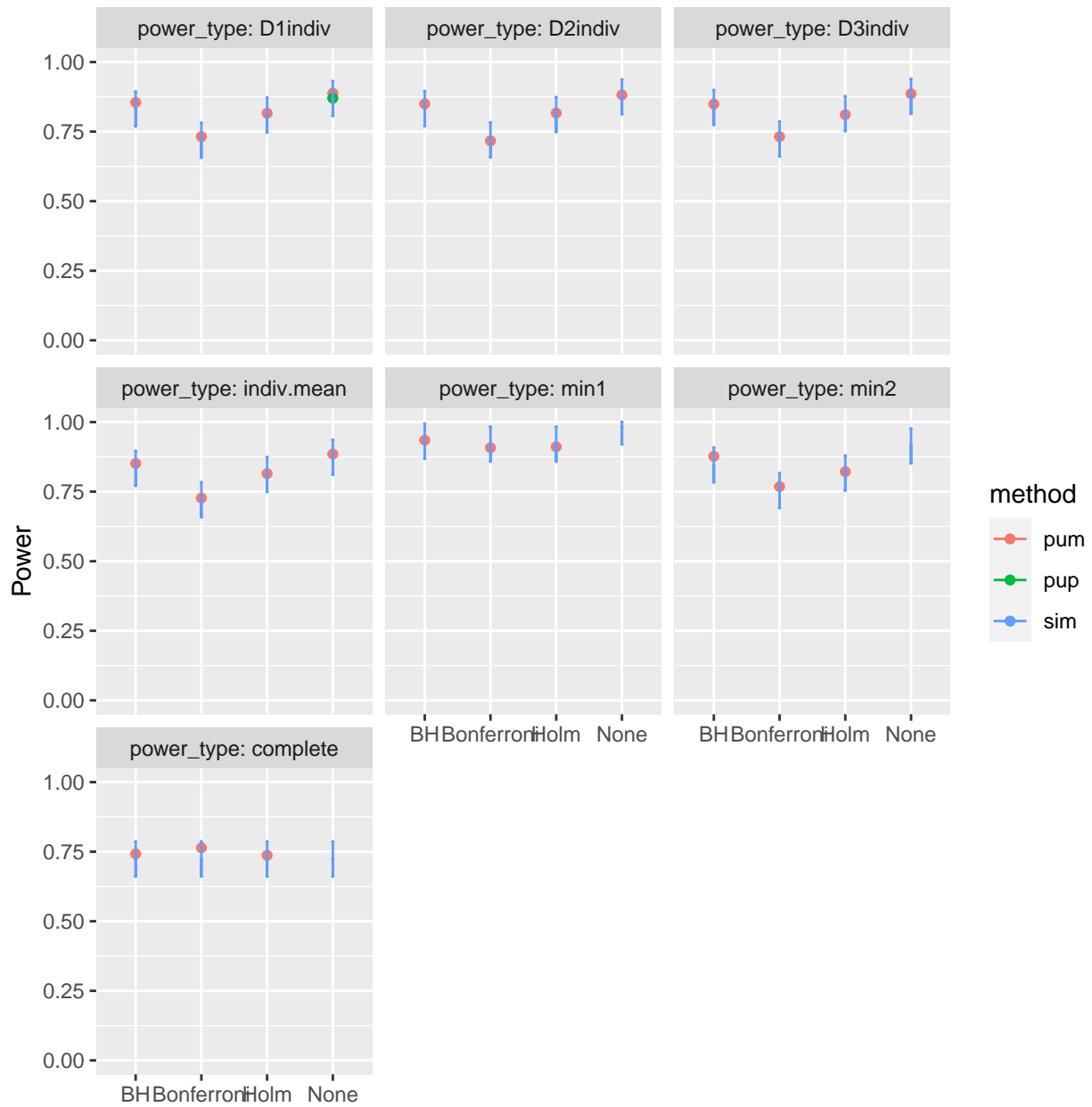
$\bar{n} = 50$



Varying R2

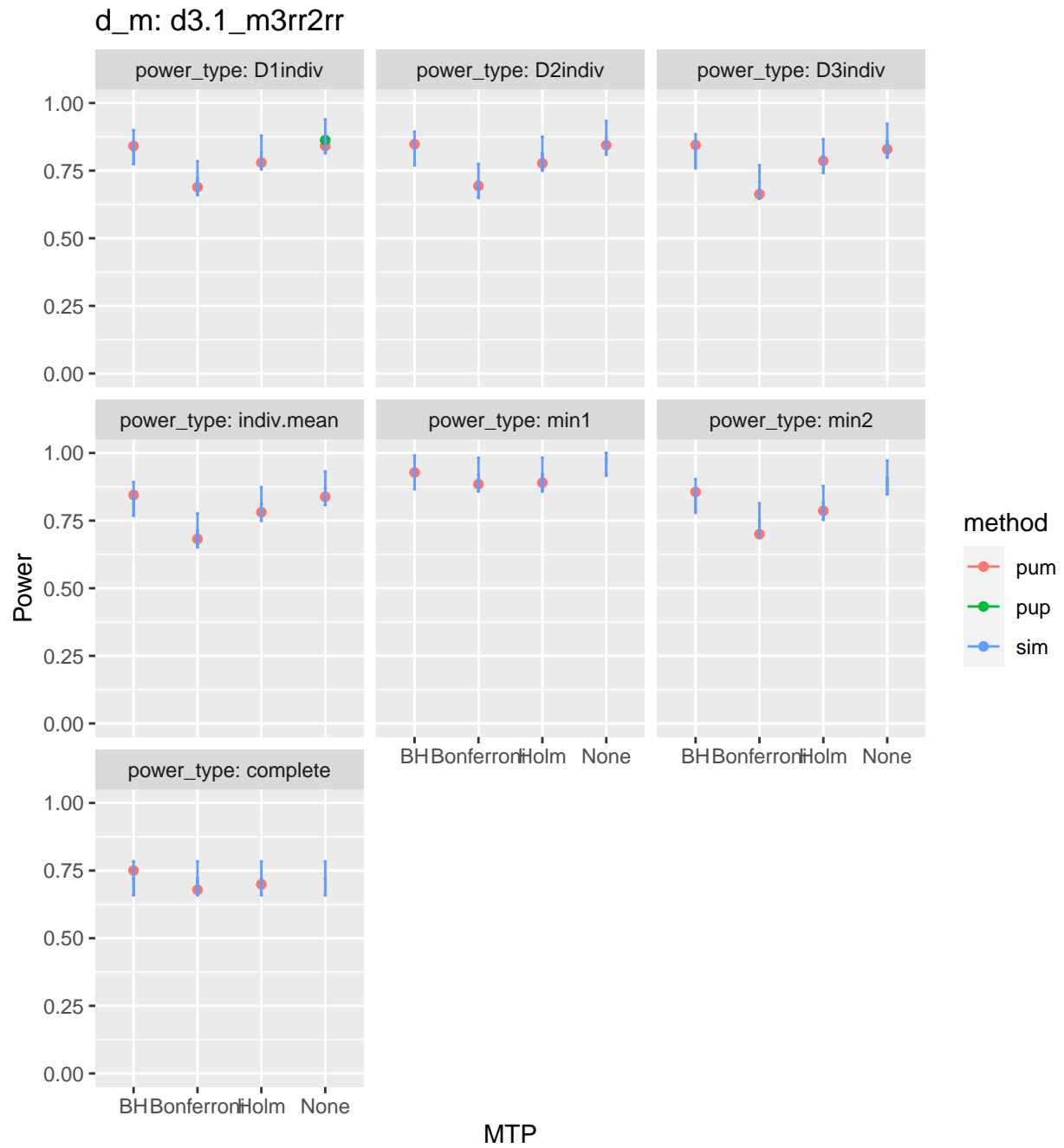
$$R_1^2 = 0.6, 0.6, 0.6$$

d_m: d3.1_m3rr2rr



MTP

