Power Validation

MDES validation

Sample size validation

Validate Power: cluster_c3_3r

Code

Kristin Porter, Zarni Htet, Kristen Hunter

Design: Cluster RCT, with 3 levels, and randomization done at level 3 (district level).

Models: random treatment effects.

Power Validation

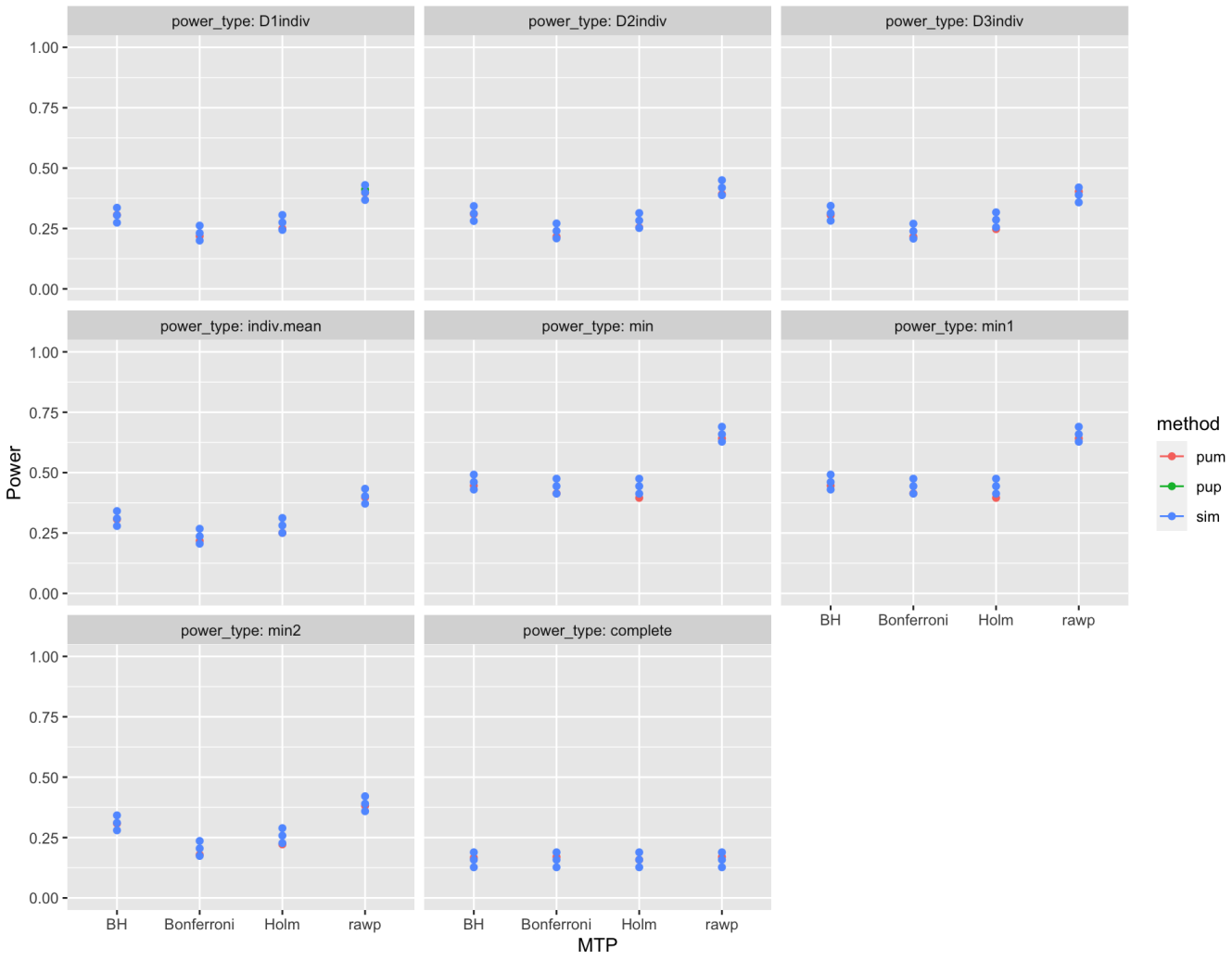
Default parameters:

- M = 3
- J = 40
- K = 20
- rho: ρ = 0.5
- ATE ES = 0.25, 0.25, 0.25
- R2: R_1^2 = 0.1, 0.1, 0.1, R_2^2 = 0.1, 0.1, 0.1, R_3^2 = 0.1, 0.1, 0.1
- ICC: ICC_2 = 0.1, 0.1, 0.1, ICC_3 = 0.1, 0.1, 0.1
- Omega: ω_2 = 0, ω_3 = 0

