Validate Power: d2.1_m2fcfr

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Contents

Design: Blocked RCT, with 2 levels, and randomization done at level 1 (individual level).

Models: Constant treatment effects, fixed treatment effects, and random treatment effects.

Default parameters:

- M = 3
- J = 20
- rho: $\rho = 0.5$
- ATE ES = 0.125, 0.125, 0.125
- R2.1: $R_1^2 = 0.1, 0.1, 0.1$

Parameters by model type:

- Omega: $\omega_2 = 0$ for constant effects, $\omega_2 = 0.1$ for fixed and random
- ICC: $\text{ICC}_2 = 0$ for constant and fixed effects, $\text{ICC}_2 = 0.2, 0.2, 0.2$ for random effects

Assumptions:

- Two-level design: $\text{ICC}_3 = 0$, $\omega_3 = 0$, $K = 1$

Power Validation

Base case

```
## NULL
```

```
## NULL
```

```
## NULL
```

Varying school size

$\bar{n} = 100$

```
## NULL
```

```
## NULL
```

```
## NULL
```

$\bar{n} = 75$

```
## NULL
```

```
## NULL
```

```
## NULL
```

Varying R2

$R_1^2 = 0.6, 0.6, 0.6$

```
## NULL
```

$R_2^2 = 0.6, 0.6, 0.6$

```
## NULL
```

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

```
## NULL
```

Varying rho

$\rho = 0.2$

```
## NULL
```

$\rho = 0.8$

```
## NULL
```

Varying true positives

ATE (ES) = 0.125, 0, 0

```
## NULL
```

Varying ICC

Note: we expect a discrepancy when ICC is not zero between powerup and pump.

$\text{ICC}_2 = 0.7, 0.7, 0.7$

```
## NULL
```

```
## NULL
```

```
## NULL
```

$\text{ICC}_2 = 0, 0, 0$

```
## NULL
## NULL
## NULL
```

Varying Omega

$\omega_2 = 0.8$

```
## NULL
## NULL
```

$\omega_2 = 0$

```
## NULL
## NULL
```

Kappa

$\kappa = 0.4$

```
## NULL
## NULL
## NULL
```

MDES validation

Sample size validation