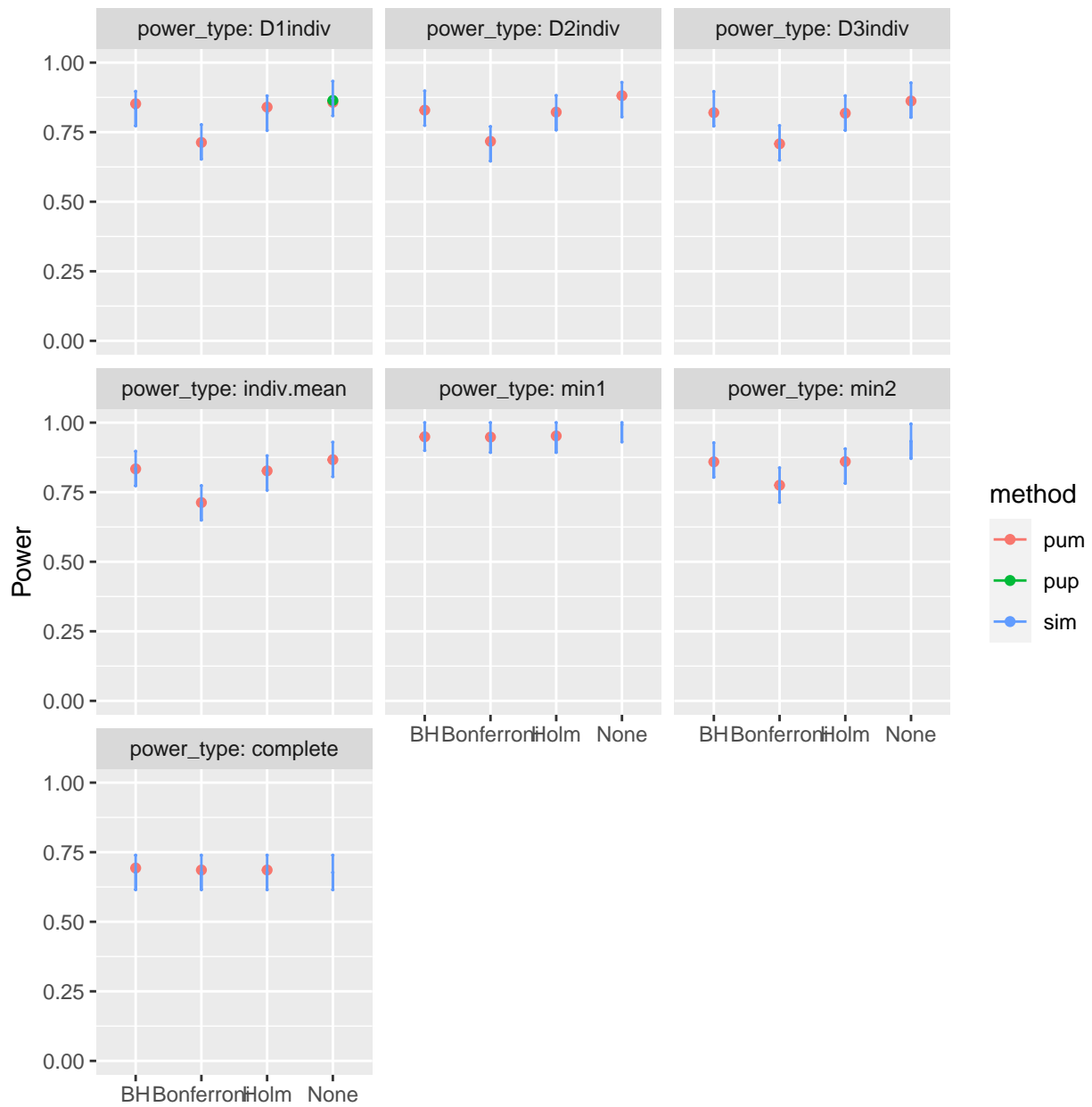
$$R_1^2 = 0, 0, 0$$



Varying rho

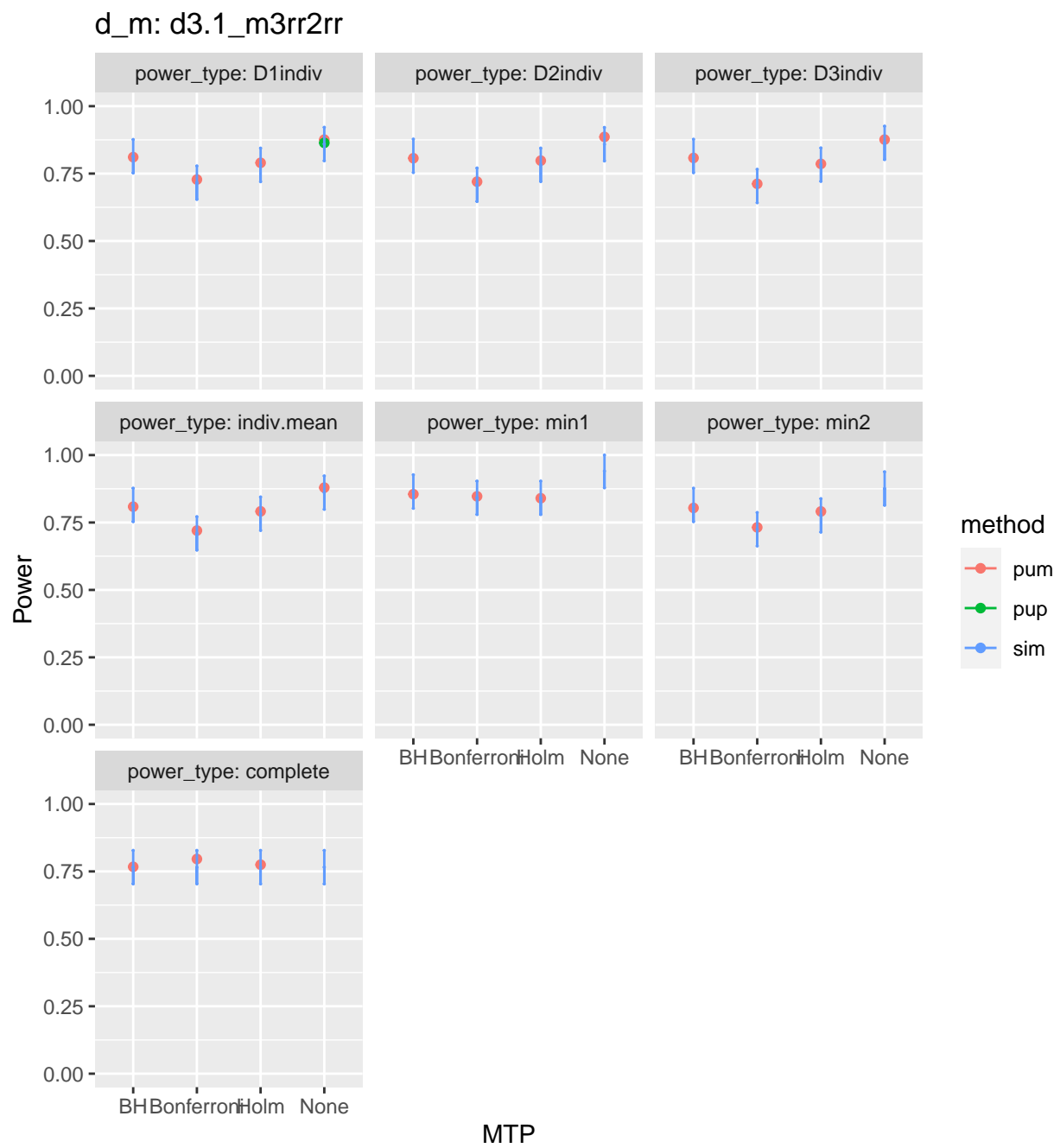
$\rho = 0.2$

d_m: d3.1_m3rr2rr



MTP

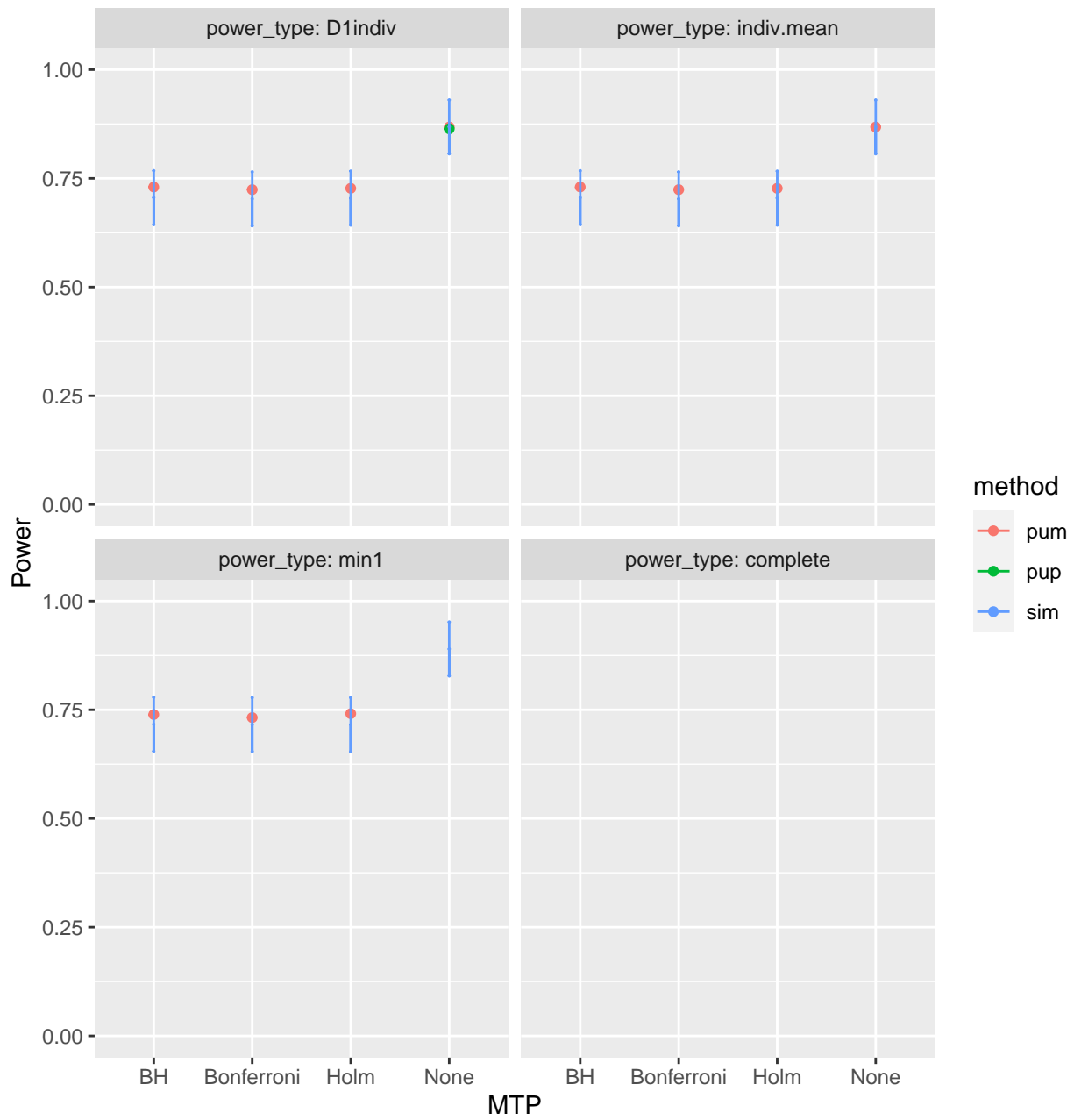
