**Stepped wedge analysis of individual-level PEER data**

Regressions generally follow the form:

* Indicator variable for whether the person was getting the intervention
* Fixed effects for cohort (4 cohorts total)
* Random effect for facility
* Sometimes adjusts for patient age, if we expect it to explain some variation in the outcome

**Model 1**: Time from sample collection to receiving PCR result – Poisson

Formula: dias\_colheita\_entrega\_pcr1 ~ intervencao + coorte + idade + (1 | US)

* Some facilities (e.g. Munhava) have PCT facilities on-site, so the turnaround time was 0 days
* Limited the dataset to include only observations with at least 3 days for turnaround time

Effect of the intervention:

* Rate ratio = exp(0.029260) = 1.029692
* p-value = 0.466

**Model 2:** Time from birth to starting CPP – negative binomial

Formula: dias\_nascimento\_cpp ~ intervencao + coorte + idade + (1 | US)

* Used only observations with >=0 and <90 days

Effect of the intervention:

* Rate ratio = exp(0.26771) = 1.31 (95% CI: 0.452, 3.78)
* p-value = 0.621

**Model 3:** Time from starting CPP to starting CCR – negative binomial

Formula: dias\_cpp\_ccr ~ intervencao + coorte + idade + (1 | US)

* Used only observations with >=0 and <60 days

Effect of the intervention:

* Rate ratio = exp(-0.66012) = 0.517 (95% CI: 0.293, 0.91)
* p-value = 0.0223

**Model 4:** Getting PCR result and start TARV on the same day – logistic regression

Formula: same\_day ~ intervencao + coorte + (1 | US)

* Excluded those that got TDR tests

Effect of the intervention:

* Odds ratio = exp(1.6331) = 5.12 (95% CI: 1.63, 16)
* p-value = 0.00506

**Model 5:** Whether or not did fourth TARV pick-up

Formula: lev4\_dichot ~ intervencao + idade + coorte + (1 | US)

Effect of the intervention:

* Odds ratio = exp(0.85140) = 2.34 (95% CI: 0.611, 8.99)
* p-value = 0.2145

**Appendix**

Model 1

## Generalized linear mixed model fit by maximum likelihood (Laplace

## Approximation) [glmerMod]

## Family: poisson ( log )

## Formula: dias\_colheita\_entrega\_pcr1 ~ intervencao + coorte + idade + (1 |

## US)

## Data: filter(df2, dias\_colheita\_entrega\_pcr1 > 3)

##

## Fixed effects:

## Estimate Std. Error z value Pr(>|z|)

## (Intercept) 4.078964 0.132639 30.752 < 2e-16 \*\*\*

## intervencao 0.029260 0.040096 0.730 0.466

## coorte1a 0.537288 0.053783 9.990 < 2e-16 \*\*\*

## coorte2a 0.307123 0.052455 5.855 4.77e-09 \*\*\*

## coorte3a -0.034512 0.060238 -0.573 0.567

## idade 0.055505 0.003002 18.490 < 2e-16 \*\*\*

## ---

## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Model 2

*# nascimento --> cpp*

*# Time from birth to starting CPP*

## Generalized linear mixed model fit by maximum likelihood (Laplace

## Approximation) [glmerMod]

## Family: Negative Binomial(1.5162) ( log )

## Formula: dias\_nascimento\_cpp ~ intervencao + coorte + idade + (1 | US)

## Data: filter(df2, dias\_nascimento\_cpp >= 0 & dias\_nascimento\_cpp <

## 90)

##

## AIC BIC logLik deviance df.resid

## 326.9 342.5 -155.4 310.9 44

##

## Scaled residuals:

## Min 1Q Median 3Q Max

## -1.1159 -0.7177 -0.3057 0.0973 3.8341

##

## Random effects:

## Groups Name Variance Std.Dev.

## US (Intercept) 0.1859 0.4311

## Number of obs: 52, groups: US, 6

##

## Fixed effects:

## Estimate Std. Error z value Pr(>|z|)

## (Intercept) 2.12365 0.49948 4.252 2.12e-05 \*\*\*

## intervencao 0.26771 0.54206 0.494 0.621

## coorte1a -0.30773 0.71415 -0.431 0.667

## coorte2a -0.31986 0.63446 -0.504 0.614

## coorte3a -0.81226 0.73678 -1.102 0.270

## idade 0.03190 0.03672 0.869 0.385

## ---

## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Exponentiated 'intervencao': 1.31 (95% CI: 0.452, 3.78)