Varying school size

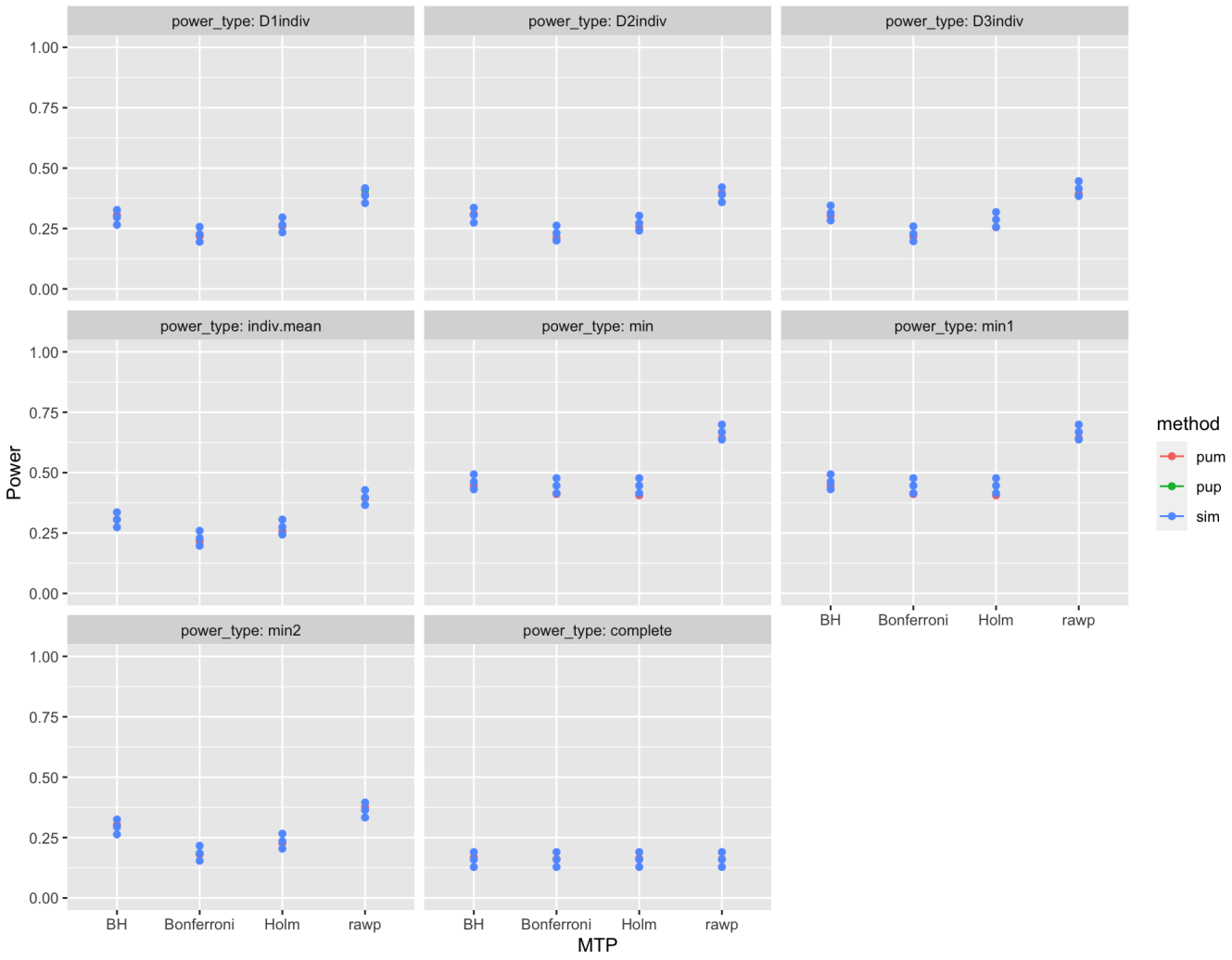
$\bar{n}$ = 100

Design: simple_c3_3r

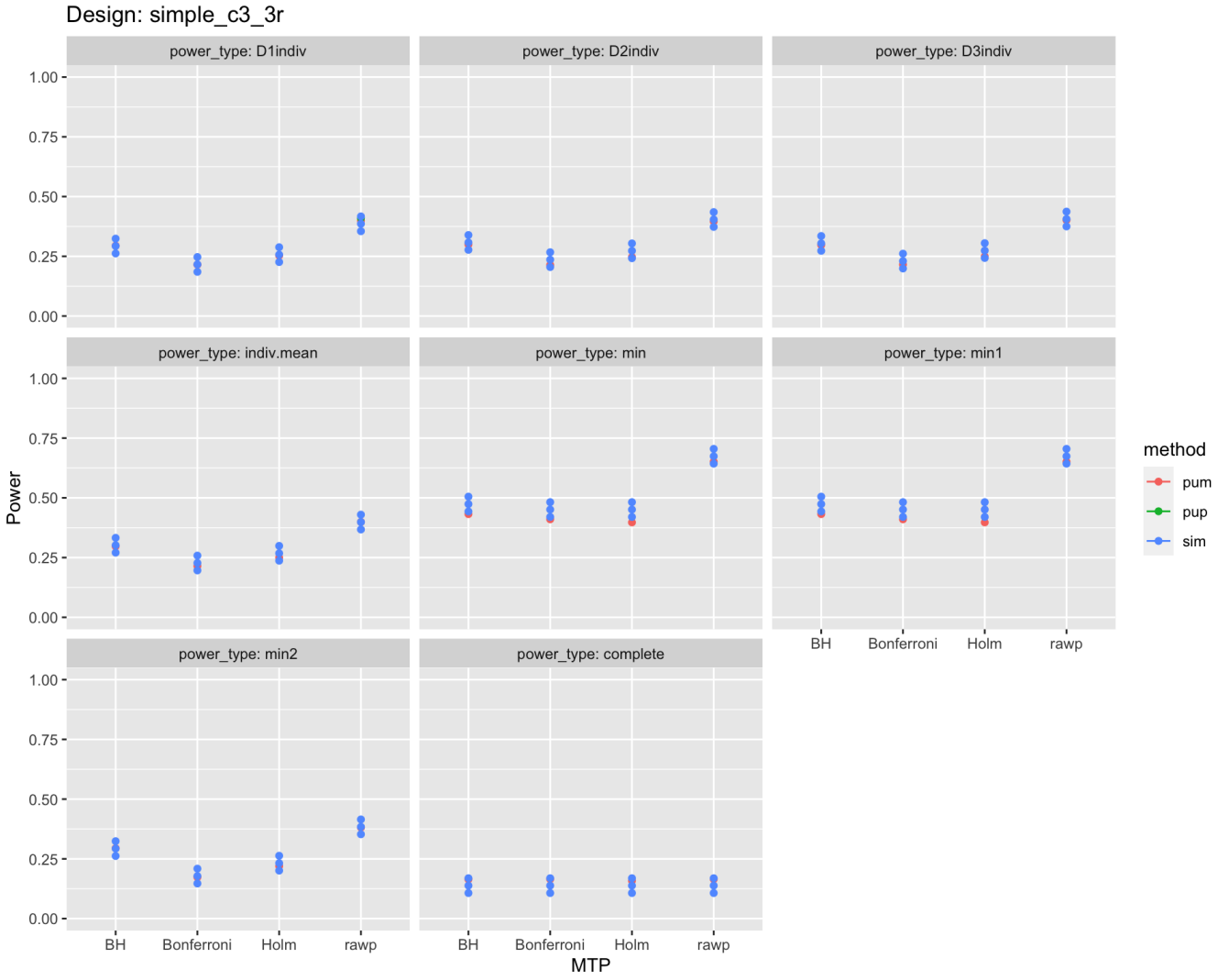


$\bar{n}$ = 75