$\rho = 0.8$



Varying true positives

MDES = 0.125, 0, 0

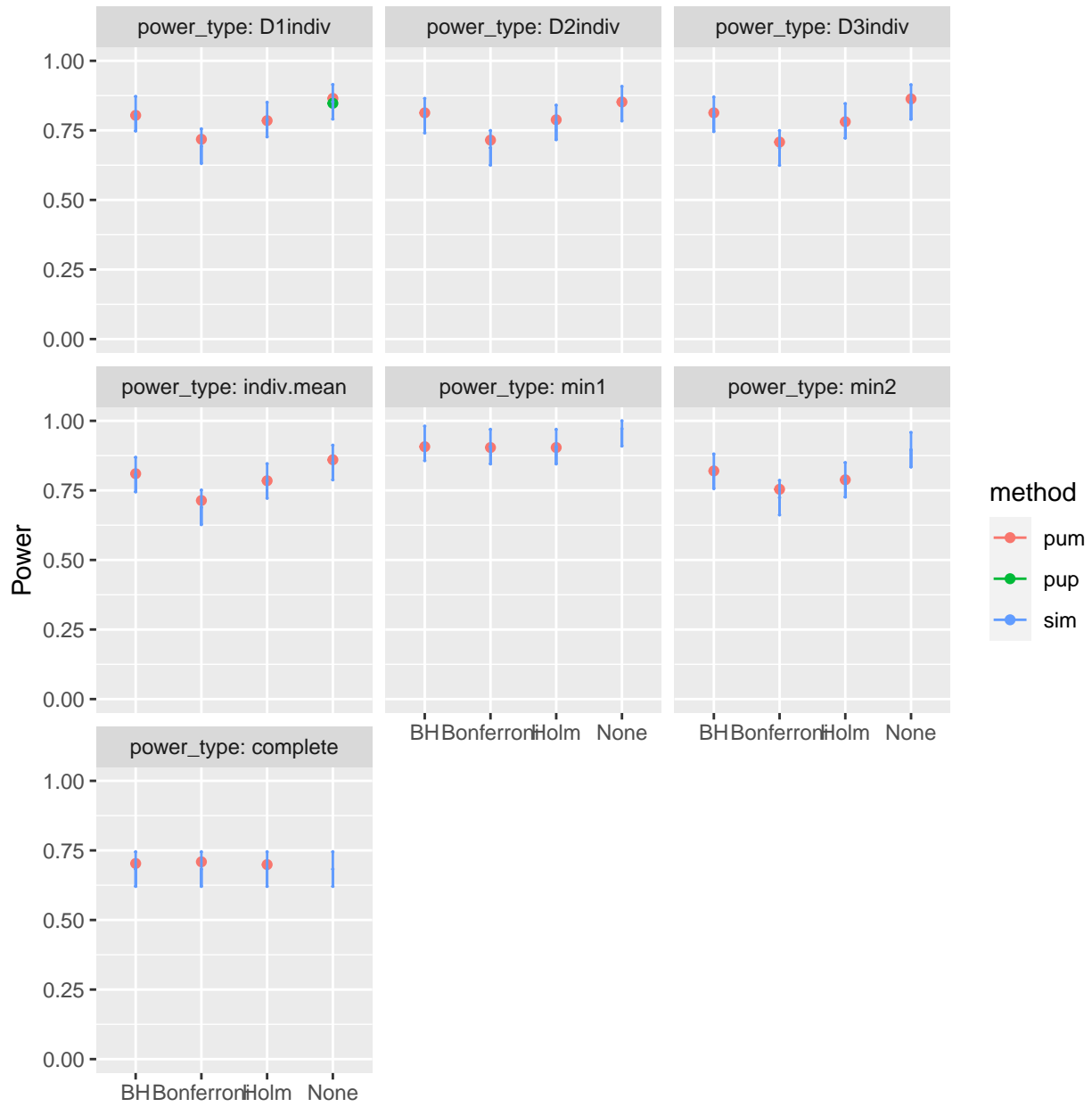
d_m: d3.1_m3rr2rr



Varying ICC

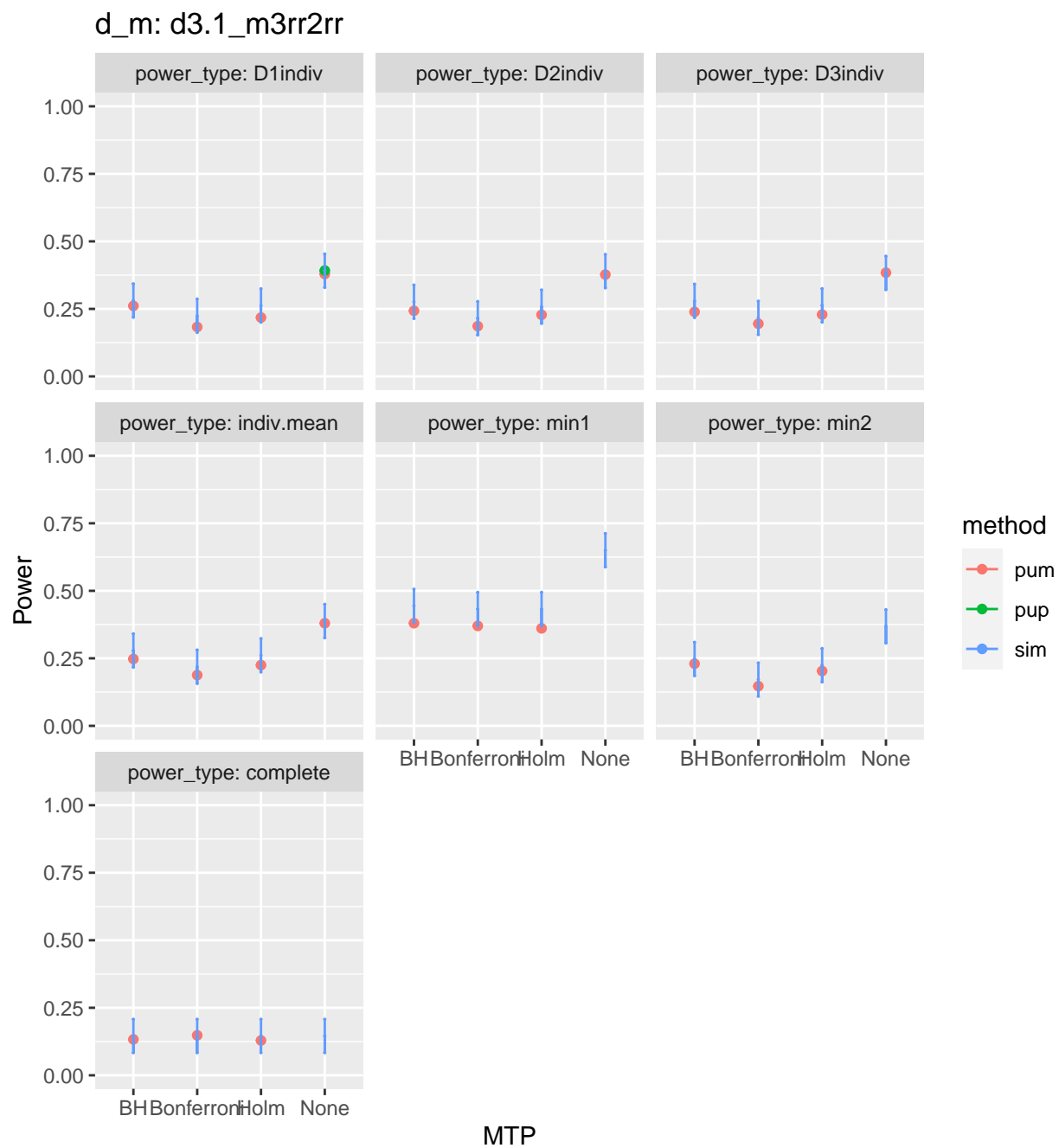