Model 3

*# cpp --> ccr*

*# Time from starting CPP to starting CCR*

## Generalized linear mixed model fit by maximum likelihood (Laplace

## Approximation) [glmerMod]

## Family: Negative Binomial(6.2495) ( log )

## Formula: dias\_cpp\_ccr ~ intervencao + coorte + idade + (1 | US)

## Data: filter(df2, dias\_cpp\_ccr >= 0 & dias\_cpp\_ccr < 60)

##

##

## Fixed effects:

## Estimate Std. Error z value Pr(>|z|)

## (Intercept) 3.59146 0.34064 10.543 <2e-16 \*\*\*

## intervencao -0.66012 0.28894 -2.285 0.0223 \*

## coorte1a -0.13879 0.40825 -0.340 0.7339

## coorte2a 0.03585 0.37876 0.095 0.9246

## coorte3a 0.44010 0.43151 1.020 0.3078

## idade -0.03738 0.02192 -1.706 0.0880 .

## ---

## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

##

## Exponentiated 'intervencao': 0.517 (95% CI: 0.293, 0.91)

Model 4

*# outcome: getting PCR result and start TARV on the same day*

*# -- exclude TDR*

*# Result: Compared to the control group, children in CCR receiving the intervention were*

*# more likely to start TARV on the same day that they received their*

*# PCR result (OR = 5.12 [95% CI: 1.63, 16]).*

## Generalized linear mixed model fit by maximum likelihood (Laplace

## Approximation) [glmerMod]

## Family: binomial ( logit )

## Formula: same\_day ~ intervencao + coorte + (1 | US)

## Data: df2\_no\_tdr

##

## Fixed effects:

## Estimate Std. Error z value Pr(>|z|)

## (Intercept) 0.8473 0.4879 1.736 0.08248 .

## intervencao 1.6331 0.5826 2.803 0.00506 \*\*

## coorte1a -0.7543 0.7387 -1.021 0.30717

## coorte2a -1.1853 0.6930 -1.710 0.08719 .

## coorte3a -1.9338 0.8058 -2.400 0.01640 \*

## ---

## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

##

## Correlation of Fixed Effects:

## (Intr) intrvn coort1 coort2

## intervencao 0.000

## coorte1a -0.661 -0.149

## coorte2a -0.704 -0.560 0.549

## coorte3a -0.606 -0.723 0.508 0.831

get\_ci(time\_fit8, variable = "intervencao", exponentiate = TRUE)

##

## Exponentiated 'intervencao': 5.12 (95% CI: 1.63, 16)

Model 5

*# logistic regression, whether or not did fourth pick-up*

Generalized linear mixed model fit by maximum likelihood

(Laplace Approximation) [glmerMod]

Family: binomial ( logit )

Formula:

lev4\_dichot ~ intervencao + idade + coorte + (1 | US)

Data: df2

Fixed effects:

Estimate Std. Error z value Pr(>|z|)

(Intercept) 2.04333 0.72644 2.813 0.00491 \*\*

intervencao 0.85140 0.68591 1.241 0.21450

idade -0.07974 0.04449 -1.792 0.07305 .

coorte1a -0.05663 0.87951 -0.064 0.94867

coorte2a -0.76918 0.81803 -0.940 0.34707

coorte3a -1.23286 0.97648 -1.263 0.20675

---

Signif. codes:

0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:

(Intr) intrvn idade coort1 coort2

intervencao 0.009

idade -0.455 0.045

coorte1a -0.557 -0.180 0.058

coorte2a -0.584 -0.586 -0.053 0.566

coorte3a -0.558 -0.724 0.066 0.527 0.855

> get\_ci(fit1, variable = "intervencao", exponentiate = TRUE)

Exponentiated 'intervencao': 2.34 (95% CI: 0.611, 8.99)