Design: simple_c3_3r

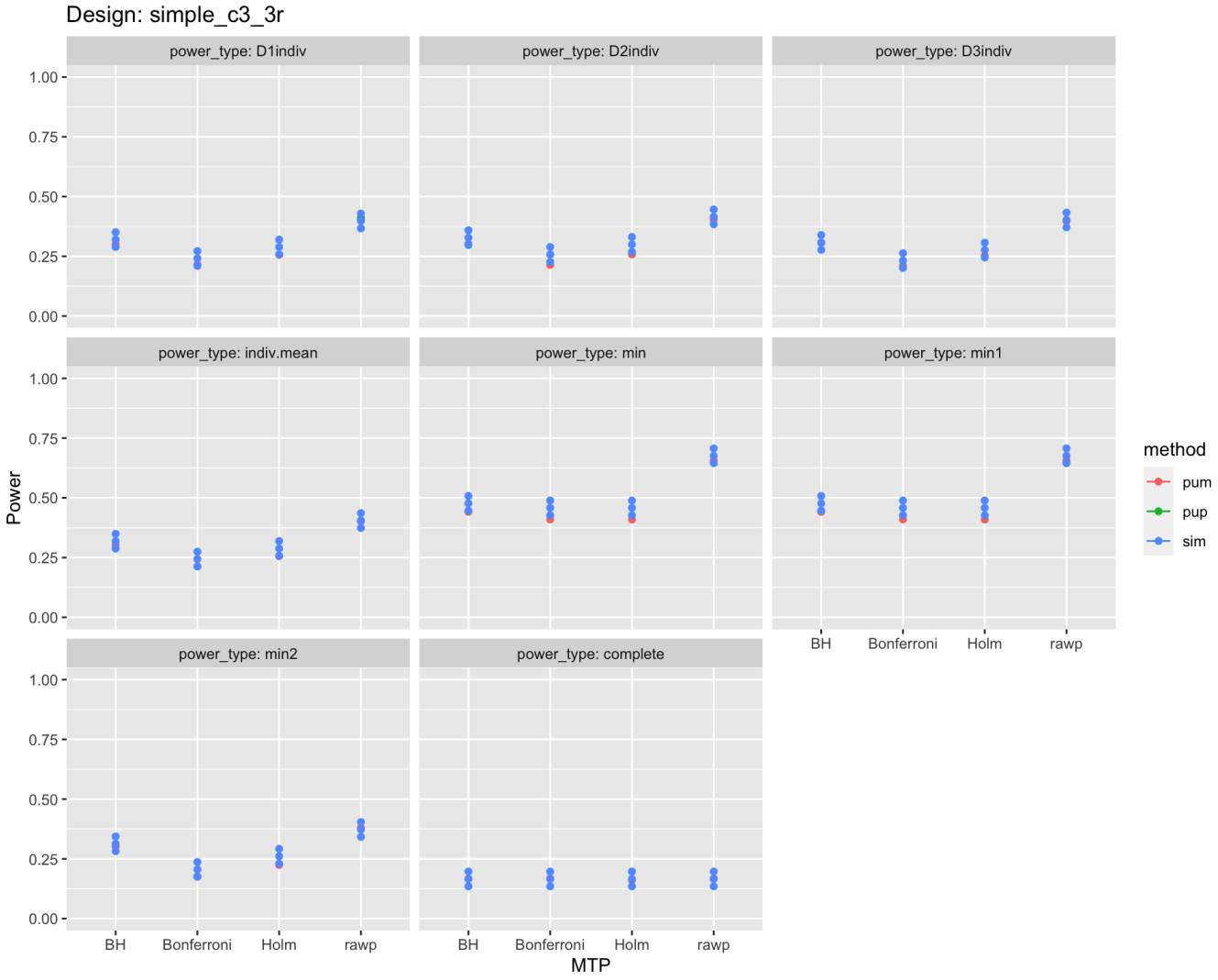


$\bar{n}$ = 50

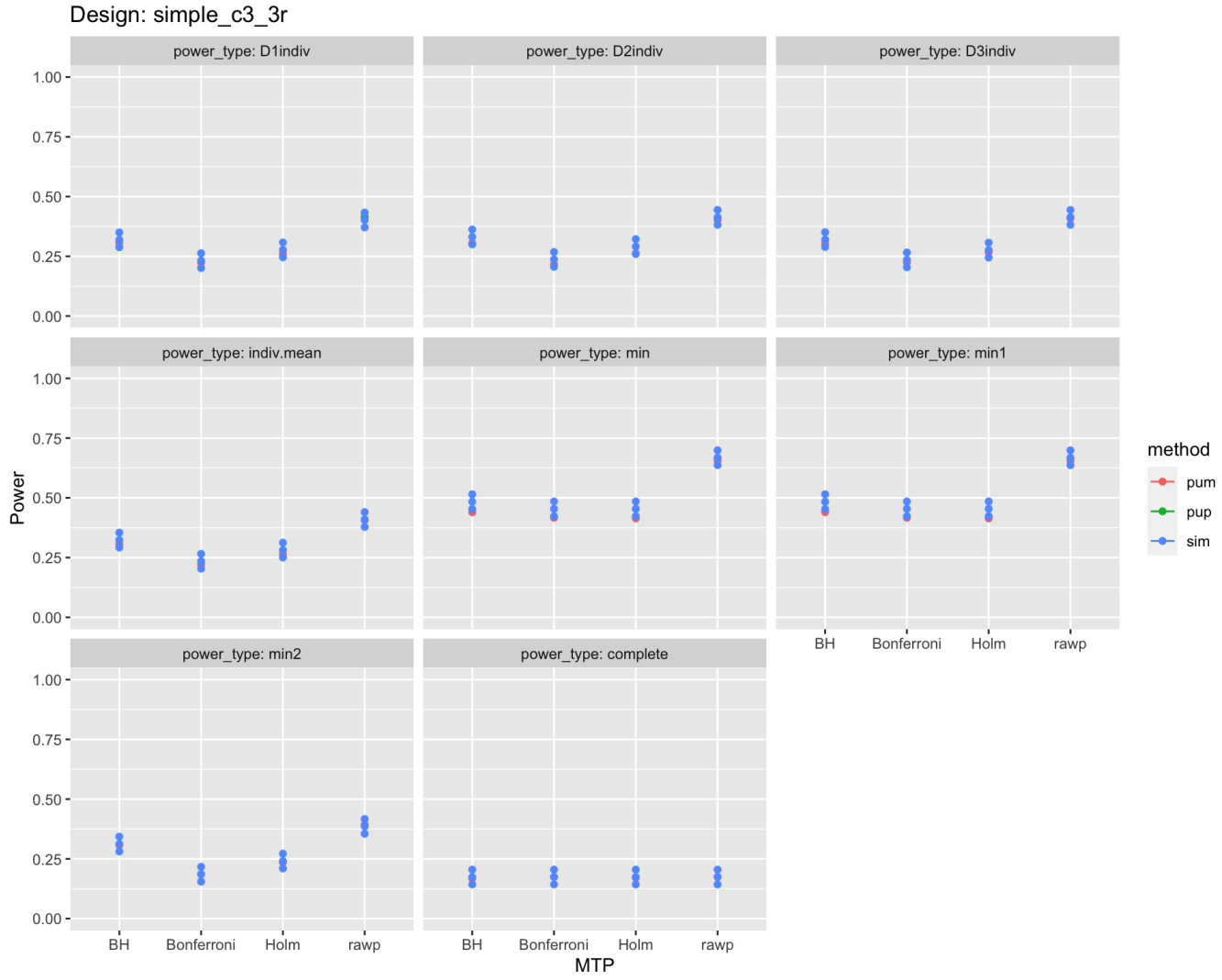


Varying R2

