

Strain-sharing prediction

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Calculate R^2 for all relationships

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: strain_sharing_rate ~ gender.mm + gender.mf + indigenous.both +
##   indigenous.one + religion.same + age_difference_abs + average_diet +
##   different_diet + average_bristol + different_bristol + watersource_same +
##   same_usage_painkillers + same_usage_antibiotics + same_usage_antidiarrheal +
##   same_usage_antiparasite + same_usage_vitamins + same_usage_zinc +
##   same_usage_antifungal + same_usage_antihypertensives + same_usage_antidiabetics +
##   same_usage_antiacids + same_usage_laxatives + average_age +
##   wealth_difference_abs + average_wealth + education_difference_abs +
##   average_education + household_same + related + (1 | village_code_w3)
## Data: Downsamp_all
##
## REML criterion at convergence: 42758.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.2307 -0.5890 -0.1183  0.4382 16.6300
##
## Random effects:
##   Groups             Name             Variance Std.Dev.
## village_code_w3 (Intercept)  2.294      1.515
## Residual                    29.182      5.402
## Number of obs: 6870, groups:  village_code_w3, 18
##
## Fixed effects:
##
##              Estimate Std. Error    df t value
## (Intercept)    8.793e+00  2.583e+00 5.932e+03  3.404
## gender.mmTRUE  -6.378e-01  2.012e-01 6.833e+03 -3.170
## gender.mfTRUE  -1.712e-01  1.500e-01 6.830e+03 -1.142
## indigenous.bothTRUE  6.676e-01  2.868e-01 4.896e+03  2.327
## indigenous.oneTRUE  3.161e-01  2.224e-01 5.627e+03  1.421
## religion.sameTRUE  2.051e-01  1.443e-01 6.835e+03  1.421
## age_difference_abs  2.156e-02  5.393e-03 6.831e+03  3.998
## average_diet    -3.551e-02  4.022e-01 6.825e+03 -0.088
## different_diet   3.914e-02  7.904e-02 6.831e+03  0.495
## average_bristol  4.193e-01  4.187e-01 6.829e+03  1.001
## different_bristol  1.734e-02  5.649e-02 6.836e+03  0.307
## watersource_sameTRUE  6.652e-02  1.643e-01 6.831e+03  0.405
```

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## same_usage_painkillersTRUE      1.157e-01  1.316e-01  6.828e+03  0.879
## same_usage_antibioticsTRUE      2.455e-01  1.682e-01  6.839e+03  1.459
## same_usage_antidiarrhealTRUE   -2.245e-02  2.664e-01  6.837e+03 -0.084
## same_usage_antiparasiteTRUE     7.286e-01  2.991e-01  6.837e+03  2.436
## same_usage_vitaminsTRUE        -8.913e-03  1.520e-01  6.839e+03 -0.059
## same_usage_zincTRUE            -1.430e-01  2.231e+00  6.831e+03 -0.064
## same_usage_antifungalTRUE       -1.661e-01  4.471e-01  6.831e+03 -0.371
## same_usage_antihypertensivesTRUE 7.916e-02  2.703e-01  6.840e+03  0.293
## same_usage_antidiabeticsTRUE    9.333e-02  3.374e-01  6.840e+03  0.277
## same_usage_antiacidsTRUE        -5.294e-01  3.207e-01  6.839e+03 -1.651
## same_usage_laxativesTRUE        -4.661e-01  9.261e-01  6.827e+03 -0.503
## average_age                    -3.069e-02  7.051e-03  6.790e+03 -4.352
## wealth_difference_abs           -2.772e-01  6.707e-02  6.836e+03 -4.133
## average_wealth                  -5.164e-01  7.693e-02  6.654e+03 -6.713
## education_difference_abs        -3.825e-02  3.445e-02  6.831e+03 -1.110
## average_education               -1.396e-01  4.687e-02  6.815e+03 -2.980
## household_sameTRUE              7.155e+00  2.486e-01  6.831e+03 28.783
## related                        2.912e+00  1.502e-01  6.827e+03 19.382
##                                Pr(>|t|)
## (Intercept)                    0.000668 ***
## gender.mmTRUE                   0.001530 **
## gender.mfTRUE                   0.253579
## indigenous.bothTRUE             0.019988 *
## indigenous.oneTRUE              0.155378
## religion.sameTRUE               0.155218
## age_difference_abs              6.44e-05 ***
## average_diet                    0.929658
## different_diet                  0.620508
## average_bristol                 0.316644
## different_bristol               0.758801
## watersource_sameTRUE            0.685558
## same_usage_painkillersTRUE      0.379427
## same_usage_antibioticsTRUE      0.144478
## same_usage_antidiarrhealTRUE    0.932833
## same_usage_antiparasiteTRUE     0.014864 *
## same_usage_vitaminsTRUE         0.953255
## same_usage_zincTRUE             0.948889
## same_usage_antifungalTRUE       0.710368
## same_usage_antihypertensivesTRUE 0.769649
## same_usage_antidiabeticsTRUE    0.782092
## same_usage_antiacidsTRUE        0.098841 .
## same_usage_laxativesTRUE        0.614753
## average_age                     1.37e-05 ***
## wealth_difference_abs            3.63e-05 ***
## average_wealth                  2.06e-11 ***
## education_difference_abs         0.266902
## average_education               0.002897 **
## household_sameTRUE               < 2e-16 ***
## related                         < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
##
```

```
## Correlation matrix not shown by default, as p = 30 > 12.
```

```
## Use print(x, correlation=TRUE) or
##      vcov(x)          if you need it
```

```
r2glmm::r2beta(llm_all_kin_for2, method = 'nsj')
```