$ICC_2 = 0.7, 0.7, 0.7$

d_m: d3.1_m3rr2rr

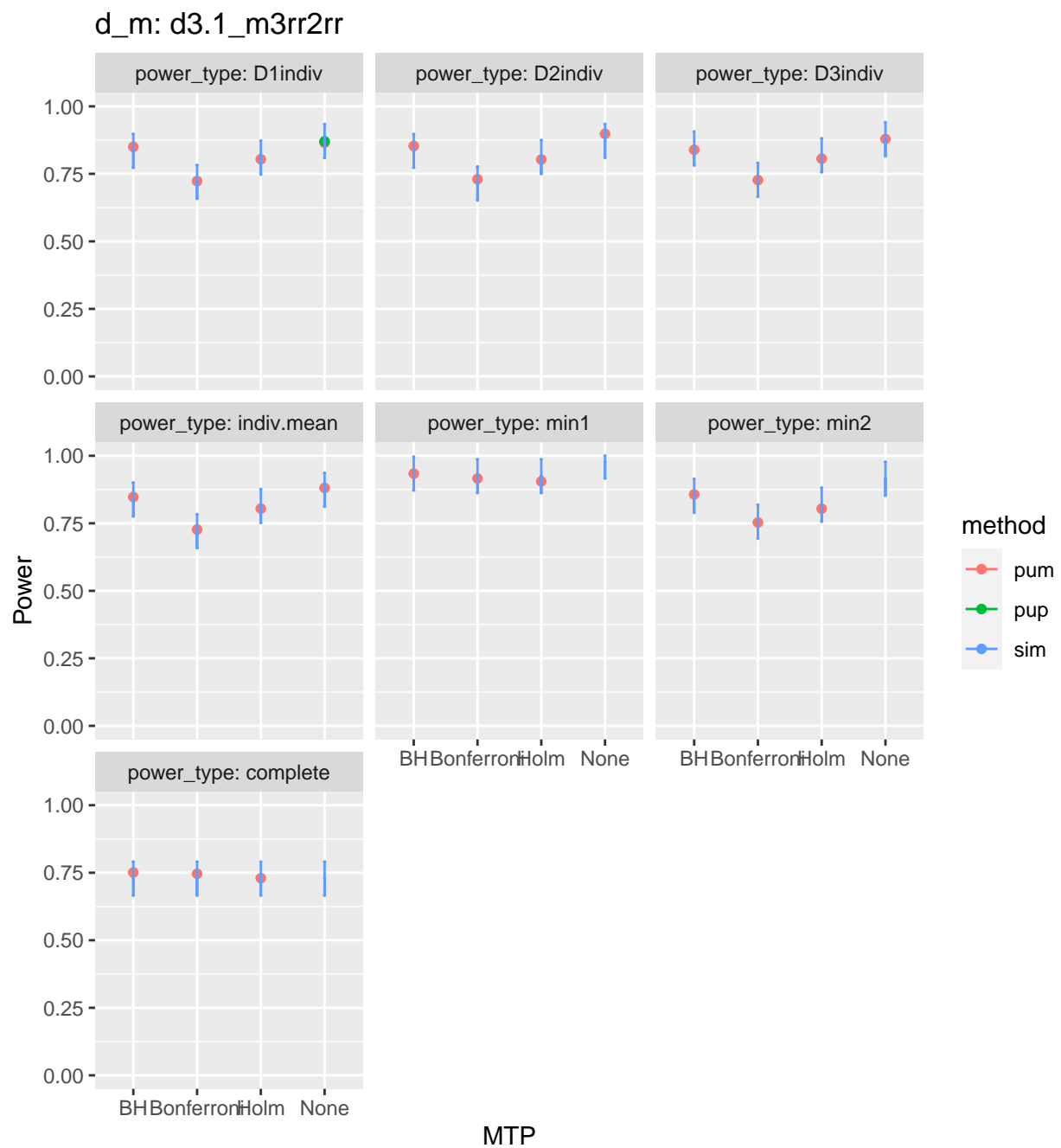


MTP

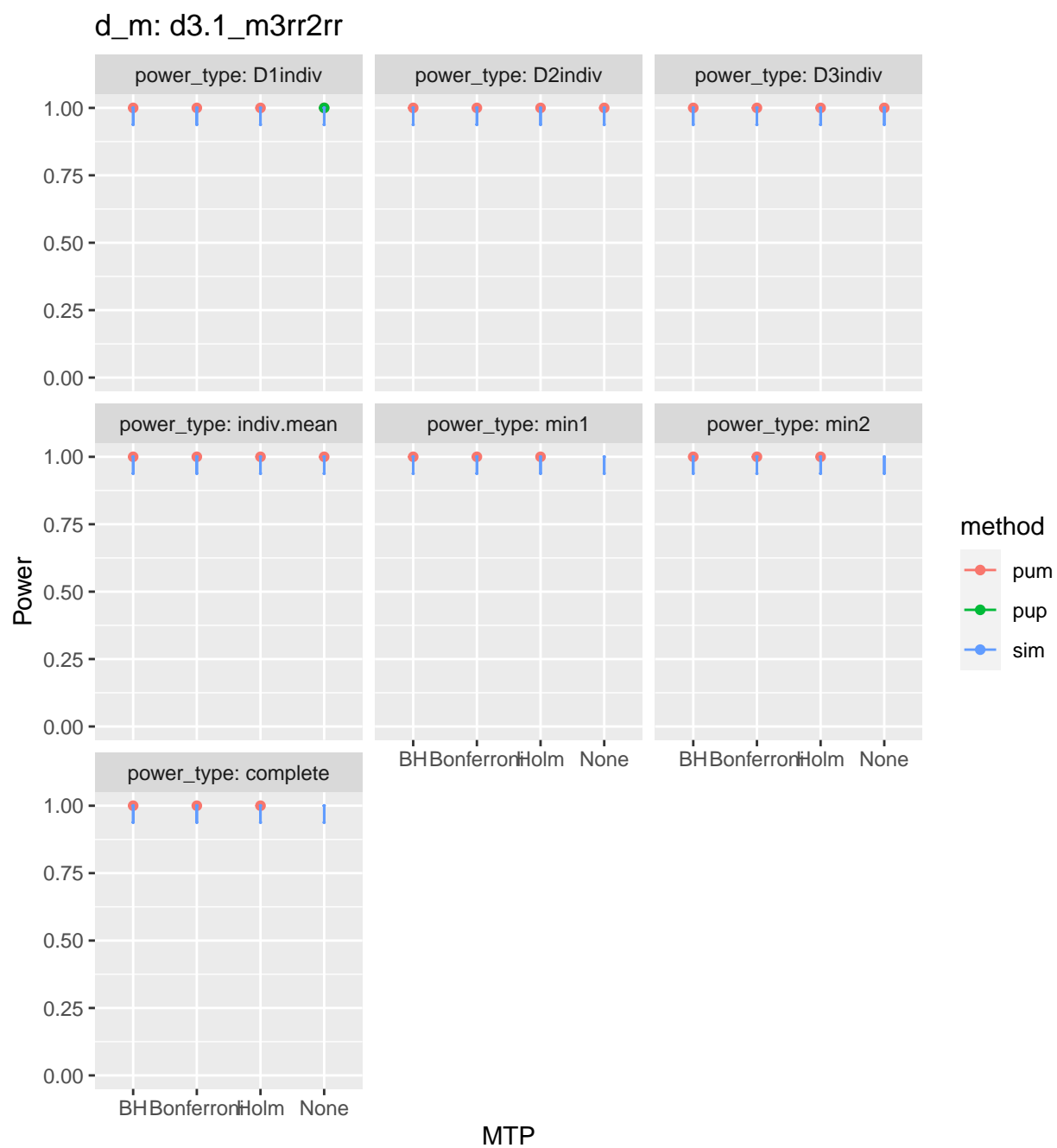
$ICC_3 = 0.7, 0.7, 0.7$



ICC₂ = 0, 0, 0