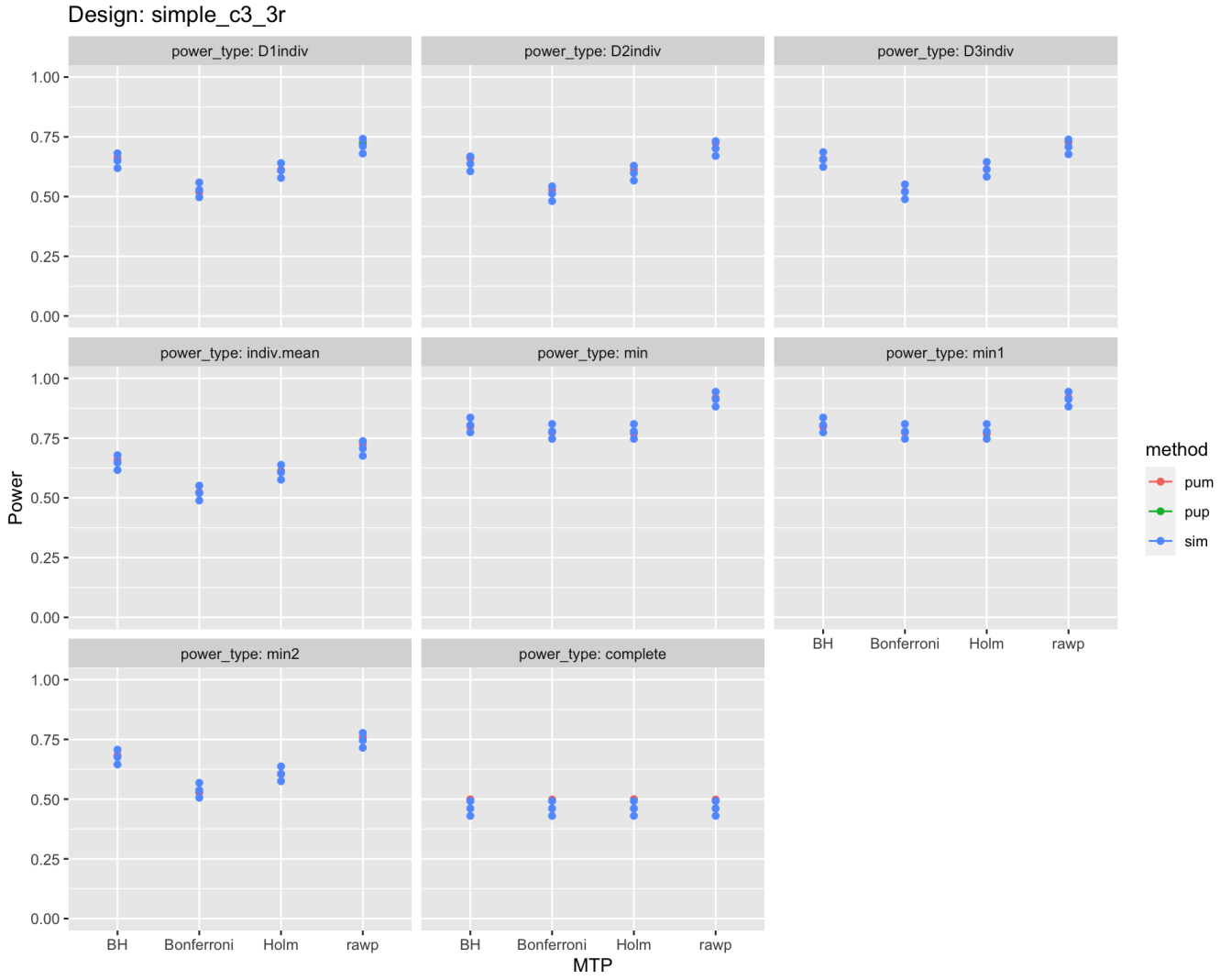
$R_1^2 = 0.6, 0.6, 0.6$


Design: simple_c3_3r
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
rawp
MTP
method
pum
pup
sim