##	Effect	Rsqr	upper.CL	lower.CL
## 1	Model	0.259	0.278	0.245
## 29	household_same	0.102	0.115	0.089
## 30	related	0.049	0.059	0.039
## 26	average_wealth	0.007	0.012	0.004
## 24	average_age	0.003	0.006	0.001
## 25	wealth_difference_abs	0.002	0.005	0.001
## 7	age_difference_abs	0.002	0.005	0.001
## 4	indigenous.both	0.002	0.004	0.000
## 2	gender.mm	0.001	0.004	0.000
## 28	average_education	0.001	0.004	0.000
## 16	same_usage_antiparasite	0.001	0.003	0.000
## 5	indigenous.one	0.000	0.002	0.000
## 22	same_usage_antiacids	0.000	0.002	0.000
## 14	same_usage_antibiotics	0.000	0.002	0.000
## 6	religion.same	0.000	0.002	0.000
## 3	gender.mf	0.000	0.001	0.000
## 27	education_difference_abs	0.000	0.001	0.000
## 10	average_bristol	0.000	0.001	0.000
## 13	same_usage_painkillers	0.000	0.001	0.000
## 23	same_usage_laxatives	0.000	0.001	0.000
## 9	different_diet	0.000	0.001	0.000
## 12	watersource_same	0.000	0.001	0.000
## 19	same_usage_antifungal	0.000	0.001	0.000
## 11	different_bristol	0.000	0.001	0.000
## 20	same_usage_antihypertensives	0.000	0.001	0.000
## 21	same_usage_antidiabetics	0.000	0.001	0.000
## 8	average_diet	0.000	0.001	0.000
## 15	same_usage_antidiarrheal	0.000	0.001	0.000
## 18	same_usage_zinc	0.000	0.001	0.000
## 17	same_usage_vitamins	0.000	0.001	0.000

Calculate R² for non-kin relationships

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: strain_sharing_rate ~ gender.mm + gender.mf + indigenous.both +
##   indigenous.one + religion.same + age_difference_abs + average_diet +
##   different_diet + average_bristol + different_bristol + watersource_same +
##   same_usage_painkillers + same_usage_antibiotics + same_usage_antidiarrheal +
##   same_usage_antiparasite + same_usage_vitamins + same_usage_zinc +
##   same_usage_antifungal + same_usage_antihypertensives + same_usage_antidiabetics +
##   same_usage_antiacids + same_usage_laxatives + average_age +
##   wealth_difference_abs + average_wealth + education_difference_abs +
##   average_education + household_same + related + (1 | village_code_w3)
## Data: Downsamp_all_nkh
##
## REML criterion at convergence: 31322.1
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.6325 -0.6513 -0.1255  0.4932 12.6838
##
## Random effects:
##   Groups             Name                Variance Std.Dev.
##   village_code_w3 (Intercept)  2.213      1.488
##   Residual                  20.365      4.513
## Number of obs: 5338, groups:  village_code_w3, 18
##
## Fixed effects:
##              Estimate Std. Error      df t value
## (Intercept)    6.298e+00  2.650e+00  4.879e+03  2.377
## gender.mmTRUE   -8.177e-01  1.837e-01  5.298e+03 -4.450
## gender.mfTRUE   -7.943e-02  1.418e-01  5.295e+03 -0.560
## indigenous.bothTRUE  8.922e-01  2.739e-01  4.111e+03  3.257
## indigenous.oneTRUE  7.996e-01  2.143e-01  4.609e+03  3.731
## religion.sameTRUE -3.168e-02  1.376e-01  5.305e+03 -0.230
## age_difference_abs  3.155e-02  5.159e-03  5.297e+03  6.117
## average_diet     -1.301e-01  3.829e-01  5.293e+03 -0.340
## different_diet    -8.278e-02  7.547e-02  5.299e+03 -1.097
## average_bristol   8.564e-01  3.970e-01  5.297e+03  2.157
## different_bristol  3.014e-02  5.341e-02  5.301e+03  0.564
## watersource_sameTRUE -1.120e-03  1.473e-01  5.307e+03 -0.008
## same_usage_painkillersTRUE -4.167e-03  1.249e-01  5.294e+03 -0.033
## same_usage_antibioticsTRUE -2.353e-02  1.597e-01  5.305e+03 -0.147
## same_usage_antidiarrhealTRUE  3.063e-02  2.577e-01  5.302e+03  0.119
## same_usage_antiparasiteTRUE  1.026e+00  2.889e-01  5.301e+03  3.550
## same_usage_vitaminsTRUE  3.664e-01  1.449e-01  5.306e+03  2.529
## same_usage_zincTRUE  9.597e-01  2.277e+00  5.296e+03  0.421
## same_usage_antifungalTRUE -5.900e-01  4.238e-01  5.296e+03 -1.392
## same_usage_antihypertensivesTRUE  5.066e-01  2.513e-01  5.307e+03  2.016
## same_usage_antidiabeticsTRUE  1.765e-01  3.200e-01  5.305e+03  0.552
## same_usage_antiacidsTRUE -5.775e-01  2.914e-01  5.304e+03 -1.982
## same_usage_laxativesTRUE -3.082e-01  9.771e-01  5.306e+03 -0.315
## average_age     -3.446e-02  6.650e-03  5.290e+03 -5.181
## wealth_difference_abs -2.991e-01  5.981e-02  5.303e+03 -5.000
```