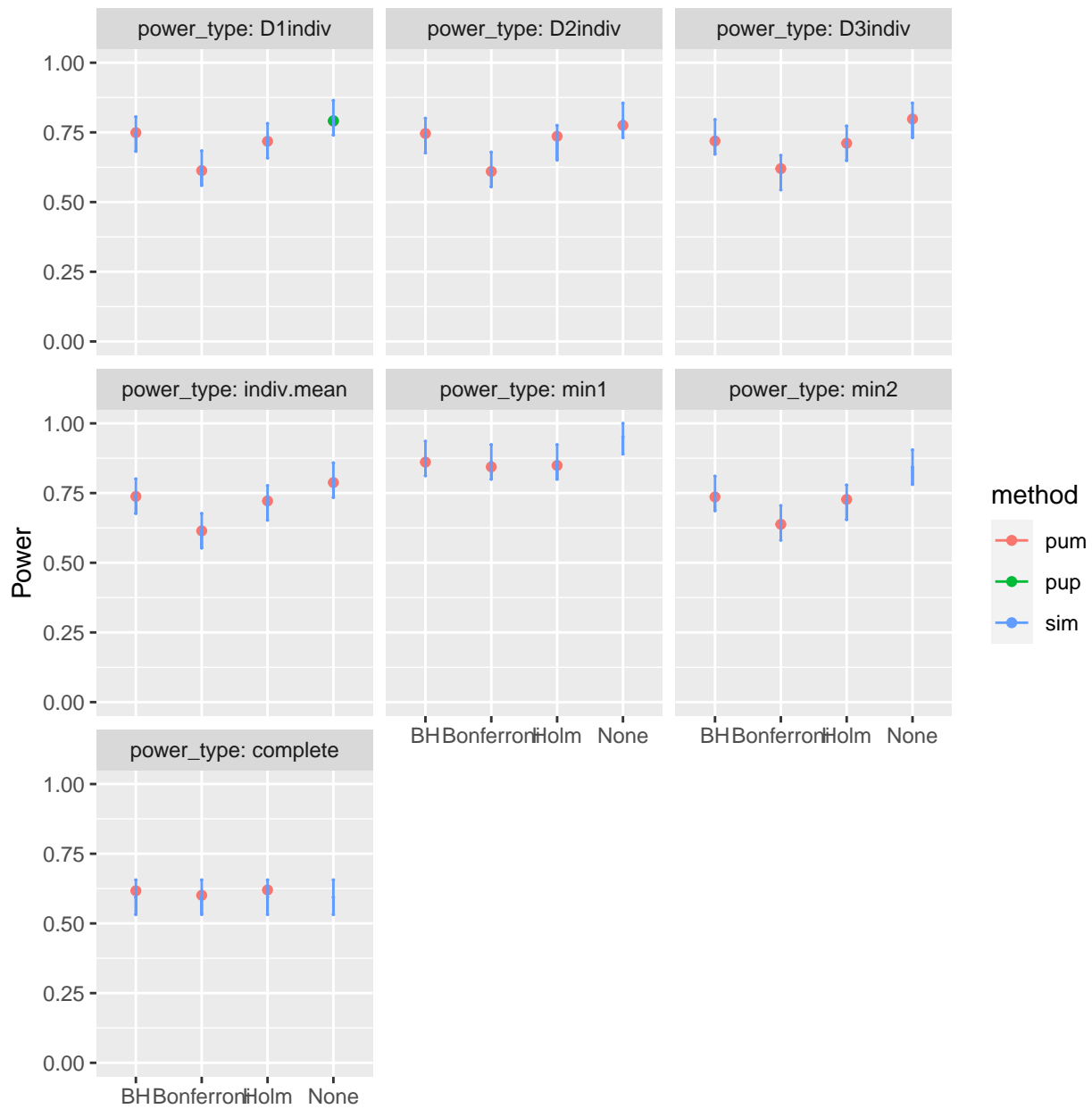
$ICC_2 = 0.2, 0.2, 0.2$



Varying Omega

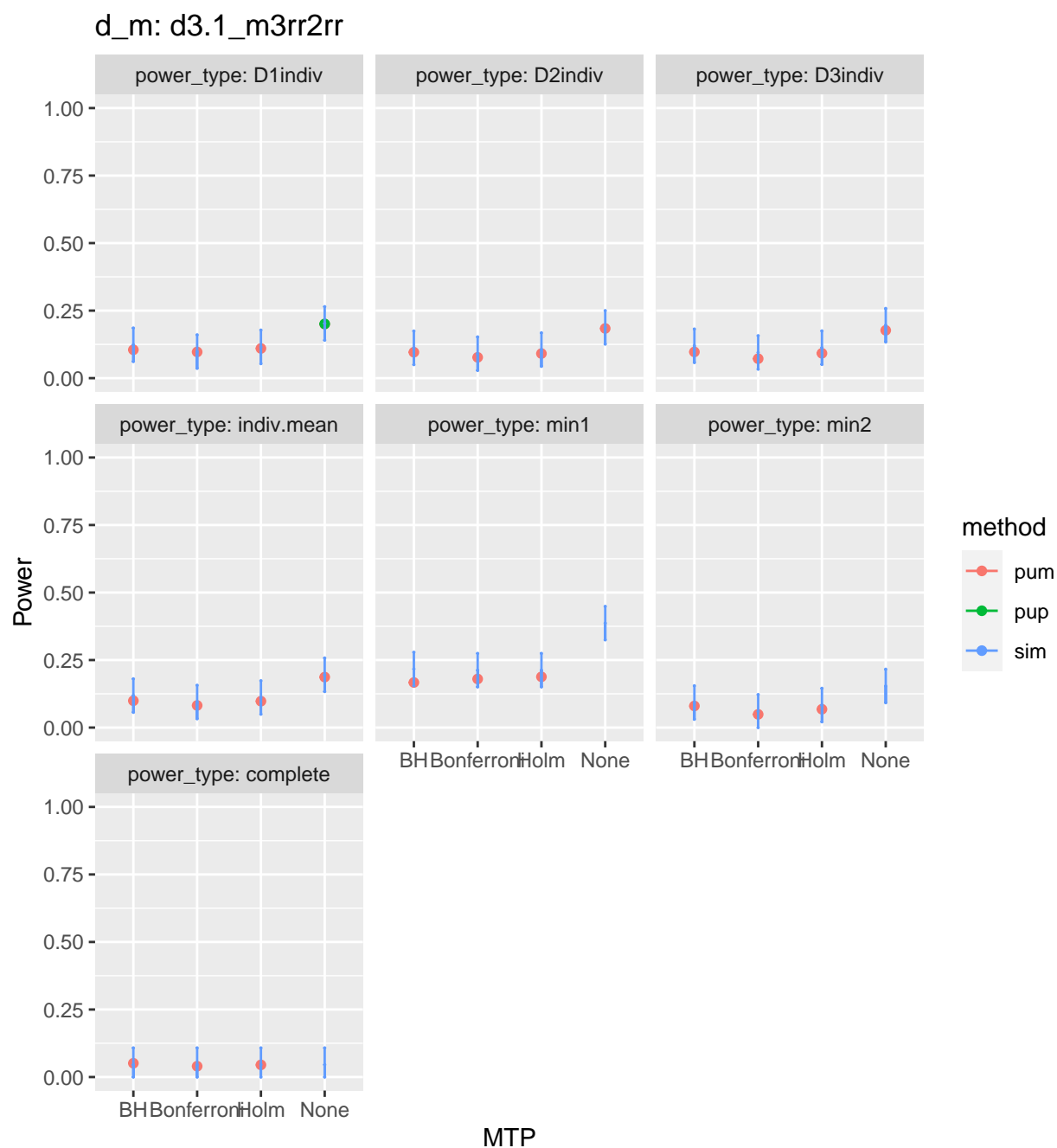
$\omega_2 = 0.8, 0.8, 0.8, \omega_3 = 0.1, 0.1, 0.1$