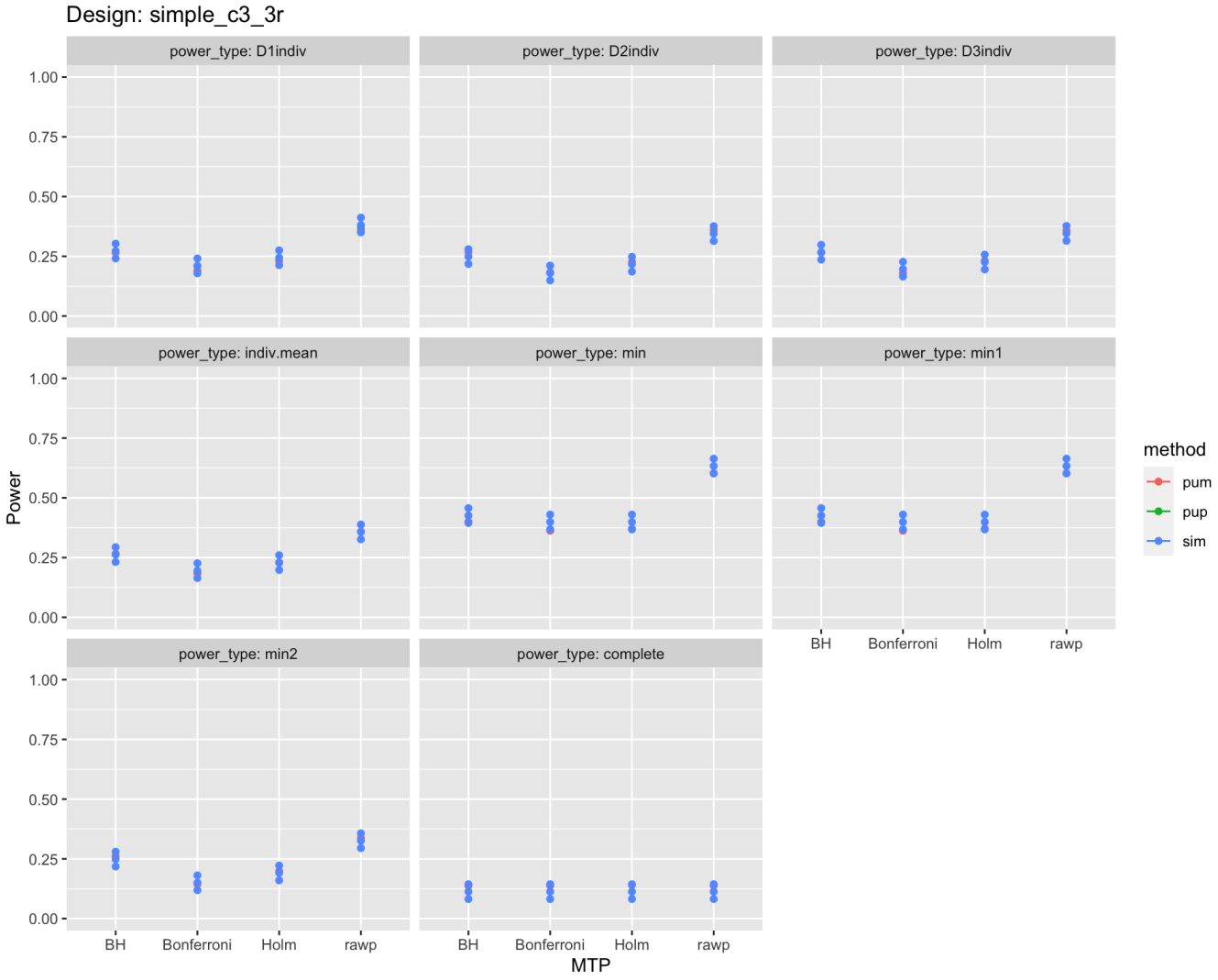
$R_2^2 = 0.6, 0.6, 0.6$


Design: simple_c3_3r
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
rawp
MTP
method
pum
pup
sim

