

# BCPP Preliminary Analysis

Melody Owen

2025-05-30

## Frequency Table

```
tally(Y_ik ~ VMMC, data = vmmcDat) # For all individuals
```

```
##      VMMC
## Y_ik Female   No   Yes <NA>
##    0   5080 2135   984   205
##    1    119    3     6    19
```

```
tally(Y_ik ~ VMMC, data = filter(vmmcDat, gender == "Male"))
```

```
##      VMMC
## Y_ik   No   Yes <NA>
##    0 2135   984   205
##    1    3     6    19
```

```
tally(Y_ik ~ gender, data = vmmcDat)
```

```
##      gender
## Y_ik Female Male
##    0   5080 3324
##    1    119   28
```

## Modeling $Y \sim \text{VMMC}$

Include men only in the model.

$$\text{logit}(Y_{ik}) = \beta_0 + \beta_1 \times \text{VMMC}$$

Model	Term	OR [95% CI]	p-value	ICC
GLM	VMMCYes	4.339 [1.142, 20.596]	0.04	
GLMM	VMMCYes	5.243 [1.249, 22.016]	0.02	0.45
GEE	VMMCYes	4.538 [1.148, 17.94]	0.03	0.00

Table 1: Model Summary for Y Regressed on VMMC

## Modeling $Y \sim T + \text{VMMC}$

Include men only in the model.

$$\text{logit}(Y_{ik}) = \beta_0 + \beta_1 \times \text{VMMC} + \beta_2 \times T_k$$

Model	Term	OR [95% CI]	p-value	ICC
GLM	VMMCYes	5.139 [1.342, 24.532]	0.02	
GLM	T_k	0.226 [0.034, 0.948]	0.07	
GLMM	VMMCYes	5.615 [1.354, 23.283]	0.02	0.30
GLMM	T_k	0.216 [0.032, 1.46]	0.12	0.30
GEE	VMMCYes	5.139 [1.191, 22.181]	0.03	0.00
GEE	T_k	0.226 [0.045, 1.144]	0.07	0.00

Table 2: Model Summary for Y Regressed on VMMC + T

## Modeling $Y \sim Z\_1$

Include men only in the model.

$$\text{logit}(Y_{ik}) = \beta_0 + \beta_1 \times Z_k^{(1)}$$

Model	Term	OR [95% CI]	p-value	ICC
GLM	Z1_k	0.007 [0, 1.028]	0.06	
GLMM	Z1_k	0.006 [0, 2.648]	0.10	0.09
GEE	Z1_k	0 [0, 19.639]	0.15	0.00

Table 3: Model Summary for Y Regressed on Z1

## Modeling $Y \sim Z\_1 + T\_k$

Include men only in the model.

$$\text{logit}(Y_{ik}) = \beta_0 + \beta_1 \times Z_k^{(1)} + \beta_2 \times T_k$$

Model	Term	OR [95% CI]	p-value	ICC
GLM	Z1_k	0.101 [0, 41.665]	0.47	
GLM	T_k	0.491 [0.174, 1.291]	0.16	
GLMM	Z1_k	0.106 [0, 151.581]	0.55	0.07
GLMM	T_k	0.488 [0.159, 1.499]	0.21	0.07
GEE	Z1_k	0.006 [0, 331.796]	0.36	0.00
GEE	T_k	0.43 [0.101, 1.824]	0.25	0.00

Table 4: Model Summary for Y Regressed on Z1 + T

## Modeling $Y \sim T\_k$

Include men only in the model.

$$\text{logit}(Y_{ik}) = \beta_0 + \beta_1 \times T_k$$

Model	Term	OR [95% CI]	p-value	ICC
GLM	T_k	0.399 [0.165, 0.875]	0.03	
GLMM	T_k	0.396 [0.159, 0.985]	0.05	0.07
GEE	T_k	0.272 [0.058, 1.277]	0.10	0.00

Table 5: Model Summary for Y Regressed on Z1 + T