```

## average_wealth -3.008e-01 7.605e-02 5.219e+03 -3.956
## education_difference_abs -3.565e-02 3.289e-02 5.295e+03 -1.084
## average_education -6.915e-02 4.454e-02 5.302e+03 -1.553
## household_sameTRUE 8.132e+00 2.274e+00 5.302e+03 3.576
## related 3.134e+00 1.338e-01 5.294e+03 23.414
## Pr(>|t|)
## (Intercept) 0.017489 *
## gender.mmTRUE 8.75e-06 ***
## gender.mfTRUE 0.575515
## indigenous.bothTRUE 0.001136 **
## indigenous.oneTRUE 0.000193 ***
## religion.sameTRUE 0.817999
## age_difference_abs 1.02e-09 ***
## average_diet 0.734005
## different_diet 0.272699
## average_bristol 0.031014 *
## different_bristol 0.572578
## watersource_sameTRUE 0.993937
## same_usage_painkillersTRUE 0.973377
## same_usage_antibioticsTRUE 0.882885
## same_usage_antidiarrhealTRUE 0.905388
## same_usage_antiparasiteTRUE 0.000388 ***
## same_usage_vitaminsTRUE 0.011457 *
## same_usage_zincTRUE 0.673473
## same_usage_antifungalTRUE 0.163917
## same_usage_antihypertensivesTRUE 0.043820 *
## same_usage_antidiabeticsTRUE 0.581173
## same_usage_antiacidsTRUE 0.047556 *
## same_usage_laxativesTRUE 0.752479
## average_age 2.29e-07 ***
## wealth_difference_abs 5.91e-07 ***
## average_wealth 7.74e-05 ***
## education_difference_abs 0.278461
## average_education 0.120593
## household_sameTRUE 0.000352 ***
## related < 2e-16 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
## Correlation matrix not shown by default, as p = 30 > 12.
## Use print(x, correlation=TRUE) or
## vcov(x) if you need it

```

```
r2glmm::r2beta(llm_non_kin_for2, method = 'nsj')
```

```

##          Effect    Rsq upper.CL lower.CL
## 1          Model 0.120   0.140   0.109
## 30         related 0.085   0.100   0.072
## 7    age_difference_abs 0.006   0.011   0.003
## 24         average_age 0.005   0.010   0.002
## 25    wealth_difference_abs 0.004   0.009   0.002
## 4      indigenous.both 0.004   0.008   0.001

```

## 5	indigenous.one	0.004	0.008	0.001
## 2	gender.mm	0.003	0.007	0.001
## 26	average_wealth	0.003	0.007	0.001
## 29	household_same	0.002	0.005	0.000
## 16	same_usage_antiparasite	0.002	0.005	0.000
## 17	same_usage_vitamins	0.001	0.004	0.000
## 10	average_bristol	0.001	0.003	0.000
## 20	same_usage_antihypertensives	0.001	0.003	0.000
## 22	same_usage_antiacids	0.001	0.003	0.000
## 28	average_education	0.000	0.002	0.000
## 19	same_usage_antifungal	0.000	0.002	0.000
## 9	different_diet	0.000	0.002	0.000
## 27	education_difference_abs	0.000	0.002	0.000
## 11	different_bristol	0.000	0.001	0.000
## 3	gender.mf	0.000	0.001	0.000
## 21	same_usage_antidiabetics	0.000	0.001	0.000
## 18	same_usage_zinc	0.000	0.001	0.000
## 8	average_diet	0.000	0.001	0.000
## 23	same_usage_laxatives	0.000	0.001	0.000
## 6	religion.same	0.000	0.001	0.000
## 14	same_usage_antibiotics	0.000	0.001	0.000
## 15	same_usage_antidiarrheal	0.000	0.001	0.000
## 13	same_usage_painkillers	0.000	0.001	0.000
## 12	watersource_same	0.000	0.001	0.000