$R_3^2 = 0.6, 0.6, 0.6$

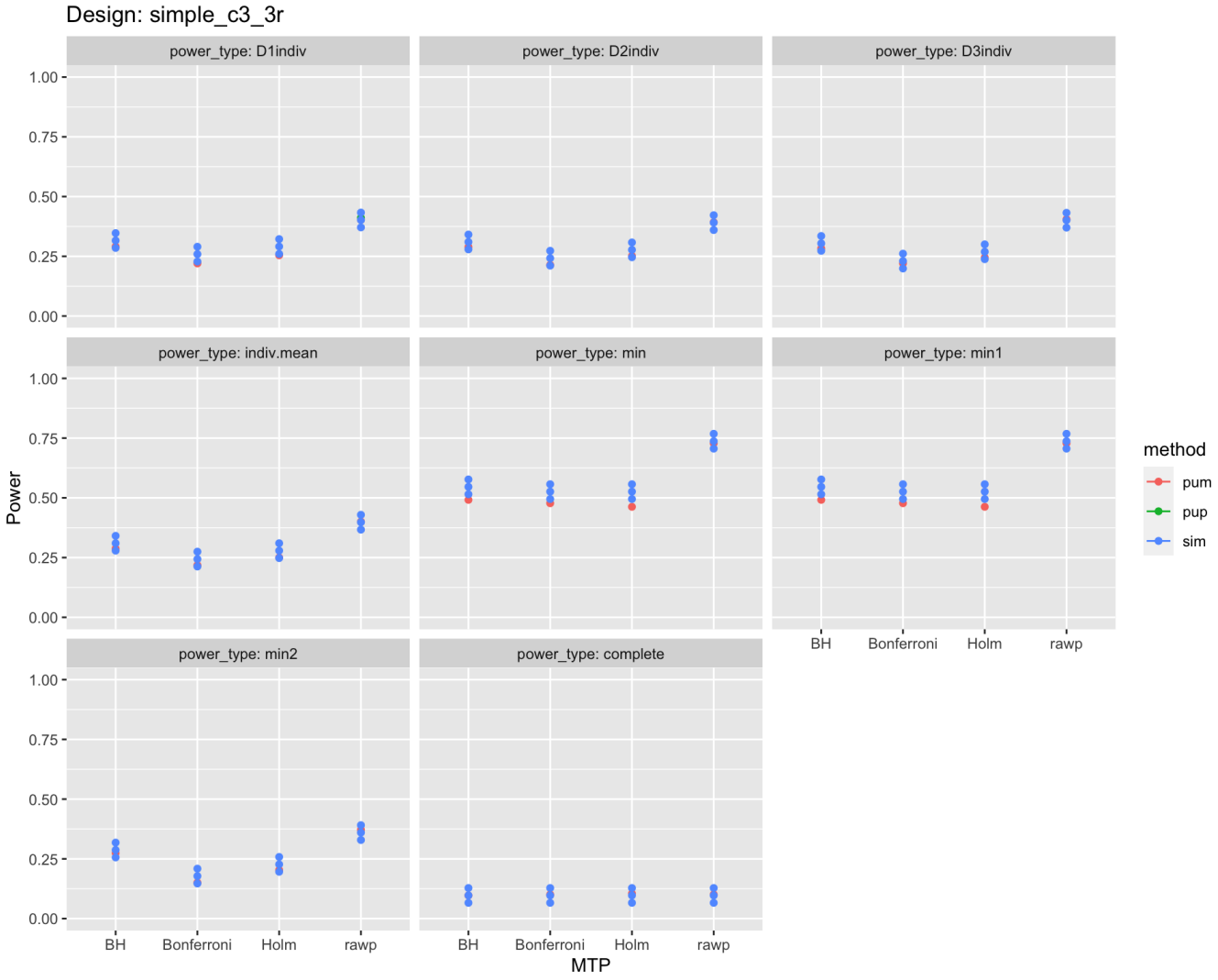


$R_1^2 = 0, 0, 0\ R_2^2 = 0, 0, 0\ R_3^2 = 0, 0, 0$

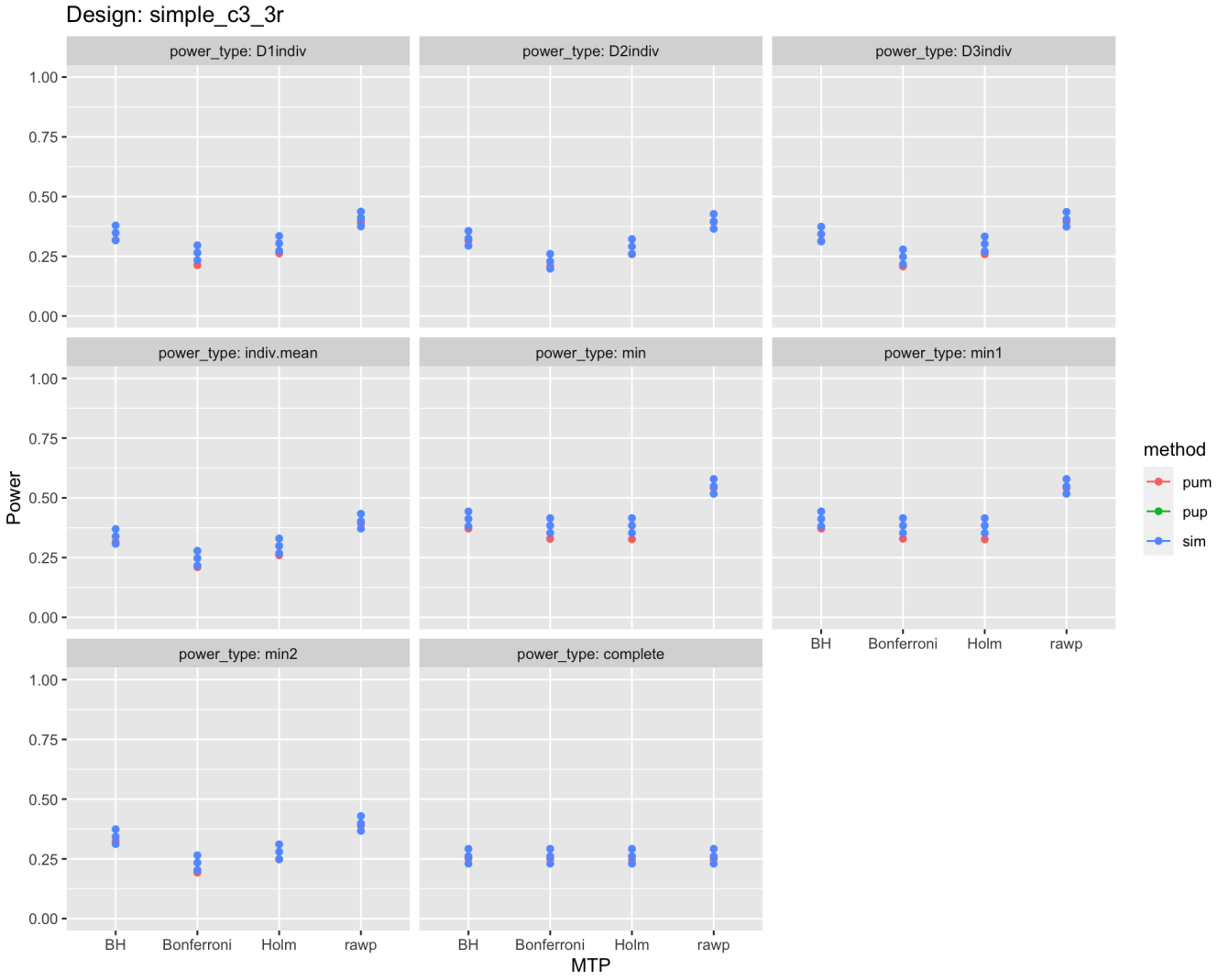