d_m: d3.1_m3rr2rr

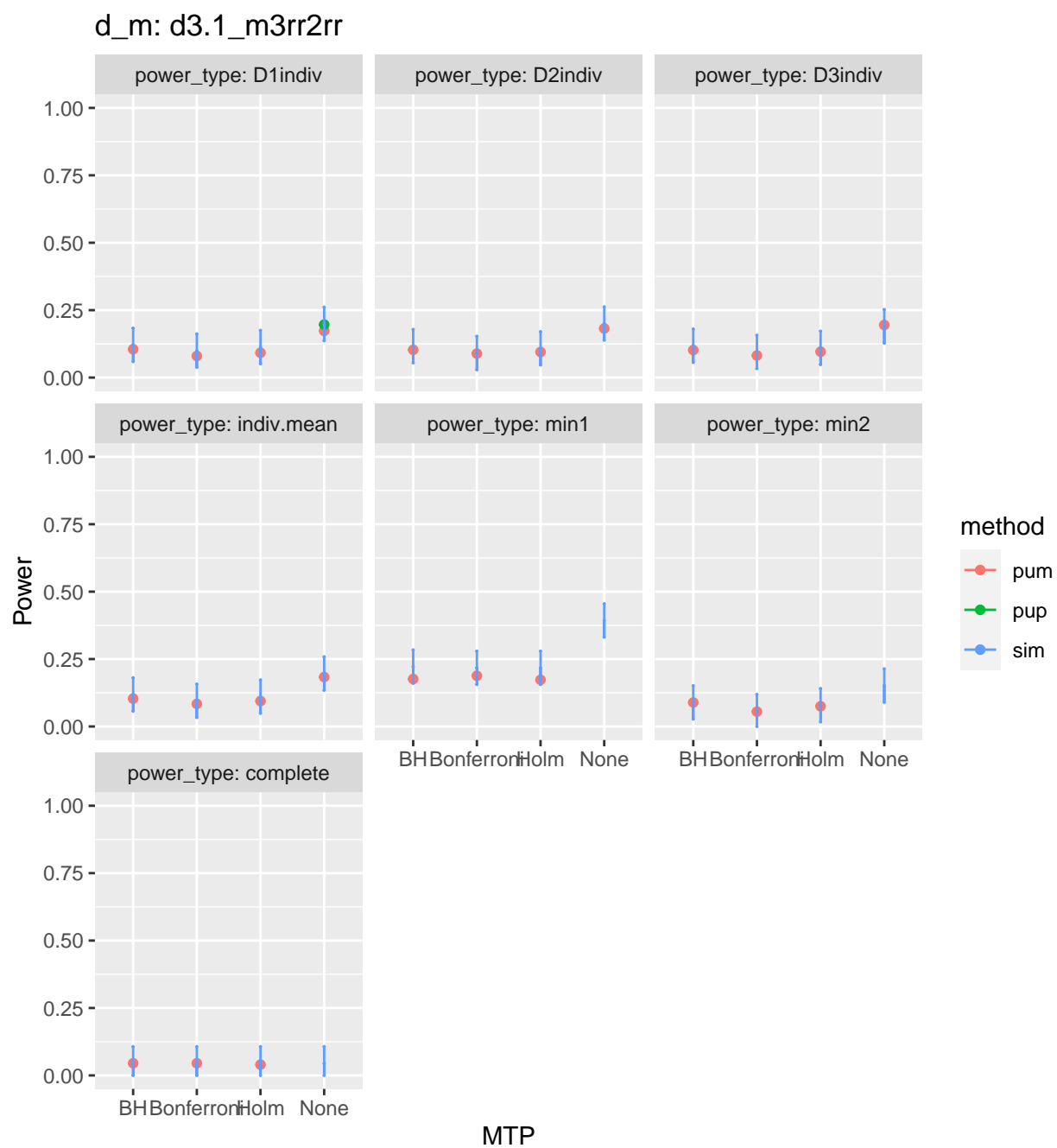


MTP

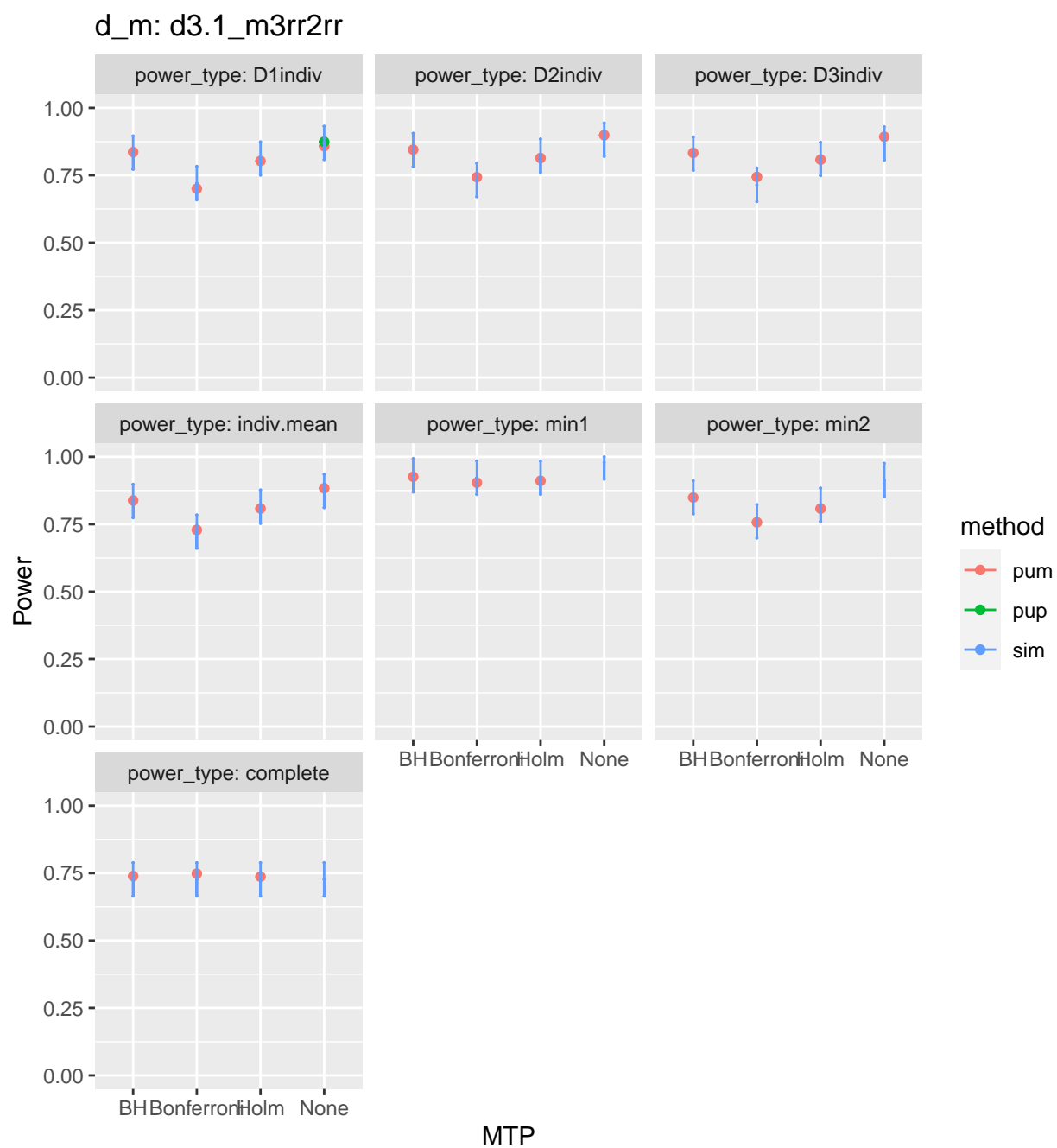
$\omega_2 = 0.1, 0.1, 