BCPP Preliminary Analysis

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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
```

There are 990 (12%) men who are VMMC, and there are 1537 (18%) men who are circumcised (but not necessarily VMMC).

Modeling Y ~ VMMC

Include men only in the model.

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

```
## Warning in checkConv(attr(opt, "derivs"), opt$par, ctrl = control$checkConv, :
## Model failed to converge with max|grad| = 0.0299222 (tol = 0.002, component 1)
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
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```

Model	Term	OR [95% CI]	p-value	ICC
GLM	VMMCYes	104657335.044 [0, NA]	0.99	
GLMM	VMMCYes	1750583168325.34 [1741957124138.84, 1759251928051.31]	0.00	0.82
GEE	VMMCYes	Inf [Inf, Inf]	0.04	0.01

Table 1: Model Summary for Y Regressed on VMMC

Modeling Y ~ T + VMMC

Include men only in the model.

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

```
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```

Model	Term	OR [95% CI]	p-value	ICC
GLM	VMMCYes	121827439.023 [0, NA]	0.99	
GLM	T_k	0.135 [0.007, 0.843]	0.07	
GLMM	VMMCYes	42338013529175.9 [0, 1.09435502814425e+100]	0.76	0.50
GLMM	T_k	0.116 [0.006, 2.108]	0.14	0.50
GEE	VMMCYes	Inf [Inf, Inf]	0.00	0.01
GEE	T_k	0 [0, 0]	0.00	0.01

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

Modeling Y ~ Z_1

Include men only in the model.

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

Model	Term	OR [95% CI]	p-value	ICC
GLM	Z1_k	0.001 [0, 26.682]	0.22	
GLMM	Z1_k	0.002 [0, 39258.793]	0.46	0.57
GEE	Z1_k	0 [0, 1421.695]	0.31	0.00

Table 3: Model Summary for Y Regressed on Z1

Modeling Y ~ Z_1 + T_k

Include men only in the model.

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

Model	Term	OR [95% CI]	p-value	ICC
GLM	Z1_k	0.078 [0, 30035.309]	0.71	
GLM	T_k	0.245 [0.011, 2.288]	0.27	
GLMM	Z1_k	0.894 [0, 549145935.73]	0.99	0.47
GLMM	T_k	0.191 [0.005, 7.232]	0.37	0.47
GEE	Z1_k	0.063 [0, 41700.718]	0.69	0.00
GEE	T_k	0.236 [0.057, 0.975]	0.05	0.00

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

Modeling Y ~ T_k

Include men only in the model.

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

Model	Term	OR [95% CI]	p-value	ICC
GLM	T_k	0.193 [0.01, 1.2]	0.13	
GLMM	T_k	0.188 [0.012, 2.963]	0.23	0.47
GEE	T_k	0.179 [0.021, 1.516]	0.12	0.00

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