Varying rho

$\rho = 0.2$

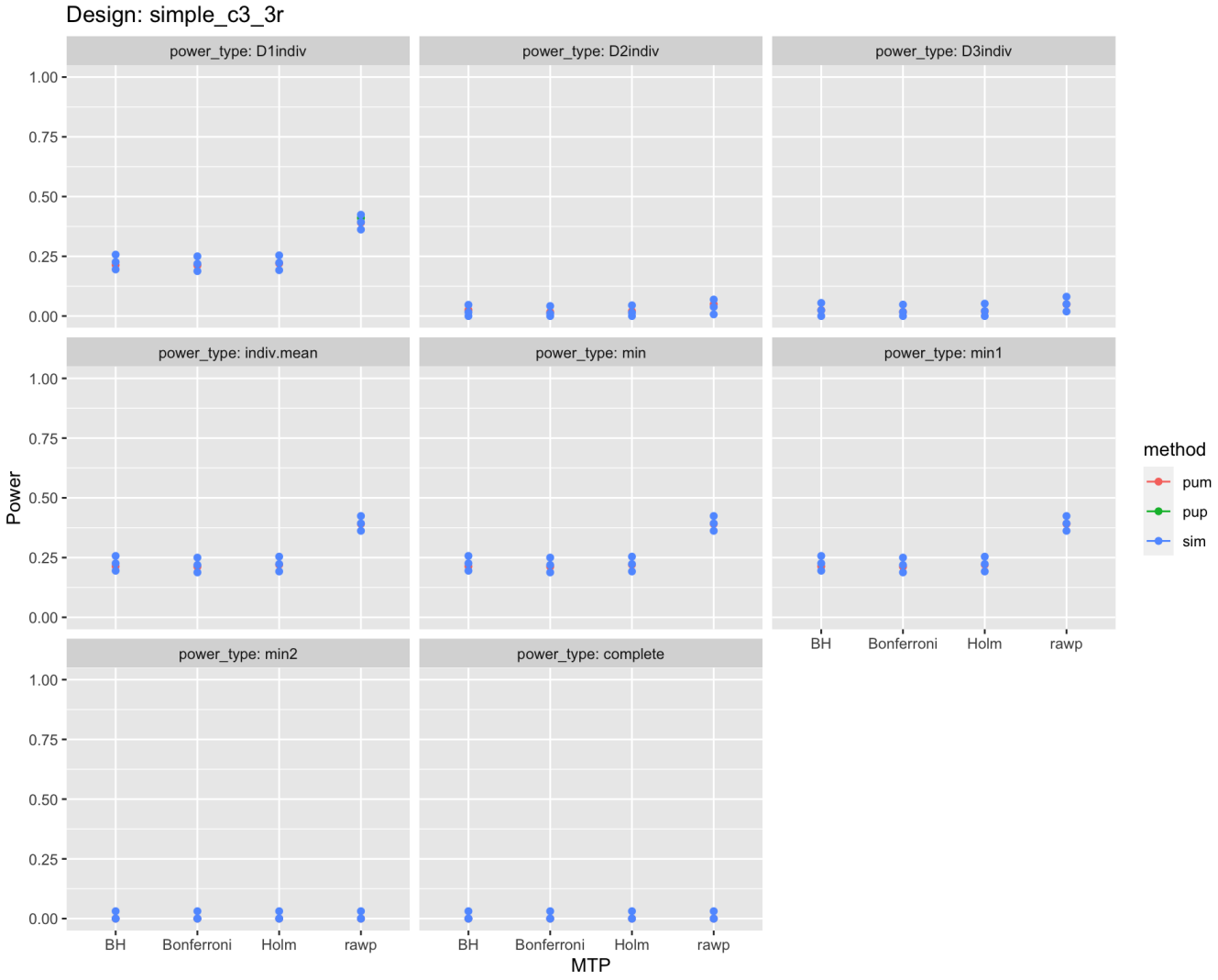

Design: simple_c3_3r
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
rawp
MTP
method
pum
pup
sim