0.1, \omega_3 = 0.8, 0.8, 0.8$



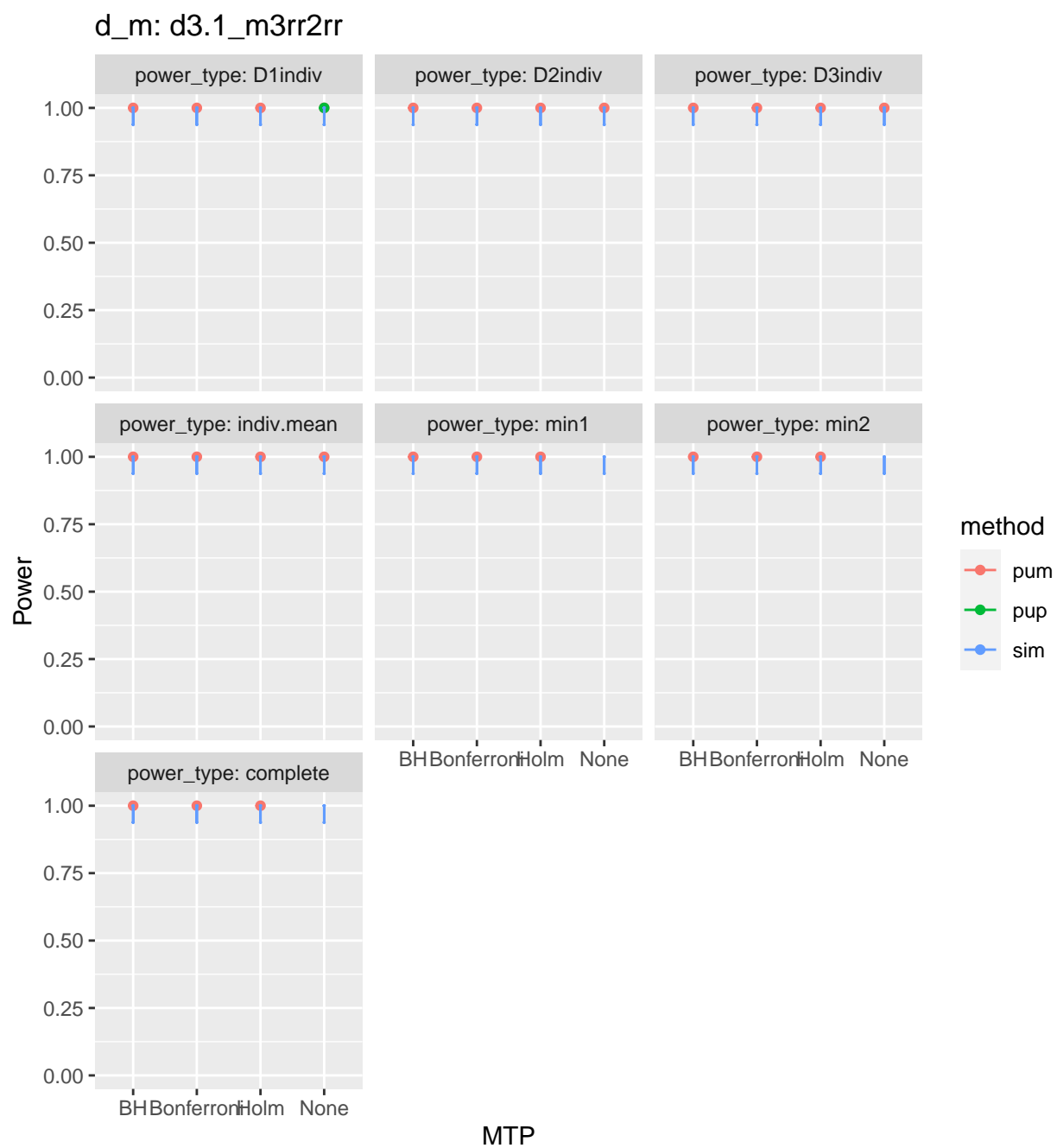
$\omega_2 = 0.8, 0.8, 0.8, \omega_3 = 0.8, 0.8, 0.8$