$\rho = 0.8$



Varying true positives

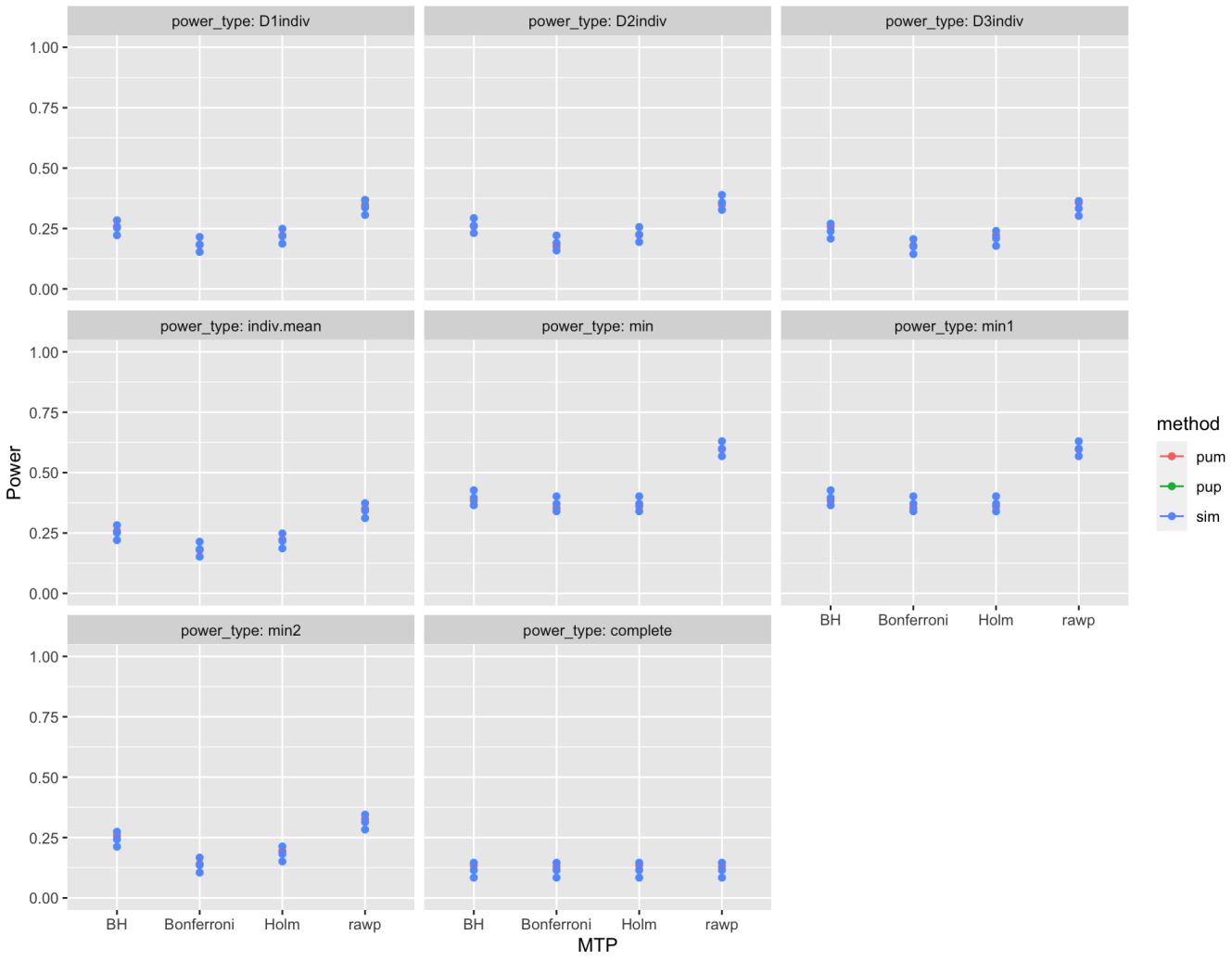
ATE (ES) = 0.25, 0, 0



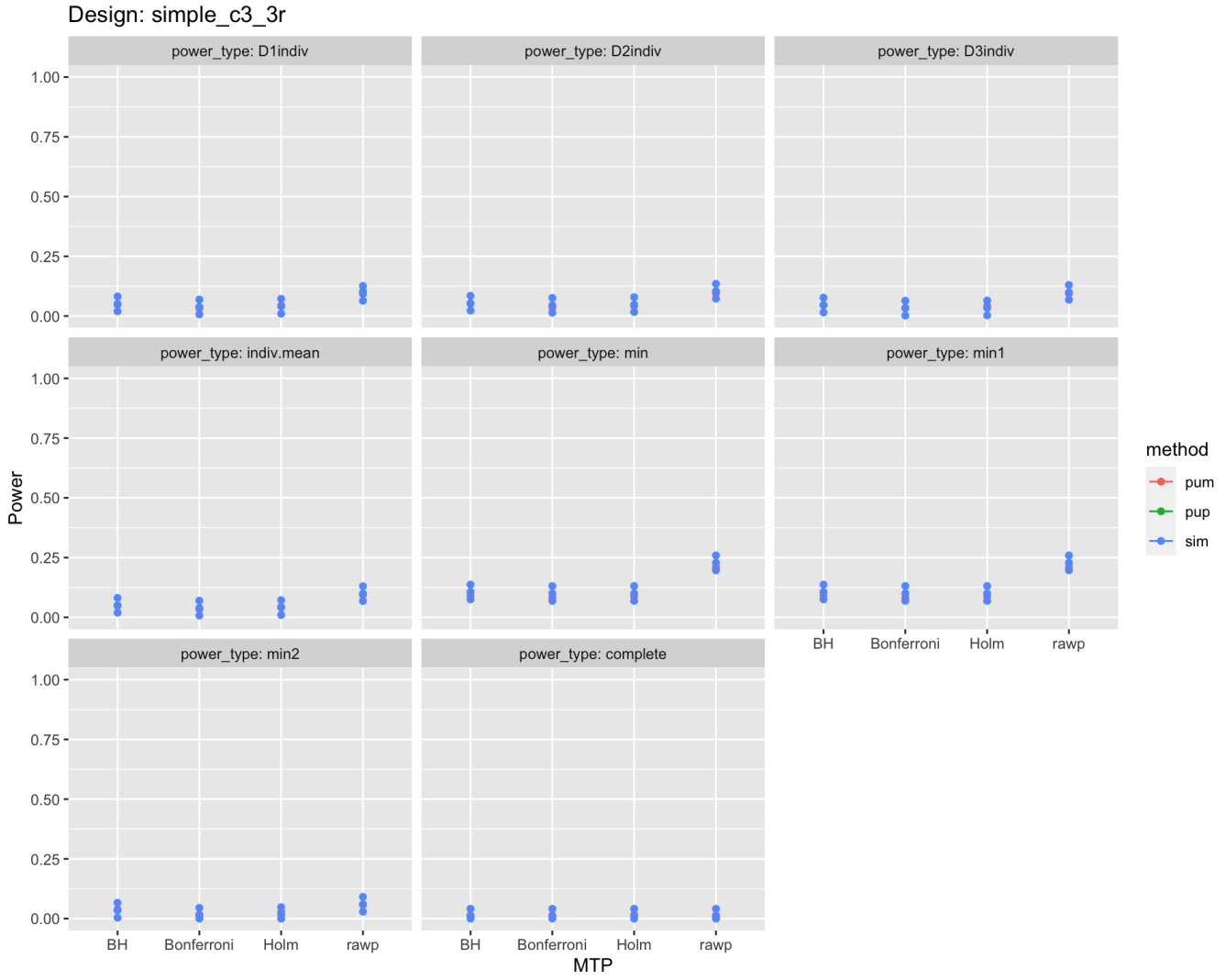
Varying ICC

ICC_2 = 0.7, 0.7, 0.7

Design: simple_c3_3r



ICC_3 = 0.7, 0.7, 0.7



MDES validation

```
##
##
## +------------+---------------+---------------+-------------+
## |    MTP     | Adjusted MDES | D1indiv Power | Target MDES |
## +============+===============+===============+=============+
## |    rawp    |     0.252     |      0.4      |    0.25     |
## +------------+---------------+---------------+-------------+
## | Bonferroni |     0.251     |     0.215     |    0.25     |
## +------------+---------------+---------------+-------------+
## |     BH     |     0.248     |     0.297     |    0.25     |
## +------------+---------------+---------------+-------------+
## |    Holm    |     0.248     |     0.254     |    0.25     |
## +------------+---------------+---------------+-------------+
##
## Table: simple_c3_3r
```

Sample size validation

```
##
##
## +------+-------------+-------------+---------------+--------------------+
## | MTP  | Sample type | Sample size | D1indiv power | Target sample size |
## +======+=============+=============+===============+====================+
## |  BH  |      K      |     20      |     0.292     |         20         |
## +------+-------------+-------------+---------------+--------------------+
## | Holm |      K      |     20      |     0.251     |         20         |
## +------+-------------+-------------+---------------+--------------------+
##
## Table: simple_c3_3r
```