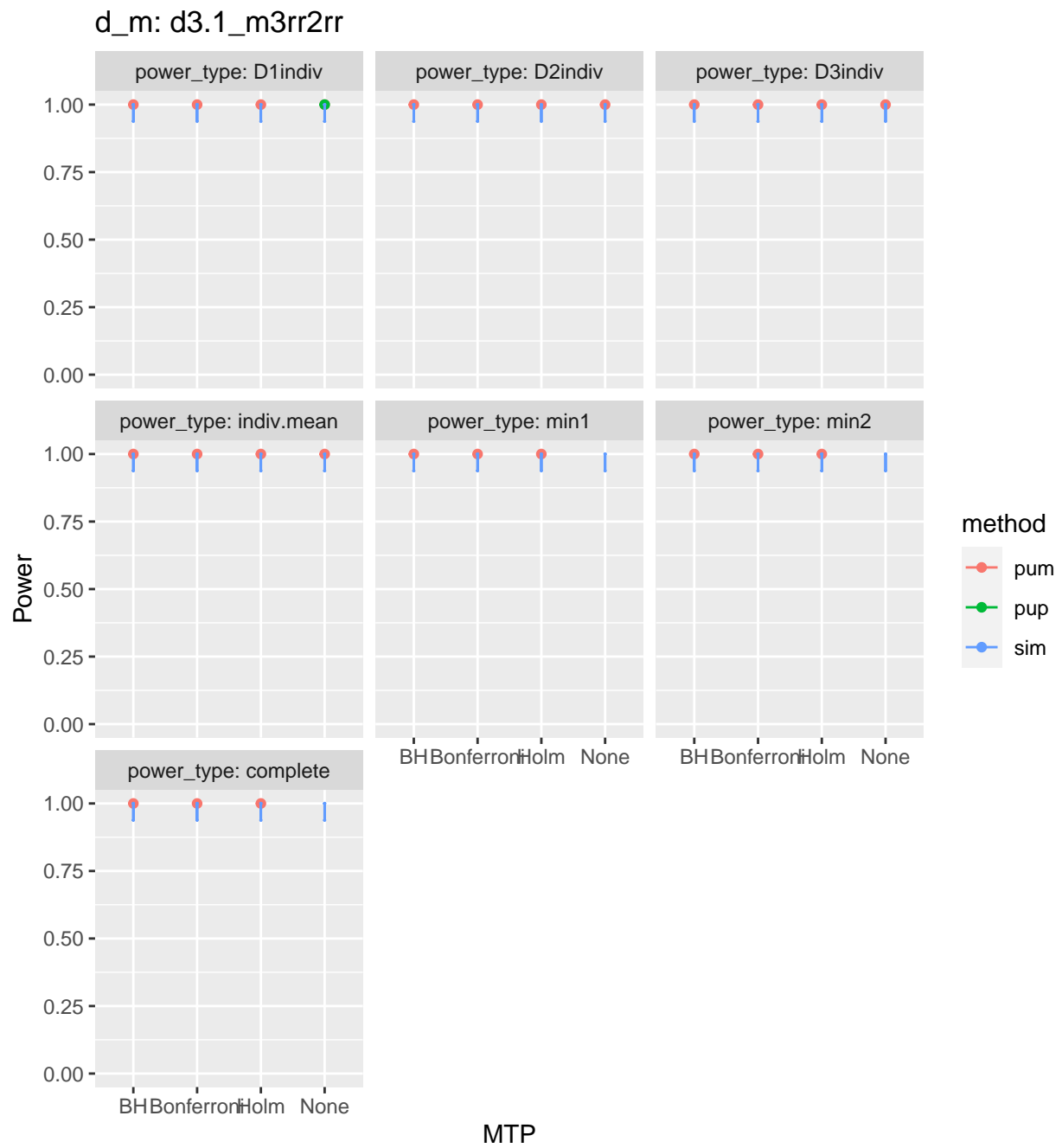
$\omega_2 = 0, 0, 0, \omega_3 = 0.1, 0.1, 0.1$



$\omega_2 = 0.1, 0.1, 0.1, \omega_3 = 0, 0, 0$



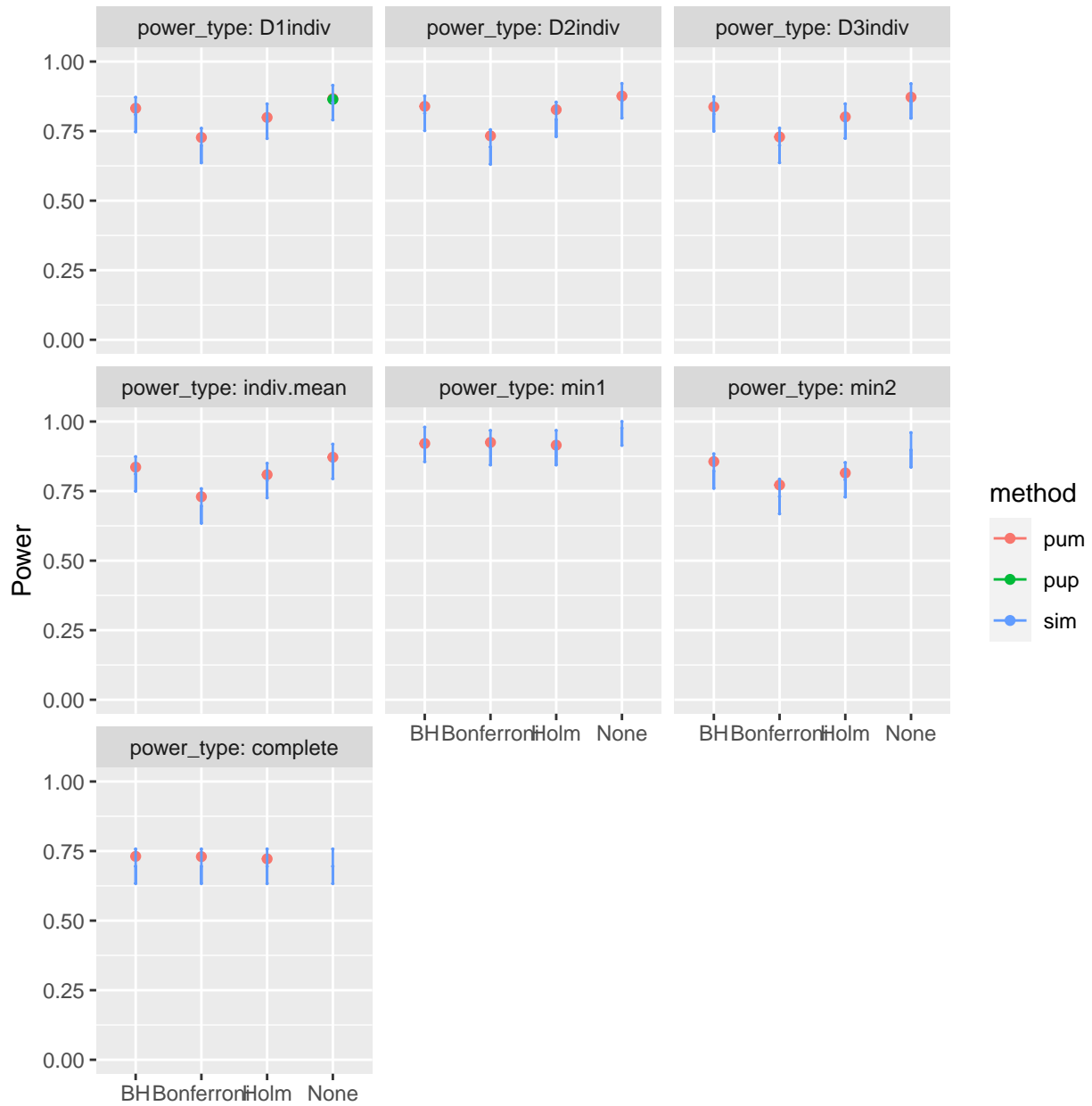
$\omega_2 = 0, 0, 0, \omega_3 = 0, 0, 0$



Kappa

$\kappa = 0.4$

d_m: d3.1_m3rr2rr



MTP

MDES validation

```
##
##
## +-----+-----+-----+-----+
## |      MTP      | Adjusted MDES | D1indiv Power | Target MDES |
## +=====+=====+=====+=====+
## | Bonferroni |      0.126      |      0.727      |      0.125      |
## +-----+-----+-----+-----+
## |      BH      |      0.124      |      0.826      |      0.125      |
## +-----+-----+-----+-----+
## |      Holm     |      0.123      |      0.796      |      0.125      |
## +-----+-----+-----+-----+
##
## Table: d3.1_m3rr2rr
```

Sample size validation

```
##
##
## +-----+-----+-----+-----+
## |      MTP      | Sample.type | Sample.size | D1indiv.power |
## +=====+=====+=====+=====+
## | Bonferroni |      J      |      39      |      0.727      |
## +-----+-----+-----+-----+
## |      BH      |      J      |      27      |      0.826      |
## +-----+-----+-----+-----+
## |      Holm     |      J      |      NA      |      NA          |
## +-----+-----+-----+-----+
##
## Table: d3.1_m3rr2rr
```

```
##
##
## +-----+-----+-----+-----+
## |      MTP      | Sample.type | Sample.size | D1indiv.power |
## +=====+=====+=====+=====+
## | Bonferroni |      K      |      15      |      0.727      |
## +-----+-----+-----+-----+
## |      BH      |      K      |      15      |      0.829      |
## +-----+-----+-----+-----+
## |      Holm     |      K      |      15      |      0.795      |
## +-----+-----+-----+-----+
##
## Table: d3.1_m3rr2rr
```

```
##
##
## +-----+-----+-----+-----+
## |      MTP      | Sample.type | Sample.size | D1indiv.power |
## +=====+=====+=====+=====+
## | Bonferroni |     nbar     |     186.2     |      0.727      |
## +-----+-----+-----+-----+
```

##		BH		nbar		1120		0.842	
##	+-----+-----+-----+-----+								
##		Holm		nbar		58		0.797	
##	+-----+-----+-----+-----+								
##									
## Table: d3.1_m3rr2rr									